IBD

S712 Outstanding Research Award in the IBD Category

Benefits of High versus Low Dose Upadacitinib as Maintenance Treatment in Ulcerative Colitis Patients Who Were Responders to 8-week Induction with Upadacitinib: Results From the U-ACHIEVE Phase 3 Maintenance Trial

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Introduction: Evaluate the benefits of upadacitinib (UPA) 30mg (UPA30) vs 15mg (UPA15) once daily (QD) as maintenance treatment in patients (pts) with active ulcerative colitis (UC).
Methods: This post-hoc analysis included pts with clinical response after 8 wks of induction (16-wk induction responders were excluded) with UPA 45mg QD who were enrolled in U-ACHIEVE maintenance trial and re-randomized 1:1:1 to UPA15, UPA30, or placebo (PBO) QD for 52 wks. Clinical remission per Partial Adapted Mayo score were evaluated in subgroups of pts with mild (Adapted Mayo score < 5), moderate (Adapted Mayo score 5 to ≤ 7), or severe (Adapted Mayo score >7) UC at wks 0 and 52 of maintenance. For each UPA dose, area under the curve (AUC) analysis on proportion of pts in clinical remission per Partial Adapted Mayo score at wks 0, 4, 8, 12, 20, 28, 36, 44 and 52 of maintenance was used to calculate the number of wks pts were in clinical remission. To assess these benefits in the non-elder population, analysis was replicated for UPA doses in pts < 65 years.
Results: Data from 451 pts (UPA15, n=149; UPA30, n=148; PBO, n=154) were analyzed. At Wk 0 of maintenance, at least 91% of pts had mild disease and no pts had severe disease across treatment groups (Table). At the end of 52-wks maintenance, 19.7% more UPA30 pts were in lesser disease severity (10.5% and 9.2% more pts with mild and moderate disease, respectively) vs UPA15. Based on AUC analysis, PBO pts, UPA15 and UPA30 pts were in clinical remission for 15.8 (95% CI: 12.2, 19.5), 30.5 (95% CI: 26.4, 34.6), and 34.4 (95% CI: 30.5, 38.3) wks, respectively. UPA30 pts were in clinical remission for an additional 3.8 wks (26.9 days) over a year of maintenance vs UPA15. In pts < 65 years old (n=411), 26% more UPA30 pts were in lesser disease severity (14% and 12% more pts with mild and moderate disease, respectively) vs UPA15 and were in clinical remission for an additional 4.2 wks (29.3 days) over a year of maintenance vs UPA15.
Conclusion: After 52-wks of maintenance treatment with UPA 30mg QD, pts had less severe disease and were in clinical remission for approximately 1 additional month/year vs pts treated with UPA 15mg QD indicating clinical benefit of high dose UPA as maintenance treatment in UC.

Table 1. Patients with mild, moderate, and severe UC at Weeks 0 and 52 and weeks in clinical remission

Patients with mild, moderate, and severe UC at Weeks 0 and 52 and weeks in clinical remission								
		Week 0			Week 52[a]			Weeks in Clinical Remission[b]
n (%)	N	Mild	Moderate	Severe	Mild	Moderate	Severe	Mean (95% CI)
PBO	149	137 (92.0)	12 (8.1)	0	34 (22.8)	70 (47.0)	45 (30.2)	15.8 (12.2, 19.5)
UPA 15 mg	148	136 (91.9)	11 (7.4)	0	94 (63.5)	25 (16.9)	28 (18.9)	30.5 (26.4, 34.6)
UPA 30 mg	154	141 (91.6)	13 (8.4)	0	114 (74.0)	24 (15.6)	15 (9.7)	34.4 (30.5, 38.3)

[a]Patients with Adapted Mayo scores collected at or after initiation of UC-related rescue medications through the end of the maintenance study or who prematurely discontinued from the study were assumed to have Week 52 Adapted Mayo score return to baseline. Patients with missing data for reasons other than UC-related rescue medications or premature discontinuation were handled by last observation carried forward. Disease severity was defined by Adapted Mayo score: mild (Adapted Mayo < 5), moderate (Adapted Mayo 5 to ≤ 7), and severe (Adapted Mayo >7).
[b]Clinical remission was defined as Partial Adapted Mayo score ≤ 2 with no subscore >1.

S713

Induction and Maintenance Treatment with Risankizumab Leads to Symptomatic Relief in Patients With Moderate to Severe Crohn's Disease

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Introduction: Burdensome symptoms of Crohn's disease (CD) include abdominal pain (AP) and increased stool frequency (SF), and STRIDE II guidelines identify symptom relief as an important treatment goal. Risankizumab (RZB) was shown to be well-tolerated and superior to placebo (PBO) for inducing and maintaining clinical remission and endoscopic response in patients with moderate to severe CD. Here, the patient reported outcomes (PROs) of AP score (APS) and SF, and their correlation with endoscopic outcomes, were examined during induction and maintenance treatment.
Methods: Pooled data from the ADVANCE/MOTIVATE induction studies (PBO, RZB 600 mg intravenous (IV) groups), and data from the FORTIFY maintenance study (180 mg, 360 mg and RZB withdrawal/PBO subcutaneous [SC] groups), were examined for AP and SF clinical outcomes. Tetrachoric correlations were applied to determine the relationship between AP and SF and achievement of endoscopic endpoints (see Table footnotes for endpoint definitions) at Weeks (Wks) 12 and 52.
Results: Significantly more patients receiving 600 mg RZB IV versus (vs) PBO reported improvements from baseline (BL) in SF and APS at Wks 4, 8, and 12. Of patients reporting AP ≥ 1 at Induction BL, significantly more patients achieved APS $=0$ at Wks 8 and 12 with RZB vs PBO. Of patients reporting SF >2.8 at BL, a significantly greater proportion of patients achieved SF ≤ 1 at Wks 4, 8 and 12 with RZB vs PBO. During maintenance, AP remission rates at Wks 32 and 52 with were significantly greater with RZB SC (180 mg and 360 mg) vs withdrawal/PBO SC, while SF remission rates were significantly greater with 360 mg RZB SC vs RZB withdrawal/PBO SC at Wk 52. A significant difference in the complete resolution of symptoms, as measured by AP=0, SF$\leq$1, and AP=0 plus SF$\leq$1, was observed for patients receiving RZB 360 mg SC vs withdrawal (PBO SC). AP remission at Wk 12 was weakly correlated with endoscopic remission and ulcer-free endoscopy at Wk 12. Weak/moderate correlations of SF remission with endoscopic outcomes were observed at Wk 12. At Wk 52, moderate correlations were observed with endoscopic outcomes and AP and SF remission.
Conclusion: CD-related PROs improved with RZB induction therapy, and 360 mg SC RZB maintenance dosing was most effective for symptomatic remission and complete resolution of symptoms. Symptom improvements and endoscopic outcomes were moderately correlated, underscoring the importance of an objective measure to assess disease activity.

Table 1. Patient Reported Outcomes of Abdominal Pain Score (APS) and Stool Frequency (SF) during Induction and Maintenance Dosing with RZB (ITT#) (NRI-NC&)

Endpoint	ADVANCE + MOTIVATE					
	RZB 600 mg IV	PBO	RZB 600 mg IV	PBO	RZB 600 mg IV	PBO
	Wk 4		Wk 8		Wk 12	
Decrease in APS from BL	59.4 [54.3, 64.5]	71.7 [67.9, 75.6] P < 0.001	63.8 [58.9, 68.8]	75.9 [72.2, 79.6] P< 0.001	58.8 [53.8, 63.9]	76.9 [73.2, 80.5] P< 0.001
Decrease in SF from BL	65.7 [60.9, 70.6]	81.6 [78.3, 84.9] P< 0.001	63.5 [58.6, 68.5]	84.1 [80.9, 87.2] P< 0.001	58 [52.9, 63.1]	85.4 [82.4, 88.4] P< 0.001
AP =0 in patients with APS ≥1 at Baseline	2.6 [0.9, 4.3]	5.6 [3.6, 7.6] P= 0.052	3.2 [1.3, 5.0]	11.5 [8.7, 14.3] P< 0.001	6.4 [3.8, 8.9]	17.9 [14.5, 21.2] P<0.001
SF ≤1 in patients with SF >2.8 at Baseline	4.8 [2.5, 7.1]	9.8 [7.1, 12.5] P=0.004	6 [3.4, 8.5]	18.2 [14.7, 21.6] P<0.001	11.6 [8.2, 15.1]	26.1 [22.2, 30.0] P<0.001

Endpoint	FORTIFY														
	Withdrawal (PBO SC)	RZB 180 mg SC	RZB 360 mg SC	Withdrawal (PBO SC)	RZB 180 mg SC	RZB 360 mg SC	Withdrawal (PBO SC)	RZB 180 mg SC	RZB 360 mg SC	Withdrawal (PBO SC)	RZB 180 mg SC	RZB 360 mg SC	Withdrawal (PBO SC)	RZB 180 mg SC	RZB 360 mg SC
	Wk 8			Wk 16			Wk 24			Wk 32			Wk 52		
APS Remission (APS ≤1)	67.7 [60.5, 74.8]	72.6 [65.6, 79.6] P=0.413	75.9 [68.8, 82.9] P= 0.033	70.1 [63.1, 77.1]	65.6 [58.2, 73.0] P= 0.311	70.2 [62.7, 77.8] P= 0.743	61 [53.5, 68.4]	66.2 [58.8, 73.6] P= 0.306	68.1 [60.4, 75.8] P= 0.052	54.3 [46.6, 61.9]	66.2 [58.8, 73.6] P = 0.027	63.1 [55.2, 71.1] P= 0.035	46.3 [38.7, 54.0]	57.3 [49.6, 65.1] P= 0.027	55.3 [47.1, 63.5] P= 0.028
SF Remission (SF ≤2.8)	66.5 [59.2, 73.7]	68.2 [60.9, 75.4] P= 0.807	67.4 [59.6, 75.1] P= 0.420	64.6 [57.3, 72.0]	66.2 [58.8, 73.6] P = 0.783	67.4 [59.6, 75.1] P = 0.266	59.8 [52.3, 67.3]	59.9 [52.2, 67.5] P = 0.990	63.8 [55.9, 71.8] P = 0.154	57.3 [49.7, 64.9]	58.6 [50.9, 66.3] P= 0.881	58.2 [50.0, 66.3] P= 0.437	44.5 [36.9, 52.1]	51.6 [43.8, 59.4] P= 0.113	56 [3.6, 24.3] P= 0.008
AP =0													18.3 [12.4, 24.2]	30.6 [23.4, 37.8] P= 0.009	30.6 [23.4, 37.8] P= 0.009
SF ≤1													28.7 [21.7, 35.6]	35.7 [28.2, 43.2] P=0.081	39.0 [31.0, 47.1] P=0.006
AP =0 and SF ≤1													14.6 [9.2, 20.0]	21.7 [15.2, 28.1] P=0.092	23.4 [16.4, 30.4] P=0.021

BL = baseline; Wk = Week; Endoscopic remission = SES-CD ≤4 and at least 2-point reduction from baseline; Ulcer-free endoscopy = SES-CD ulcerated surface subscore =0 in patients with subscore ≥1 at baseline; #Intent-to-treat (ITT) population Includes randomized patients who (ADVANCE/MOTIVATE) received at least one dose of study drug during the 12-Week Induction Period, and had an SES-CD of ≥6 (≥4 for isolated ileal disease) or who (FORTIFY) received IV risankizumab for 12 weeks in the induction study and at least one dose of study drug in FORTIFY sub-study 1 and had an SES-CD of ≥6 (≥ 4 for isolated ileal disease) at baseline of induction. &Calculations were based on non-responder imputation with no special data handling for missing data due to COVID-19 pandemic. 95% CI and p-value for adjusted response rate difference compared to PBO calculated according to the Cochran-Mantel-Haenszel test adjusted for strata. AP and number of liquid/very soft stools were recorded in a daily diary.

S714

52-Week Risankizumab Subcutaneous Maintenance Dosing Is Efficacious and Well Tolerated in Patients With Moderate to Severe Crohn's Disease Who Had Delayed Response to 12-Weeks IV Risankizumab Induction

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Introduction: In patients with moderate to severe Crohn's disease (CD), the ADVANCE and MOTIVATE phase 3 induction studies showed intravenous (IV) risankizumab (RZB), an anti-p19 interleukin-23 inhibitor, to be superior to placebo (PBO) for achieving clinical and endoscopic endpoints at Week (Wk) 12.[1] Here, we evaluated the long-term efficacy and safety of RZB during the FORTIFY maintenance study in patients with delayed clinical response to IV RZB induction.
Methods: Patients who did not achieve clinical response (defined as ≥30% decrease in average daily stool frequency [SF] and/or ≥30% decrease in average daily abdominal pain score [APS], both not worse than baseline of induction) following 12-wks IV RZB (600 mg or 1200 mg) induction dosing, but who did achieve clinical response at Wk 24 following an additional 12-wks RZB subcutaneous (SC) dosing ("delayed responders") were examined. These patients continued on the same dose (RZB 180 mg SC [N = 30], RZB 360 mg SC [N = 33]) in the FORTIFY maintenance study and were analyzed for clinical and endoscopic improvements at Wk 52.
Results: At FORTIFY Wk 52, most delayed responders achieved clinical remission and response with 180 mg or 360 mg RZB SC (Table, see footnotes for endpoint definitions). In addition, patients receiving RZB SC (180 mg or 360 mg) also achieved endoscopic response (36.7%, 45.5%), endoscopic remission (40.0%, 42.4%), deep remission (40.0%, 39.4%), ulcer free endoscopy (27.6%, 24.2%), and the combined endpoint of SF/APS clinical remission + endoscopic response (23.3%, 36.4%). Moreover, a dose-response trend was observed, with numerically higher response rates observed with RZB 360 mg SC relative to 180 mg SC for most outcomes, including clinical remission (CDAI and SF/APS), CDAI clinical response, enhanced clinical response, endoscopic response, endoscopic remission, and the composite endpoint of

SF/APS clinical remission + endoscopic response. SC RZB maintenance dosing in delayed responders was well tolerated. The profile of treatment emergent adverse events was consistent with the known safety profile of patients with CD treated with RZB. No new safety risks were identified.

Conclusion: RZB was efficacious in patients with delayed clinical response to RZB induction. These findings underscore the additional clinical benefit of SC RZB treatment in maintenance, even in patients who were initial non-responders to 12-wks IV RZB induction. RZB was well tolerated in delayed responders with no new safety risks identified.

Table 1. Efficacy and Safety after 52-Weeks Maintenance SC RZB Dosing in Delayed Responders (NRI-NCa)

Responder Group Treatment Group, n (%) [95% CI]	CDAI Clinical Response	Enhanced Clinical Response	CDAI Clinical Remission	SF/APS Clinical Remission	Endoscopic Response	Ulcer Free Endoscopy	Endoscopic Remission	SF/APS Clinical Remission and Endoscopic Response	Deep Remission
RZB 180 mg SC delayed responders, Wk 24	53.3 (6/30) [35.5, 71.2]	56.7 (17/30) [38.9, 74.4]	53.3 (16/30) [35.5, 71.2]	43.3 (13/30) [25.6, 61.1]	36.7 (11/30) [19.4, 53.9]	27.6 (8/29) [11.3, 43.9]	40.0 (12/30) [22.5, 57.5]	23.3 (7/30) [8.2, 38.5]	40.0 (12/30) [22.5, 57.5]
RZB 360 mg SC delayed responders, Wk 24	75.8 (25/33) [61.1, 90.4]	66.7 (22/33) [50.6, 82.8]	66.7 (22/33) [50.6, 82.8]	54.5 (18/33) [37.6, 71.5]	45.5 (15/33) [28.5, 62.4]	24.2 (8/33) [9.6, 38.9]	42.4 (14/33) [25.6, 59.3]	36.4 (12/33) [20.0, 52.8]	39.4 (13/33) [22.7, 56.1]

Responder Group Treatment Group, (E/100PYs)	Deaths	Serious infections	All treatment emergent adverse events	AE related to COVID-19	Serious AE	Hepatic events	Injection site reactions	AE leading to discontinuation of study drug	Crohn's Disease
RZB 180 mg SC (N=31) (PYs=27.5) delayed responders, Wk 24	0	0	132 (479.8)	0	6 (21.8)	0	6 (21.8)	2 (7.3)	7 (25.4)
RZB 360 mg SC (N=33) (PYs=32.1) delayed responders, Wk 24	0	1 (3.1)	83 (258.9)	0	4 (12.5)	1 (3.1)	2 (6.2)	0	7 (21.8)

S715

Clinical and Endoscopic Improvements With Risankizumab Induction and Maintenance Dosing versus Placebo Are Observed Irrespective of Number of Prior Failed Biologics

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Introduction: In phase 3 induction (ADVANCE, MOTIVATE) and maintenance (FORTIFY) studies, risankizumab (RZB), was well-tolerated and efficacious in patients with moderate to severe Crohn's disease (CD) who failed/were intolerant to conventional or biologic therapy. This post-hoc analysis examined efficacy and safety of RZB induction and maintenance dosing based on number of prior biologics failed.
Methods: Clinical and endoscopic endpoints (see Table footnotes for endpoints, definitions) were assessed for RZB versus (vs) PBO following intravenous (IV) induction and subcutaneous (SC) maintenance dosing based on prior failure of 1, 2, or ≥3 biologics. Pooled induction data are reported for PBO and RZB 600 mg IV q4w groups at Week (Wk) 12. Data from withdrawal (PBO SC), RZB 180 mg, and RZB 360 mg SC q8w groups are reported at FORTIFY Wk 52.
Results: At induction baseline (BL), 48%, 25%, and 27% of patients failed 1, 2, and ≥3 prior biologics, respectively, with 6%, 27%, and 75% having prior vedolizumab exposure and 2%, 12%, and 59% having prior ustekinumab exposure. Most (90%) patients who failed 1 biologic and all who failed ≥2 biologics were anti-TNF refractory. BL characteristics were generally balanced across subgroups, although disease duration and steroid use were slightly higher in the '≥3 subgroup'. Across the subgroups, patients achieved greater rates of clinical remission and endoscopic response with RZB 600 mg IV vs PBO at induction Wk 12, with greater efficacy generally observed in patients failing fewer biologics. At FORTIFY Wk 52, patients achieved greater endoscopic remission and response rates with RZB 180 mg and RZB 360 mg SC vs withdrawal (PBO SC) across most subgroups, while the endpoints of ulcer-free endoscopy and deep remission were significant with RZB 360 mg SC. Patients who failed 2 and ≥3 prior biologics achieved higher clinical remission rates with RZB 360 mg SC vs withdrawal (PBO SC) at Wk52. There were no differences in treatment emergent adverse events among subgroups at induction Wk 12 or maintenance Wk 52.
Conclusion: Induction and maintenance dosing of RZB was efficacious and well tolerated in patients with CD irrespective of number of prior biologics failed. Endoscopic response and remission rates were greater with both RZB SC doses vs PBO across all subgroups at induction Wk 12 and maintenance Wk 52. Rates of ulcer-free endoscopy and deep remission at maintenance Wk 52 were greater with RZB 360 mg SC across all subgroups.

Table 1. Achievement of Clinical and Endoscopic Outcomes at Week 12 of Induction and Week 52 of Maintenance by Number of Prior Biologics Failed (ITT#)

	ADVANCE + MOTIVATE, Week 12 % Patients Achieving Endpoint [95% CI] P-value						FORTIFY, Week 52 % Patients Achieving Endpoint [95% CI] P-value								
Outcome	PBO, Failed 1 biologic	RZB 600 mg IV, Failed 1 biologic	PBO, Failed 2 biologics	RZB 600 mg IV, Failed 2 biologics	PBO, Failed ≥3 biologics	RZB 600 mg IV, Failed ≥3 biologics	PBO, Failed 1 biologic	RZB 180 mg SC, Failed 1 biologic	RZB 360 mg SC, Failed 1 biologic	PBO, Failed 2 biologics	RZB 180 mg SC, Failed 2 biologics	RZB 360 mg SC, Failed 2 biologics	PBO, Failed ≥3 biologics	RZB 180 mg SC, Failed ≥3 biologics	RZB 360 mg SC, Failed ≥3 biologics
Number of Patients, n/N (%)	129/362 (35.6)	192/527 (36.4)	75/362 (20.7)	94/527 (17.8)	80/362 (22.1)	100/527 (19.0)	61/166 (36.7)	43/159 (27.0)	51/141 (36.2)	37/166 (22.3)	44/159 (27.7)	27/141 (19.1)	27/166 (16.3)	28/159 (17.6)	24/141 (17.0)
SF/APS Clinical Remission	24 [16.7, 31.4]	39.6 [32.7, 46.5] **P=0.004**	21.3 [12.1, 30.6]	41.5 [31.5, 51.4] **P=0.004**	13.8 [6.2, 21.3]	30 [21.0, 39.0] **P=0.019**	43.3 [30.8, 55.9]	54.8 [39.7, 69.8] **P=0.046**	45.2 [31.3, 59.1] P=0.250	27.8 [13.1, 42.4]	30.2 [16.5, 44.0 P=0.951	44.4 [25.7, 63.2] P=0.186	22.2 [6.5, 37.9]	35.7 [18.0, 53.5] P=0.153	58.3 [38.6, 78.1] **P=0.009**
CDAI Clinical Remission	24 [16.7, 31.4]	42 [35.0, 49.0] **P=0.001**	25.3 [15.5, 35.2]	49.1 [39.0, 59.3] **P=0.001**	15 [7.2, 22.8]	36 [26.6, 45.4] **P=0.004**	45 [32.4, 57.6]	57.1 [42.2, 72.1] **P=0.045**	50.1 [36.2, 64.1] P=0.168	25 [10.9, 39.1]	51.2 [36.2, 66.1] **P=0.040**	48.1 [29.3, 67.0] **P=0.045**	25.9 [9.4, 42.5]	32.1 [14.8, 49.4] P=0.533	41.7 [21.9, 61.4] P=0.275
Endoscopic Response	14.7 [8.6, 20.8]	35.8 [29.0, 42.6]	10.7 [3.7, 17.7]	24.5 [15.8,	6.3 [1.0, 11.6]	27.2 [18.4, 35.9]	28.3 [16.9, 39.7]	47.6 [32.5,	42.4 [28.7,	13.9 [2.6, 25.2]	39.5 [24.9, 54.1]	48.1 [29.3,	11.1 [0.0, 23.0]	32.1 [14.8,	41.7 [21.9, 61.4]

Table 1. (*continued*)

Outcome	ADVANCE + MOTIVATE, Week 12 % Patients Achieving Endpoint [95% CI] P-value						FORTIFY, Week 52 % Patients Achieving Endpoint [95% CI] P-value								
	PBO, Failed 1 biologic	RZB 600 mg IV, Failed 1 biologic	PBO, Failed 2 biologics	RZB 600 mg IV, Failed 2 biologics	PBO, Failed ≥3 biologics	RZB 600 mg IV, Failed ≥3 biologics	PBO, Failed 1 biologic	RZB 180 mg SC, Failed 1 biologic	RZB 360 mg SC, Failed 1 biologic	PBO, Failed 2 biologics	RZB 180 mg SC, Failed 2 biologics	RZB 360 mg SC, Failed 2 biologics	PBO, Failed ≥3 biologics	RZB 180 mg SC, Failed ≥3 biologics	RZB 360 mg SC, Failed ≥3 biologics
		P< 0.001		33.2] **P=0.016**		**P< 0.001**		62.7] **P=0.020**	56.1] **P=0.012**		**P< 0.001**	67.0] **P=0.001**		49.4] **P=0.020**	**P< 0.001**
Endoscopic Remission	5.4 [1.5, 9.3]	25.6 [19.4, 31.8] **P< 0.001**	5.3 [0.2, 10.4]	8.5 [2.9, 14.2] P=0.414	2.5 [0.0, 5.9]	16 [8.8, 23.2] **P=0.003**	13.3 [4.7, 21.9]	33.3 [19.1, 47.6] **P=0.011**	33.5 [20.5, 46.5] **P< 0.001**	5.6 [0.0, 13.0]	18.6 [7.0, 30.2] **P=0.030**	40.7 [22.2, 59.3] **P< 0.001**	7.4 [0.0, 17.3]	7.1 [0.0, 16.7] P=0.903	33.3 [14.5, 52.2] **P< 0.001**
Ulcer-Free Endoscopy	6.3 [2.1, 10.4]	18.7 [13.1, 24.3] **P< 0.001**	4.0 [0.0, 8.4]	9.7 [3.7, 15.7] P=0.132	1.3 [0.0, 3.7]	10.1 [4.2, 16.0] **P=0.010**	10.3 [2.5, 18.2]	23.8 [10.9, 36.7] P=0.066	29.5 [17.0, 42.1] **P=0.001**	2.8 [0.0, 8.1]	16.3 [5.2, 27.3] P=0.097	22.2 [6.5, 37.9] **P=0.004**	3.7 [0.0, 10.8]	7.1 [0.0, 16.7] P=0.414	25 [7.7, 42.3] **P=0.008**
Deep Remission	3.1 [0.1, 6.1]	15.6 [10.5, 20.8] **P< 0.001**	1.3 [0.0, 3.9]	6.4 [1.4, 11.3] P=0.074	2.5 [0.0, 5.9]	9.0 [3.4, 14.6] P=0.106	11.7 [3.5, 19.8]	23.8 [10.9, 36.7] P=0.066	21.8 [10.4, 33.2] **P=0.044**	5.6 [0.0, 13.0]	16.3 [5.2, 27.3] P=0.097	29.6 [12.4, 46.9] **P=0.002**	3.7 [0.0, 10.8]	7.1 [0.0, 16.7] P=0.414	20.8 [4.6, 37.1] **P=0.012**

CDAI = CD Activity Index; SF = stool frequency; APS = Abdominal pain score; PBO = Placebo; RZB = Risankizumab; SF/APS Clinical Remission = Average daily SF ≤2.8 and not worse than baseline of the induction study and average daily AP score ≤1 and not worse than baseline of the induction study; CDAI Clinical Remission = CDAI < 150; Endoscopic Response = SES-CD ≤4 and at least a 2-point reduction versus baseline of the induction study and no subscore >1 in any individual variable, as scored by a central reviewer; Ulcer Free Endoscopy = SES-CD ulcerated surface subscore of 0 in subjects with SES-CD ulcerated surface subscore ≥1 at baseline of the induction study, as scored by a central reviewer; Endoscopic Remission = SES-CD ≤4 and at least a 2 point reduction versus baseline of the induction study and no subscore greater than 1 in any individual variable, as scored by a central reviewer; Deep Remission = CDAI clinical remission and endoscopic remission

#Intent-to-treat (ITT) population: Includes randomized patients who (ADVANCE/MOTIVATE) received at least one dose of study drug during the 12-Week Induction Period, and had an SES-CD of ≥6 (≥4 for isolated ileal disease) or who (FORTIFY) received IV risankizumab for 12 weeks in the induction study and at least one dose of study drug in FORTIFY sub-study 1 and had an SES-CD of ≥6 (≥ 4 for isolated ileal disease) at baseline of induction.

Calculations were based on multiple imputation to handle missing data due to COVID-19 or non-responder imputation only if there are no missing data due to COVID-19. P-values for pairwise treatment comparisons were provided within each bio-failure subgroup category based on the Cochran-Mantel-Haenszel test adjusted for strata.

S716

Induction Combination Therapy With Guselkumab and Golimumab Followed by Guselkumab Monotherapy Maintenance: Results of the Phase 2a, Randomized, Double-Blind, Proof-of-Concept VEGA Study

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Introduction: Week (wk) 12 data from the VEGA study demonstrated that dual blockade of interleukin (IL)-23 and TNFα more effectively induced clinical response, clinical remission, endoscopic improvement, and composite histologic-endoscopic outcomes than either monotherapy alone. The efficacy and safety of combination induction therapy with guselkumab (GUS) + golimumab (GOL) followed by GUS monotherapy for maintenance (combination GUS) vs GUS or GOL alone were evaluated through wk38 in adults with moderately-to-severely active UC.

Methods: 214 patients (pts) naïve to TNFα antagonists and refractory or intolerant to conventional therapy were randomized to receive GUS 200mg intravenous (IV) at wks0, 4, and 8 100mg subcutaneous (SC) every 8 wks (q8w) (n=71); GOL 200mg subcutaneous (SC) at wk0 then 100mg SC at wk2 and q4w thereafter (n=72); or combination therapy with GUS 200mg IV+GOL 200mg SC at wk0, GOL 100mg SC at wks2, 6, and 10, and GUS 200mg IV at wks4 and 8 followed by GUS 100 mg SC q8w (n=71). After wk12, pts randomized to monotherapy continued treatment through the final efficacy assessment at wk38, while pts randomized to the combination group transitioned to maintenance GUS. Clinical, endoscopic, histologic, and composite histologic-endoscopic endpoints were assessed. Safety was assessed through the final safety visit (up to wk50 or 16 wks after the final dose of study intervention).

Results: Overall, 13.1% of pts discontinued treatment prior to wk34 (final dose of study intervention). Clinical remission rates (based on the full Mayo score) at wk38 in the combination GUS group (43.7%) were greater than the GUS and GOL monotherapy groups (31.0% and 22.2%, respectively, Table). Rates of clinical remission by modified Mayo (mMayo) score components, endoscopic improvement, endoscopic normalization, histologic remission, and composite histologic-endoscopic endpoints at wk38 were also greater in the combination GUS group than the GUS or GOL monotherapy groups. GUS monotherapy resulted in greater rates of clinical, endoscopic, and histologic outcomes than GOL monotherapy at wk38. Adverse event (AE), serious AE, infection, and serious infection rates were comparable among treatment groups through the final safety visit.

Conclusion: Pts who received combination GUS treatment maintained greater rates of clinical remission, endoscopic improvement, endoscopic normalization, and both histologic remission and endoscopic improvement at wk38 than those who received GUS or GOL monotherapy.

Table 1. **Efficacy at wk 38; intent-to-treat population**

Outcome, n (%)	GOL (N=72)	GUS (N=71)	Combination → GUS (N=71)	Δ (80% CI)[a] P-value[b] Combination → GUS vs. GOL	Δ (80% CI)[a] P-value[b] Combination → GUS vs. GUS
Clinical remission[c,d]	16 (22.2)	22 (31.0)	31 (43.7)	21.5 (11.9, 31.2) 0.006	12.7 (2.7, 22.7) 0.109
Clinical remission (based on mMayo)[c,e]	15 (20.8)	22 (31.0)	34 (47.9)	27.1 (17.7, 36.6) < 0.001	16.9 (7.0, 26.8) 0.033
Symptomatic remission[c,f]	43 (59.7)	49 (69.0)	49 (69.0)	9.4 (-0.6, 19.4) 0.238	0.0 (-9.7, 9.7) 1.000
Endoscopic improvement[c,g]	16 (22.2)	23 (32.4)	35 (49.3)	27.2 (17.6, 36.7) < 0.001	16.9 (7.0, 26.8) 0.033
Endoscopic normalization[c,h]	5 (6.9)	11 (15.5)	18 (25.4)	18.5 (11.1, 25.9) 0.002	9.9 (1.6, 18.2) 0.134

Table 1. (*continued*)

Outcome, n (%)	GOL (N=72)	GUS (N=71)	Combination → GUS (N=71)	Δ (80% CI)[a] P-value[b] Combination → GUS vs. GOL	Δ (80% CI)[a] P-value[b] Combination → GUS vs. GUS
Histologic remission[c,i]	18 (25.0)	29 (40.8)	36 (50.7)	25.8 (16.1, 35.5) 0.001	9.9 (-0.4, 20.1) 0.224
Both histologic remission and endoscopic improvement[c,g,i]	10 (13.9)	15 (21.1)	30 (42.3)	28.5 (19.6, 37.4) < 0.001	21.1 (11.8, 30.5) 0.005
Both histologic remission and endoscopic normalization[c,h,i]	4 (5.6)	9 (12.7)	17 (23.9)	18.5 (11.3, 25.6) 0.002	11.3 (3.3, 19.2) 0.074

[a]The adjusted treatment difference between the combination therapy vs. the monotherapy groups and the confidence interval were based on the Wald statistic with the Cochran-Mantel-Haenszel (CMH) weight.
[b]The p-value was based on the 2-sided CMH chi-square test, stratified by corticosteroid use at baseline (Yes, No). All P-values are nominal.
[c]Pts who had an ostomy or colectomy, had a protocol-prohibited change in concomitant UC medications, or discontinued study intervention due to lack of a therapeutic effect or an adverse event of worsening UC, or discontinued study agent early due to COVID-19 related reasons (excluding COVID-19 infection) prior to the wk 38 visit were considered to not have achieved the binary endpoints. Pts with missing data at wk 38 were considered to not have achieved the binary endpoints.
[d]Clinical remission is defined as Mayo score ≤2, with no individual subscore >1.
[e]Clinical remission (based on the mMayo) is defined as a stool frequency subscore of 0 or 1, where the stool frequency subscore has not increased from baseline, a rectal bleeding subscore of 0, and an endoscopy subscore of 0 or 1 with no friability present on endoscopy.
[f]Symptomatic remission is defined as Mayo stool frequency subscore of 0 or 1, where the stool frequency subscore has not increased from baseline, and a rectal bleeding subscore of 0.
[g]Endoscopic improvement is defined as an endoscopy subscore of 0 or 1 with no friability present on the endoscopy.
[h]Endoscopic normalization is defined as an endoscopy subscore of 0.
[i]Histologic remission is defined as absence of neutrophils from the mucosa (both lamina propria and epithelium), no crypt destruction, and no erosions, ulcerations or granulation tissue according to the Geboes grading system.

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The Effect of Guselkumab Induction Therapy in Patients With Moderately to Severely Active Ulcerative Colitis: QUASAR Phase 2b Induction Results at Week 12 by Prior Inadequate Response or Intolerance to Advanced Therapy

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Introduction: QUASAR (NCT04033445) is a phase 2b randomized, double-blind, placebo-controlled study that evaluates guselkumab (GUS), an interleukin-23 p19 subunit antagonist, as induction treatment in patients with moderately to severely active ulcerative colitis (UC) who had an inadequate response or intolerance to conventional (ie, thiopurines or corticosteroids) or advanced therapy (ADT; ie, tumor necrosis factor alpha antagonists, vedolizumab, or tofacitinib). Here we report efficacy results at Week 12 by prior inadequate response or intolerance to ADT.
Methods: Patients included had moderately to severely active UC (defined as a modified Mayo score of 5 to 9 with a Mayo rectal bleeding subscore ≥ 1 and a Mayo endoscopy subscore ≥ 2 obtained during central review of video endoscopy at baseline). Patients were randomized 1:1:1 to receive IV GUS 400 mg, 200 mg, or placebo at Weeks 0, 4, and 8. At Week 12, clinical response, clinical remission, symptomatic remission, endoscopic improvement, histo-endoscopic mucosal improvement, and endoscopic normalization were compared for GUS vs placebo by prior response/intolerance to ADT.
Results: Three hundred thirteen patients were assessed; 148 patients (47.3%) had prior inadequate response/intolerance to ADT, approximately half of these patients had prior inadequate response/intolerance to 2 or more ADT classes. Clinical response at Week 12 was achieved by a higher proportion of patients treated with GUS vs placebo: 50.5% vs 25.5% for patients with prior inadequate response/intolerance to ADT and 70.3% vs 29.6% for those without prior inadequate response/intolerance to ADT. Higher proportions of patients treated with GUS vs placebo achieved clinical and endoscopic/histologic outcomes at Week 12 in both the ADT inadequate response/intolerant and non-ADT inadequate response/intolerant populations (Table). The efficacy of IV GUS 200 mg and 400 mg was comparable in patients with or without a history of inadequate response/intolerance to ADT.
Conclusion: Treatment with GUS resulted in greater improvements compared with placebo across key clinical and endoscopic/histologic outcome measures at Week 12 in patients with moderately to severely active UC with or without a history of inadequate response/intolerance to ADT.

Table 1. **Efficacy at Week 12 by prior response/intolerance to ADT**

	Placebo IV (N=105)	GUS 200 mg IV (N=101)	GUS 400 mg IV (N=107)	GUS Combined(N=208)
Patients with a history of inadequate response/intolerance to ADT	51	46	51	97
Clinical response [a1,b,c,d,e] (95% CI)	25.5% (14.3, 39.6)	54.3%* (39.0, 69.1)	47.1%* (32.9, 61.5)	50.5%* (40.2, 60.8)
Clinical remission [a2,b,c,d,e] (95% CI)	7.8% (2.2, 18.9)	17.4% (7.8, 31.4)	17.6% (8.4, 30.9)	17.5% (10.6, 26.6)
Symptomatic remission [a3,b,c,d,e] (95% CI)	17.6% (8.4, 30.9)	39.1%* (25.1, 54.6)	37.3%* (24.1, 51.9)	38.1%* (28.5, 48.6)
Endoscopic improvement [a4,b,c,d,e] (95% CI)	9.8% (3.3, 21.4)	23.9% (12.6, 38.8)	21.6% (11.3, 35.3)	22.7% (14.8, 32.3)
Histo-endoscopic mucosal improvement [a5,b,c,d,e] (95% CI)	5.9% (1.2, 16.2)	13.0% (4.9, 26.3)	19.6%* (9.8, 33.1)	16.5% (9.7, 25.4)
Endoscopic normalization [a6,b,c,d,e] (95% CI)	5.9% (1.2, 16.2)	10.9% (3.6, 23.6)	5.9% (1.2, 16.2)	8.2% (3.6, 15.6)
Patents with no history of inadequate response/intolerance to ADT	**54**	**55**	**56**	**111**
Clinical response[a1,b,c,d,e] (95% CI)	29.6% (18.0, 43.6)	67.3%** (53.3, 79.3)	73.2%** (59.7, 84.2)	70.3%** (60.9, 78.6)
Clinical remission[a2,b,c,d,e] (95% CI)	11.1% (4.2, 22.6)	32.7%* (20.7, 46.7)	32.1%* (20.3, 46.0)	32.4%* (23.9, 42.0)
Symptomatic remission[a3,b,c,d,e] (95% CI)	22.2% (12.0, 35.6)	58.2%** (44.1, 71.3)	57.1%** (43.2, 70.3)	57.7%** (47.9, 67.0)
Endoscopic improvement [a4,b,c,d,e] (95% CI)	14.8% (6.6, 27.1)	36.4%* (23.8, 50.4)	39.3%* (26.5, 53.2)	37.8%* (28.8, 47.5)

Table 1. (*continued*)

	Placebo IV (N=105)	GUS 200 mg IV (N=101)	GUS 400 mg IV (N=107)	GUS Combined(N=208)
Histo-endoscopic mucosal improvement[a5,b,c,d,e] (95% CI)	11.1% (4.2, 22.6)	27.3%* (16.1, 41.0)	33.9%* (21.8, 47.8)	30.6%* (22.2, 40.1)
Endoscopic normalization[a6,b,c,d,e] (95% CI)	7.4% (2.1, 17.9)	23.6%* (13.2, 37.0)	21.4%* (11.6, 34.4)	22.5%* (15.1, 31.4)

*Nominal p-value < 0.05.
**Nominal p-value < 0.001.
[a1]Clinical response is defined as decrease from induction baseline in the modified Mayo score by ≥30% and ≥2 points, with either a ≥1-point decrease from baseline in the rectal bleeding subscore or a rectal bleeding subscore of 0 or 1.
[a2]Clinical remission is defined as stool frequency subscore of 0 or 1 with no increase from induction baseline, a rectal bleeding subscore of 0, and an endoscopy subscore of 0 or 1 with no friability present on the endoscopy.
[a3]Symptomatic remission is defined as a stool frequency subscore of 0 or 1 with no increase from induction baseline and a rectal bleeding subscore of 0.
[a4]Endoscopic improvement is defined as an endoscopy subscore of 0 or 1 with no friability present on the endoscopy.
[a5]Histo-endoscopic mucosal improvement is defined as achieving a combination of histologic improvement (neutrophil infiltration in < 5% of crypts, no crypt destruction, and no erosions, ulcerations or granulation tissue according to the Geboes grading system) and endoscopic improvement,
[a6]Endoscopic normalization is defined as an endoscopy subscore of 0.
[b]Patients who had a prohibited change in UC medication, an ostomy or colectomy, or discontinued study agent due to lack of efficacy or an adverse event of worsening of UC prior to the Week 12 visit were considered not to have achieved the endpoint.
[c]Data after discontinuation of study agent due to COVID-19 related reasons (excluding COVID-19 infection) were considered to be missing.
[d]Patients who were missing one or more components pertaining to a specified endpoint at Week 12 were considered not to have achieved the endpoint.
[e]The p-values were based on the Cochran-Mantel-Haenszel (CMH) chi-square test.

S718

One-Year Comparative Effectiveness of Ustekinumab vs Tofacitinib for Ulcerative Colitis After Anti-Tumor Necrosis Factor Failure

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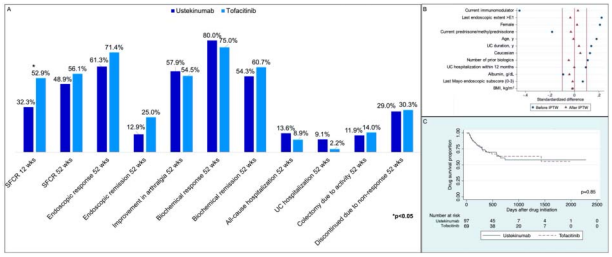
Introduction: Tofacitinib (tofa) is an oral small molecule JAK inhibitor for treatment of ulcerative colitis (UC). Real-world data comparing effectiveness of ustekinumab (uste) vs tofa are limited. We compared 52 wk outcomes and drug survival of uste vs tofa for UC.
Methods: In this retrospective cohort study, adults initiated uste or tofa after failure of ≥1 anti-TNF agent 5/1/18-4/1/21 at a large US academic center. Electronic records were reviewed. The primary outcome was steroid-free clinical remission (SFCR; i.e. simple clinical colitis activity index ≤2 or provider assessment and no use of oral/IV steroids for ≥30 days) at 12 and 52 (+/-4) weeks. Other outcomes: drug survival, endoscopic response/remission, biochemical response/remission, improvement in arthralgia, hospitalization, and colectomy within 52 wks. Reasons for discontinuation are reported descriptively. Inverse probability of treatment weighted (IPTW) logistic and Cox regression were used to calculate adjusted odds ratios (aORs) and hazard ratios (aHRs). Kaplan-Meier drug survival curves were compared using log-rank tests.
Results: 97 pts initiated uste and 69 initiated tofa with median follow-up of 62.0 wks (IQR 35.6-97.0 wks) and 88.0 wks (IQR 40.9-153.1 wks), respectively. Baseline characteristics were similar except for immunomodulator use, Mayo endoscopic subscore, and CRP (Table). At 12 wks, 31/96 (32.3%) uste pts and 36/68 (52.9%) tofa pts were in SFCR (p< 0.01). At 52 wks, 44/90 (48.9%) uste pts and 37/66 (56.1%) tofa pts were in SFCR (p=0.38). 38/97 uste pts and 30/69 tofa pts discontinued tofa during follow-up: non-response (includes colectomy; 89.5% uste, 83.3% tofa), dysplasia requiring colectomy (7.9% uste, 6.7% tofa), insurance or adherence (0% uste, 6.6% tofa), and adverse events (2.6% uste, 3.3% tofa). Patients who discontinued for adverse events had nausea with arthralgia (n=1, uste) and elevated liver enzymes (n=1, tofa). Unadjusted outcomes are presented in Figure A. After IPTW, covariate balance was confirmed with < |10%| standardized differences (Figure B). There was no association between tofa vs uste for SFCR 12 wks (aOR 1.94, 95% CI 0.96-3.92) or 52 wks (aOR 1.16, 95% CI 0.58-2.31). Drug survival was similar between groups (aHR 1.26, 95% CI 0.74-2.15) (Figure C).
Conclusion: In a real-world, anti-TNF exposed cohort of UC pts, uste and tofa showed similar effectiveness/safety at 52 wks with approximately 50% of pts in SFCR. Due to limited sample size, larger real-world studies are needed to confirm these findings.



[0718] **Figure 1.** A. Unadjusted outcomes. Definitions of other outcomes: endoscopic response (improvement in Mayo endoscopic subscore by >1 point) and remission (Mayo endoscopic subscore=0) within 52 weeks, biochemical response (improvement in elevated C-reactive protein [CRP] or fecal calprotectin [FC] by >25% from baseline) and remission (normalized CRP or FC) within 52 weeks. Denominators for outcomes vary due to differences in available data pre- and post-drug initiation: SFCR 12 wks (n = 96 uste, 68 tofa), SFCR 52 wks (n = 90 uste, 66 tofa), endoscopy (n = 31 uste, 28 tofa), arthralgia (n = 19 uste, 22 tofa), biochemical (n = 35 uste, 28 tofa), hospitalization (n = 66 uste, 45 tofa), colectomy (n = 67 uste, 50 tofa), discontinuation (n = 93 uste, 66 tofa). Hospitalization and colectomy only consider patients who remained on treatment for full duration of 52 weeks unless outcome was met earlier. *P-values comparing uste vs tofa proportions for each outcome were calculated using Fisher's exact test; only SFCR 12 wks was significant at p<0.05. B. Covariate balance before and after IPTW. These covariates, which were used to calculate propensity scores, were chosen a priori based on clinical significance and data availability. C. Kaplan-Meier analysis stratified by treatment group. Patients were censored at loss to follow-up or when they discontinued treatment for reasons unrelated to efficacy (e.g. adverse event, dysplasia, adherence). Abbreviations: SFCR = steroid-free clinical remission, IPTW = inverse probability of treatment weighting.

Table 1. **Baseline Characteristics**

Baseline Characteristics	Ustekinumab (n=97)	Tofacitinib (n=69)	P-value*
Female	49 (51%)	42 (61%)	0.19
Age, y, median (IQR)	35.5 (29.4, 50.4)	41.2 (28.1, 54.0)	0.25
UC duration, y, median (IQR)	9.0 (4.1, 13.5)	9.5 (4.4, 15.5)	0.39
Race			
Caucasian	85 (88%)	63 (91%)	0.40

Table 1. (*continued*)

Baseline Characteristics	Ustekinumab (n=97)	Tofacitinib (n=69)	P-value*
Black	4 (4%)	0 (0%)	
Asian	5 (5%)	4 (6%)	
Other/Unknown	3 (3%)	2 (3%)	
Ethnicity			
Non-Hispanic	89 (92%)	69 (100%)	0.05
Hispanic	4 (4%)	0 (0%)	
Unknown	4 (4%)	0 (0%)	
Prior malignancy	5 (5%)	4 (6%)	0.86
Number of prior biologics, median (IQR)	2 (2,3)	2 (2,3)	0.62
Number of prior anti-TNFs, median (IQR)	1 (1,2)	2 (1,2)	0.18
Prior vedolizumab	64 (66%)	51 (74%)	0.27
Prior tofacitinib	25 (26%)	0 (0%)	n/a
Prior ustekinumab	0 (0%)	8 (12%)	n/a
Prior 5-ASA	94 (97%)	67 (97%)	0.94
Current 5-ASA	19 (20%)	10 (14%)	0.39
Prior immunomodulator	70 (72%)	54 (78%)	0.37
Current immunomodulator	24 (25%)	6 (9%)	0.008
Current Oral/IV corticosteroids			0.41
Prednisone/Methylprednisolone	51 (53%)	30 (43%)	
Budesonide	11 (11%)	7 (10%)	
BMI, kg/m^2, median (IQR)	25.1 (21.7, 29.0)	25.79 (21.8, 28.9)	0.97
Arthralgia at time of drug initiation	26 (27%)	26 (38%)	0.14
Last Montreal disease extent >E1 (i.e. >proctitis)	75 (77%)	59 (86%)	0.19
Last Mayo endoscopic subscore (severity)			0.049
0 (None)	10 (10%)	6 (9%)	
1 (Mild)	20 (21%)	7 (10%)	
2 (Moderate)	32 (33%)	37 (54%)	
3 (Severe)	35 (36%)	19 (28%)	
Smoking			0.31
Never	70 (72%)	56 (81%)	
Current	2 (2%)	2 (3%)	
Former	25 (26%)	11 (16%)	
Current cannabis use	22 (23%)	9 (13%)	0.12
Current opioid use	3 (3%)	6 (9%)	0.12
UC hospitalization within 12 months	21 (22%)	18 (26%)	0.51
Serum albumin, g/dL, median (IQR)	4.1 (3.8, 4.4)	4.1 (3.8, 4.3)	0.47
C-reactive protein, mg/L, median (IQR)	2.8 (1, 7)	5.1 (1.8, 22.8)	0.01
Fecal calprotectin > 120 ug/g	49 (88%)	25 (89%)	0.81
SCCAI, median (IQR)	5 (3, 7)	5 (4, 8)	0.46
Daily bowel movement frequency, median (IQR)	6 (4, 9)	6 (4, 10)	0.57

Abbreviations: IQR = interquartile range, TNF= tumor necrosis factor, ASA = aminosalicylic acid, SCCAI = simple clinical colitis activity index.
*Calculated using Pearson's chi squared and Wilcoxon rank-sum tests Albumin, C-reactive protein, fecal calprotectin, SCCAI, and bowel movements were the most recent values available within 3 month prior to drug initiation. The most recent endoscopic data preceding drug initiation was used. Median time from endoscopic evaluation to drug initiation was 22.4 weeks (IQR 3.9 -44.1 weeks) for ustekinumab and 19.1 weeks (IQR 6.1-46.1 weeks) for tofacitinib.

S719 Outstanding Research Award in the IBD Category (Trainee)

Maternal and Neonatal Outcomes in Vedolizumab and Ustekinumab Exposed Pregnancies: Results From the PIANO Registry

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Introduction: Pregnancy outcomes in IBD patients with quiescent disease are similar to the general population. Data from the Pregnancy Inflammatory bowel disease And Neonatal Outcomes (PIANO) registry have demonstrated the safety of anti-tumor necrosis factor alpha (TNFs) and thiopurines in pregnancy. The objective of this study is to provide updated information from the PIANO registry on maternal and fetal outcomes in patients exposed to ustekinumab (UST) and vedolizumab (VDZ).
Methods: In this multicenter prospective observational study, we included pregnant women with singleton pregnancies and a diagnosis of inflammatory bowel disease. Questionnaires were administered to women at study intake, each subsequent trimester, delivery, and at 4, 9, and 12 months after birth. Bivariate analyses were utilized to determine the independent effects of specific drug classes on outcomes. The exposure cohorts were VDZ, UST, TNFs, immunomodulators, and combination with biologics and immunomodulators. All were compared to no exposure to biologics/immunomodulators.
Results: There were 1642 completed pregnancies with 1581 live births. Maternal mean age was 32.1±4.6 years at delivery with 62 VDZ and 43 UST exposed. Women on UST were more likely to have Crohn's disease. There was no increased risk of spontaneous abortion, small for gestational age, low birth weight, neonatal intensive care unit stay, congenital malformations, or intrauterine growth restriction with in utero VDZ or UST exposure (Table). The rate of preterm birth was 0% in UST, 12.7% VDZ, 8.2% TNFs, and 9.7% in the unexposed cohort (p = 0.037). Rates of serious and non-serious infections at birth and within the first 12 months of life were comparable among all groups, with an increase in nonserious infections in VDZ group at 4 months, which did not persist at 1 year. There was no increased risk of placental complications in the VDZ cohort compared to the unexposed cohort. UST infant concentrations at birth were increased whereas VDZ concentrations were overall decreased compared to maternal serum drug concentrations.

Conclusion: An updated analysis of UST and VDZ exposure during pregnancy suggests no increase in complications compared to TNFs, immunomodulators and combination of biologics with immunomodulators. UST was associated with lower rates of preterm birth and Cesarean section. No signal was found for increased placental events with either therapy. Continuation of UST and VDZ during pregnancy is recommended.

Table 1. Pregnancy Related Complications by Drug Exposure in completed pregnancies

Pregnancy Events (% yes)	No exposure (n = 430)	Anti-TNFs (n = 700)	Immuno-modulators (n = 226)	Combination: Biologics + Immunomodulators (n = 179)	UST (n = 43)	VDZ (n = 62)	p-value
Any pregnancy complication	86/401 (21.4%)	123/649 (19.0%)	42/208 (20.2%)	28/169 (16.6%)	10/39 (25.6%)	10/59 (16.9%)	0.663
SAB (gestation ages ≤140 days)	9/234 (3.8%)	18/438 (4.1%)	6/136 (4.4%)	2/109 (1.8%)	2/21 (9.5%)	1/30 (3.3%)	0.675
SAB (all gestation ages)	11/429 (2.6%)	18/697 (2.6%)	7/226 (3.1%)	2/178 (1.1%)	2/43 (4.7%)	1/62 (1.6%)	0.739
Preterm birth (< 37 weeks)	38/391 (9.7%)	53/643 (8.2%)	25/204 (12.3%)	24/166 (14.5%)	0/38 (0.0%)	7/55 (12.7%)	0.037
Small for gestational age	16/383 (4.2%)	31/579 (5.4%)	5/202 (2.5%)	3/147 (2.0%)	1/14 (7.1%)	2/35 (5.7%)	0.356
LBW (< 2500 g)	21/380 (5.5%)	38/635 (6.0%)	9/206 (4.4%)	8/159 (5.0%)	1/38 (2.6%)	6/55 (10.9%)	0.493
Intrauterine growth restriction	11/429 (2.6%)	13/700 (1.9%)	1/226 (0.4%)	4/179 (2.2%)	0/43 (0.0%)	1/62 (1.6%)	0.455
Cesarean section	154/394 (39.1%)	292/650 (44.9%)	93/208 (44.7%)	90/168 (53.6%)	12/38 (31.6%)	26/55 (47.3%)	0.024
NICU at birth	58/397 (14.6%)	107/651 (16.4%)	31/209 (14.8%)	29/168 (17.3%)	4/37 (10.8%)	8/55 (14.5%)	0.879
Congenital malformations	28/268 (10.4%)	61/581 (10.5%)	19/150 (12.7%)	18/153 (11.8%)	7/39 (17.9%)	8/59 (13.6%)	0.715
Any of the above	275/430 (64.0%)	477/700 (68.1%)	156/226 (69.0%)	128/179 (71.5%)	28/43 (65.1%)	42/62 (67.7%)	0.513
Abruptio Placenta	3/198 (1.5%)	5/302 (1.7%)	1/93 (1.1%)	1/75 (1.3%)	0/13 (0.0%)	0/31 (0.0%)	>0.999
Pre-Eclampsia/Eclampsia	18/198 (9.1%)	30/302 (9.9%)	13/93 (14.0%)	7/75 (9.3%)	2/13 (15.4%)	4/31 (12.9%)	0.512
Placenta previa	5/197 (2.5%)	9/302 (3.0%)	2/93 (2.2%)	1/75 (1.3%)	0/13 (0.0%)	2/31 (6.5%)	0.243
Hemorrhage	5/197 (2.5%)	5/302 (1.7%)	5/93 (5.4%)	2/75 (2.7%)	3/13 (23.1%)	0/31 (0.0%)	>0.999
Postpartum hemorrhage	6/197 (3.1%)	15/302 (2.1%)	1/93 (1.1%)	5/75 (6.7%)	0/13 (0.0%)	1/31 (3.2%)	>0.999

TNF: tumor necrosis factor, UST: ustekinumab, VDZ: vedolizumab, SAB: spontaneous abortion, LBW: low birth weight, g: grams, NICU: neonatal intensive care unit, vs: versus.

S720

Endoscopic Severity Score of Immune-Mediated Colitis Is More Effective in Guiding Medical Treatment Than Clinical Severity Grade

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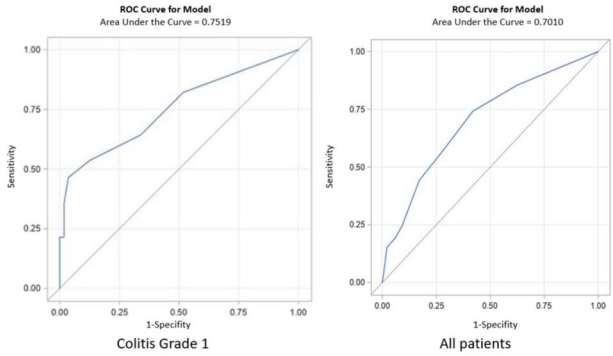
Introduction: Endoscopic scoring systems have not been established for immune-mediated colitis (IMC). Previous studies have shown benefits from early endoscopic evaluation, but the value of endoscopy compared to clinical assessment remains uncertain. This study aims to establish an endoscopic scoring system for IMC and explore its utility in predicting the need for selective immunosuppressive therapy (SIT, infliximab or vedolizumab) compared to clinical symptoms severity.

Methods: This is a retrospective study from 14 centers worldwide including 674 patients with IMC who underwent endoscopic valuation. Ten total endoscopic features were recorded based on endoscopic reports and assigned one point each (erythema, edema, loss of vasculature, friability, erosions, exudate, any ulcers, large ulcers, deep ulcers, ≥ 2 ulcers). The scoring system was devised by measuring the specificity of a selected score cutoff in predicting the need for SIT based on clinical consensus from the study group. IBM SPSS Statistics 26 was used to calculate specificities, Pearson correlations, and generate ROC curves (Figure).

Results: We divided the cohort to include a training set and a validation set. In the training set, an endoscopy score (ES) cut-off ≥4 has a specificity of 82.8% across all colitis grades and 96.4% among grade 1 colitis alone to predict SIT use. A cut-off ≥5 showed a specificity of 87.6% and 98.2% respectively. These specificities were comparable to those of the validation sets. In contrast, clinical colitis and diarrhea grading based on Common Terminology Criteria for Adverse Events (CTCAE) was poorly associated with future SIT use (specificities of 27.4% and 12.3% respectively). Moreover, this new scoring system with a cutoff of 4-5 had a numerically higher specificity to a Mayo Endoscopic Score (MES) of 3 when ulcer was a mandatory factor (85%-88.2% vs 74.6%). Early endoscopic evaluation in disease course was associated with early SIT use ($p < 0.001$, $r = 0.4084$). (Table)

Conclusion: This is the largest, multi-center study to devise an endoscopic scoring system highlighting the important value of endoscopy in guiding the management of IMC for the first time. The results demonstrated that an ES cutoff ≥4 can achieve a higher specificity in predicting SIT use than clinical symptom grading alone. This study supports early and thorough endoscopic evaluation for IMC and paves the way for future external validation of the described scoring system.

Figure 1. ROC Curve with Endoscopy Score



[0720] **Figure 1.** ROC curves

Table 1.

Specificity of prediction for selective immunosuppressant therapy use (infliximab and/or vedolizumab) by using endoscopy score cutoff 4 and 5				
	All colitis grades		Colitis CTCAE grade 1 only	
	Training set (N=337)	Validation set (CI) (N=337)	Training set (N=84)	Validation set (CI) (N=66)
Specificity (score cutoff 4)	82.8%	74.5% (68.5%, 80.3%)	96.4%	91.1% (82.2%, 97.9%)
Specificity (score cutoff 5)	87.6%	83.0% (77.8%, 88.3%)	98.2%	93.3% (85.1%, 100%)

Specificity of prediction for selective immunosuppressant therapy use (infliximab and/or vedolizumab) by using CTCAE grade of diarrhea and colitis		
CTCAE grade	**Patients**	**Specificity**
Colitis CTCAE grade 1 vs 2-5	All patients (N=666)	27.4%
Diarrhea CTCAE grade 1 vs 2-5	All patients (n=619) Colitis grade 1 only N=136 Colitis grade 2-5 only, N=477	12.3% 18.1% 10.3%

CTCAE: Common Terminology Criteria for Adverse Events.

S721 ACG Governors Award for Excellence in Clinical Research (Trainee)

Impact of Holding Immunosuppressive Therapy in Patients With Inflammatory Bowel Disease (IBD) Around the Time of mRNA COVID-19 Vaccine Administration on Humoral Immune Response and Development of COVID-19 Infection

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Introduction: The BNT162b2 and mRNA-1273 vaccines are efficacious in patients with IBD; however, there is ongoing debate as to whether holding immunosuppressive therapy before and after immunization leads to better immune response. We sought to evaluate the effect of holding IBD medications around the time of vaccination on antibody response and subsequent COVID-19 infection.
Methods: We reviewed data collected from the prospective cohort, Partnership to Report Effectiveness of Vaccination in populations Excluded from iNitial Trials of COVID (PREVENT-COVID). Quantitative measurement of anti-receptor binding domain (anti-RBD) IgG antibodies to SARS-CoV-2 was performed 8 weeks after completing the vaccination series using the LabCorp Cov2Quant IgG assay. Patients were excluded if they were < 16 years, received the Ad26.COV2.S vaccine, on steroids, prior COVID-19 infection, or nucleocapsid antibody positive.
Results: A total of 1,768 patients were included; 69% with Crohn's disease and 73% females. 49% were on anti-TNF monotherapy, 11% on combination therapy (anti-TNF and immunomodulator), 11% on vedolizumab, and 14% on ustekinumab. 11% of participants held therapy before or after vaccine administration. Continuing versus holding anti-TNF before or after the second vaccine made no difference on anti-RBD antibody titer in those receiving BNT162b2 (9.9 mg/mL vs 10.2 mg/mL) or mRNA-1273 (17 mg/mL vs 14 mg/mL). There was also no difference in titer in those on combination therapy if therapy was continued or held (BNT162b2: 5.3 mg/mL vs 4 mg/mL; mRNA-1273: 15 mg/mL vs 18 mg/mL). Antibody titers in those on novel biologics (ustekinumab or vedolizumab) were higher compared to participants treated with other therapies and were increased in those that held therapy around the time of vaccination. However, the difference if drug was continued or held was not statistically significant (BNT162b2: 22 mg/mL vs 29 mg/mL, mRNA-1273: 51 mg/mL vs 88.5 mg/mL, respectively). Holding therapy was not associated with decreased rate of breakthrough COVID-19 infection compared to those not holding therapy (BNT162b2: 24% vs 24%; mRNA-1273 13% vs 20%). None of the participants were hospitalized for COVID-19. (Table)
Conclusion: Holding immunosuppressive therapy before or after mRNA COVID-19 vaccine dosing has no significant impact on anti-RBD antibody titers and does not impact the rate of breakthrough COVID-19 infections or hospitalizations. We recommend continuing IBD medications while receiving mRNA COVID-19 vaccination.

Table 1. Antibody titers based on whether IBD therapy was held before, after, or any time before or after second BNT162b2 and mRNA-1273 COVID-19 vaccine administration

Initial COVID-19 Antibody Titers by Whether Medication was Held Before Second Vaccine

	BNT162b2							mRNA-1273						
	Medication Held			Mediation Not Held			P value	Medication Held			Medication Not Held			P value
	Total N	Post Vaccination Titer Median IQR		Total N	Post Vaccination Titer Median IQR			Total N	Post Vaccination Titer Median IQR		Total N	Post Vaccination Titer Median IQR		
Anti-TNF	15	8.5	3.6, 19.0	426	9.9	4.5, 16.0	0.872	7	14	9.0, 24.0	228	17	9.7, 28.0	0.676
Combo therapy (TNF + thiopurine or MTX)	4	4.45	2.0, 10.2	110	5.1	2.3, 13.0	0.764	3	18	10.0, 23.0	73	15	6.7, 22.0	0.541
Novel Biologic (Uste or Vedo)	6	62	39.0, 161.0	264	22	13.0, 40.0	**0.038**	7	119	89.0, 203.0	167	51	28.0, 99.0	**0.026**
Thiopurine Only	4	12.65	8.3, 22.5	112	15	7.1, 23.5	0.976	4	55.5	38.5, 68.0	68	35.5	20.5, 66.0	0.434
Methotrexate Only	4	23	16.5, 105.0	22	18.5	13.0, 34.0	0.505	1	74	74.0, 74.0	15	69	21.0, 101.0	1.000
Tofacitinib	0	n/a	n/a	20	15	8.9, 19.0	-	2	47.5	21.0, 74.0	6	74.5	66.0, 78.0	0.632

Initial COVID-19 Antibody Titers by Whether Medication was Held After Second Vaccine

	BNT162b2						P value	mRNA-1273						P value
	Medication Held			Medication Not Held				Medication Held			Medication Not Held			
	Total N	Post Vaccination Titer Median IQR		Total N	Post Vaccination Titer Median IQR			Total N	Post Vaccination Titer Median IQR		Total N	Post Vaccination Titer Median IQR		
Anti-TNF	38	11	4.4, 19.0	403	9.8	4.5, 16.0	0.759	25	14	9.0, 27.0	210	17	9.7, 28.0	0.405
Combo therapy (TNF + thiopurine or MTX)	11	4	1.9, 6.4	103	5.3	2.3, 13.0	0.343	5	18	10.0, 23.0	71	15	6.7, 22.0	0.587
Novel Biologic (Uste or Vedo)	16	22.5	16.0, 49.0	254	22	13.0, 40.0	0.786	14	88.5	36.0, 119.0	160	51	28.5, 99.0	0.238
Thiopurine Only	4	9.65	8.3, 19.5	112	15	7.1, 23.5	0.763	5	49	28.0, 62.0	67	37	20.0, 69.0	0.732
Methotrexate Only	7	26	16.0, 148.0	19	19	11.0, 33.0	0.205	1	74	74.0, 74.0	15	69	21.0, 101.0	1.000
Tofacitinib	0	n/a	n/a	20	15	8.9, 19.0	-	2	47.5	21.0, 74.0	6	74.5	66.0, 78.0	0.632

Initial COVID-19 Antibody Titers by Whether Medication was Held Before or After Second Vaccine

	BNT162b2						P value	mRNA-1273						P value
	Medication Held			Medication Not Held				Medication Held			Medication Not Held			
	Total N	Post Vaccination Titer Median IQR		Total N	Post Vaccination Titer Median IQR			Total N	Post Vaccination Titer Median IQR		Total N	Post Vaccination Titer Median IQR		
Anti-TNF	42	10.15	4.4, 19.0	399	9.9	4.5, 16.0	0.833	27	14	9.0, 27.0	208	17.5	9.9, 28.5	0.255
Combo therapy (TNF + thiopurine or MTX)	13	4	1.9, 6.4	101	5.3	2.5, 13.0	0.369	5	18	10.0, 23.0	71	15	6.7, 22.0	0.587
Novel Biologic (Uste or Vedo)	22	29	18.0, 48.0	248	22	13.0, 40.0	0.285	14	88.5	36.0, 119.0	160	51	28.5, 99.0	0.238
Thiopurine Only	5	10	9.3, 16.0	111	15	7.0, 24.0	0.823	6	54.5	28.0, 62.0	66	35.5	20.0, 69.0	0.556
Methotrexate Only	8	23	17.0, 120.0	18	18.5	11.0, 33.0	0.213	1	74	74.0, 74.0	15	69	21.0, 101.0	1.000
Tofacitinib	0	n/a	n/a	20	15	8.9, 19.0	-	2	47.5	21.0, 74.0	6	74.5	66.0, 78.0	0.632

S722

Efficacy and Safety of Upadacitinib in Patients With Moderate to Severe Active Ulcerative Colitis Receiving 16 Weeks Extended Induction Treatment Followed by 52 Weeks Maintenance Treatment in U-ACHIEVE/U-ACCOMPLISH Trials

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Introduction: This analysis evaluated efficacy and safety of UPA after extended induction treatment(UPA 45mg QD for 16 wks) and subsequent maintenance treatment(UPA 15mg QD or UPA 30mg QD for 52 wks).

Methods: Patients who did not achieve clinical response(Adapted Mayo score decrease ≥2 points and ≥30% from baseline, plus ≥1 point decrease in rectal bleeding score [RBS] or absolute RBS ≤1) following initial 8 weeks (wks) UPA 45mg once daily (QD) treatment in induction trials were eligible to receive additional 8-wk, open-label extended treatment with UPA 45mg QD. Patients with clinical response following completion of the extended induction(Wk 16) were re-randomized 1:1 to UPA 15mg QD or UPA 30mg QD in U-ACHIEVE Maintenance trial(NCT02819635).

Results: Of patients who received UPA 45mg QD in the induction trials, 125 did not achieve clinical response at 8 wks and received further 8 wks induction treatment. At Wk 16, 73/125(58.4%) subsequently responded and were re-randomized to maintenance UPA 15mg QD or UPA 30mg QD. Among 16-wk responders who entered the maintenance trial, a greater proportion of patients who received UPA 30mg QD vs UPA 15mg QD achieved the primary endpoint of clinical remission at 52 wks(43.6% vs 26.5%, respectively), and secondary endpoints of clinical response(78.1% vs 49.1%, respectively) and endoscopic improvement(51.3% vs 34.3%, respectively) at 52 wks (Table). A similar pattern was seen across clinical, endoscopic, and histologic endpoints (Table). At Wk 52, the proportions of patients with serious adverse events(AEs) were 2.9% with UPA 15mg QD and 10.0% with UPA 30mg QD. Selected AEs of special interest with UPA 15mg QD and UPA 30mg QD included serious infection(2.9% vs 5.0% of patients, respectively), herpes zoster(0% vs 5.0%, respectively), adjudicated major adverse cardiovascular events(0% vs 2.5%, respectively), and non-melanoma skin cancer(NMSC; 0% vs 2.5%, respectively). No adjudicated venous thromboembolic events or cases of malignancy excluding NMSC were reported with UPA doses.

Conclusion: Extended induction treatment for further 8 wks with UPA 45mg QD induced response in over half of patients with UC who did not achieve a response after 8 wks. The benefit of maintenance therapy in delayed responders was shown with both UPA doses, though UPA 30mg QD provided greater benefit than UPA 15mg QD. UPA was well tolerated with no new safety signals and selected AEs of special interest were reported infrequently with both maintenance doses.

Table 1.

Primary and key secondary endpoints, %	UPA 45 mg QD at Week 16 (induction)[a] (N=125)	UPA 15 mg QD at Week 52 (maintenance)[b] (N=34)	UPA 30 mg QD at Week 52 (maintenance)[b] (N=39)
Primary endpoint: Clinical remission[c]	5.6	26.5	43.6
Clinical response[d]	58.4	(N=25) 49.1	(N=32) 78.1
No abdominal pain	40.0	38.2	48.7
No bowel urgency	30.4	32.4	59.0
Endoscopic improvement[e] Endoscopic remission[f]	14.3 4.9	34.3 12.2	51.3 17.9
Histologic-endoscopic mucosal improvement[g] Mucosal healing[h]	11.0 3.4	21.9 12.0	41.0 12.8
Among patients who achieved clinical remission at the end of induction: Clinical remission[c] Clinical remission[c] and corticosteroid free for ≥90 days immediately prior to Week 52	 N/A N/A	(N=3) 0 0	(N=4) 100 100
Among patients who achieved endoscopic improvement at the end of induction: Endoscopic improvement[e]	N/A	(N=7) 42.9	(N=9) 66.7

Data are presented for the ITT population comprising patients who achieved a clinical response with 16-week UPA 45 mg QD induction therapy and were re-randomized to receive UPA 15 mg or 30 mg QD maintenance therapy.
[a]Two patients were excluded from analysis owing to site non-compliance as prespecified in the statistical analysis plan.
[b]Included patients who had completed, or had the potential to complete, 52 weeks' maintenance treatment.
[c]Per Adapted Mayo score ≤2: stool frequency subscore ≤1 and not greater than induction baseline, RBS=0, and ES ≤1.
[d]Induction therapy (UPA 45 mg QD): Clincal response, defined as a decrease in Adapted Mayo score ≥2 and ≥30% from induction baseline, plus a decrease in RBS ≥1 or an absolute RBS ≤1, at Week 16. Maintenance therapy (UPA 15 mg or 30 mg, QD): Maintenance of clinical response at Week 52 among patients who achieved clinical response at the end of the 16-week induction therapy.
[e]ES ≤1.
[f]ES=0.
[g]ES ≤1 and Geboes score ≤3.1.
[h]ES=0 and Geboes score < 2.
ES, endoscopic subscore; ITT, intent-to-treat; N/A, not applicable; QD, once daily; RBS, rectal bleeding subscore; UPA, upadacitinib.

S723

Duration of Response to Ozanimod After Treatment Withdrawal: Results From the Phase 3 True North Study

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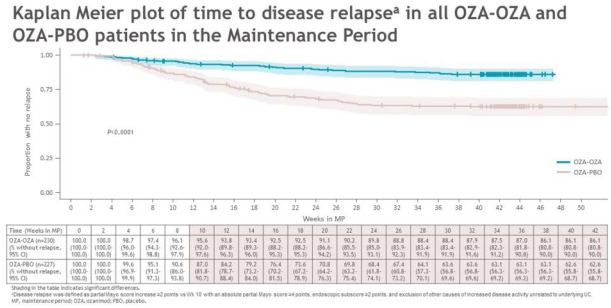
Introduction: The phase 3 True North (TN) randomized trial demonstrated efficacy and safety of ozanimod (OZA) in patients (pts) with moderately to severely active ulcerative colitis (UC). Temporary discontinuation of UC treatment can occur in clinical practice. Understanding the duration of response after treatment discontinuation can assist in clinical decision making. This analysis examined time to loss of OZA response in pts who discontinued OZA and switched to placebo (PBO) in the TN maintenance period (MP).
Methods: In TN, pts were randomized to once-daily oral OZA 0.92 mg or PBO or to open-label OZA during a 10-week induction period (IP). Pts with clinical response to OZA at Week 10 were rerandomized to OZA (OZA-OZA) or PBO (OZA-PBO) in the MP through Week 52. Disease relapse was defined as an increase in partial Mayo score (PMS) of ≥2 points vs Week 10 with absolute PMS ≥4, endoscopic subscore ≥2, and exclusion of other causes of increased disease activity unrelated to UC. A subanalysis compared outcomes in OZA-OZA and OZA-PBO pts who entered the MP after achieving clinical remission (CRM) or clinical response (CRS only, excluding pts in CRM) at Week 10.
Results: In the TN MP, 230 pts continued OZA (CRM, n=82; CRS only, n=148) and 227 pts switched to PBO (CRM, n=79; CRS only, n=148). Baseline characteristics were generally similar between groups. Pts in CRS only at Week 10 had a numerically higher proportion with severe disease and prior immunosuppressive medication use vs CRM pts (Table). Differences in disease relapse between groups became apparent after MP Week 8, after which a significantly higher proportion of OZA-OZA pts were without relapse vs OZA-PBO pts (Figure). MP Week 42 Kaplan-Meier (KM) estimates of no relapse were 86.1% and 62.6% for OZA-OZA and OZA-PBO pts, respectively. Additionally, pts in CRM at Week 10 had higher rates of nonrelapse during the MP vs those in CRS only at MP entry. KM estimates of non-relapse at MP Week 42 were 67.9% and 59.7% in OZA-PBO pts with CRM and CRS, respectively, and 90.9% and 83.4% in OZA-OZA pts with CRM and CRS, respectively.
Conclusion: This analysis shows that OZA is effective at preventing disease relapse over 42 weeks of maintenance treatment in pts who achieve clinical response at Week 10. These data show that OZA maintains disease control even in the event of temporary discontinuation. However, extended discontinuation should be minimized in clinical practice.



[0723] **Figure 1.**

Table 1. Baseline characteristics in pts in CRM vs pts in CRS only at Week 10

	Pts in CRM[a] at IP Week 10		Pts in CRS[b] only at IP Week 10	
	OZA-PBO (n=79)	OZA-OZA (n=82)	OZA-PBO (n=148)	OZA-OZA (n=148)
Age, years, mean ± SD	45.0 ± 13.5	42.7 ± 13.9	42.0 ± 13.8	42.3 ± 13.4
Males, n (%)	45 (57.0)	41 (50.0)	77 (52.0)	76 (51.4)
Years since UC diagnosis, mean ± SD	7.3 ± 7.0	7.4 ± 7.2	7.2 ± 7.3	8.9 ± 7.4
Prior therapies, n (%)				
5-ASA	75 (94.9)	81 (98.8)	146 (98.6)	146 (98.6)
CS	51 (64.6)	54 (65.9)	117 (79.1)	109 (73.6)
Immunomodulator	24 (30.4)	26 (31.7)	61 (41.2)	63 (42.6)
Anti-TNF	13 (16.5)	15 (18.3)	52 (35.1)	61 (41.2)
Non-anti-TNF biologic	3 (3.8)	9 (11.0)	30 (20.3)	33 (22.3)
Complete Mayo score[c] >9, n (%)	12 (15.2)	19 (23.2)	51 (34.5)	76 (51.4)
Mayo endoscopic score = 3 (severe), n (%)	22 (27.8)	25 (30.5)	94 (63.5)	107 (72.3)
Fecal calprotectin, median IQR, mg/kg	1027.8 (295.0, 2689.3)	851.6 (251.4, 2694.6)	1085.2 (434.4, 2579.3)	1285.0 (486.5, 2673.4)

All data are reported at IP baseline.
[a]CRM was defined as complete Mayo score of ≤2 with no individual subscore of >1 point.
[b]CRS was defined as decrease from baseline of ≥3 points and at least 30% in the complete Mayo score and a decrease of ≥1 in RBS or an absolute RBS of ≤1.
[c]The sum of the rectal bleeding subscore, stool frequency subscore, Physician's Global Assessment subscore, and endoscopy subscore.
ASA, aminosalicylic acid; CRM, clinical remission; CRS, clinical response; CS, corticosteroid; IP, induction period; SD, standard deviation; TNF, tumor necrosis factor.

S724 Presidential Poster Award

Insurance Companies' Poor Adherence to ACG/AGA Guidelines for Moderate to Severe Ulcerative Colitis and Crohn's Disease Management

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Introduction: Management of moderate-to-severe ulcerative colitis (UC) and Crohn's disease (CD) has shifted from step-up therapy to induction of remission with a biologic agent based on disease severity. We sought to assess if current insurance company policies meet the latest guidelines from the ACG and AGA for UC and CD management.
Methods: The top 50 insurance companies were searched for publicly available policy information for infliximab, adalimumab, vedolizumab, tofacitinib, and ustekinumab. Data extracted included authors, date of last revision, citation of AGA/ACG guidelines, and policy requirements. Additionally, data regarding need to fail conventional therapy, use of biosimilars, and use of 1st line biologic agents was obtained. The data was compared to the 2018 ACG and 2020 AGA guidelines for UC, and the 2019 ACG and 2021 AGA guidelines for CD.
Results: Of the top 50 insurance companies, 48 provided health coverage. Of those, 33 (72.34%) had publicly accessible policies on the coverage of biologics. No authors of the policies were listed. ACG/AGA guidelines were directly quoted or cited in 70.6% of policies. Policies were updated from 1/1/2016 to 5/31/2022. Of the 34 policies that were analyzed, only 58.8% of policies were consistent with the ACG guidelines for CD vs 8.8% to AGA guidelines (Table). Additionally, only 14.7% and 17.7% of policies permitted any first-line biologic therapy in CD and in UC respectively.
Conclusion: As of 2022, insurance companies that comprise nearly 80% of the market are yet to adopt the most current guidelines for IBD management. Nearly every insurance company requires the failure of "conventional" therapies such as 5-ASAs, immunomodulators, and corticosteroids. The time required to determine therapeutic failure was inconsistent – ranging from 7 days to 6 months. The large difference between adherence to ACG vs AGA guidance for CD is due to the difference in recommendations for use of an immunomodulator vs anti-TNF as first line agent, as well as length of treatment with corticosteroids before failure (short term therapy vs 3-5 days). The second most common reason for guideline non-adherence was the inability to use immunomodulators concurrently with biologics. Finally, first-line biologic medications were limited primarily to adalimumab or infliximab. Further work is needed to better understand the implications of these inconsistencies between insurance companies and formal medical guidelines on outcomes for patients with moderate-to-severe UC and CD.

Table 1. Adherence to Published Professional Society Guidelines

Metric	Ulcerative Colitis	Crohn's disease
ACG Guidelines (2018, 2019)	3/34 (8.8%)	20/34 (58.8%)
AGA Guidelines (2020, 2021)	3/34 (8.8%)	2/34 (5.8%)
Any first line biologic (infliximab, adalimumab, vedolizumab)	5/34 (14.7%)	6/34 (17.7%)
Requirement to fail at least one conventional therapy	31/34 (91%)*	31/34 (91%)**

*Certain policies have exceptions including hospitalization for UC.
**Certain policies have exceptions including fistulizing disease for CD.

S725 Presidential Poster Award

linical Utility of Precision-Guided Dosing Tool for Infliximab During Maintenance Therapy of Inflammatory Bowel Disease

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Introduction: A precision-guided dosing tool that uses Bayesian data assimilation was developed to forecast Infliximab (IFX) exposure. Our objective was to establish the utility of the tool in clinical decision making during IFX maintenance therapy when used reactively, to address inadequate disease control that results from suboptimal exposure, and proactively, to sustain exposure commensurate with disease remission in inflammatory bowel disease (IBD).
Methods: Blood specimens were collected, anytime beyond 20 days after a prior infusion in a prospective study (EMPOWER). Pharmacokinetic (PK) testing was conducted at Prometheus Laboratories (San Diego, CA). Serum IFX, antibodies to IFX (ATI) and albumin concentrations were all imputed with dosing regimen and weight in a Bayesian data assimilation tool to produce individualized PK profiles that forecasted IFX concentration and time to trough concentration below pre-specified thresholds (e.g., < 10 μg/mL). Forecasted exposure at various dosing regimens was also provided. Physician's global assessment of disease activity was collected with the decision to change IFX dosing that resulted from PK test results. Statistical analysis consisted of Mann-Whitney and Fisher Exact test as appropriate.

Results: A total of 111 patients were assessed by 21 physicians. A change in IFX dose regimen was initiated in 51 patients (46%). Inadequate exposure and forecasted IFX levels below 10 μg/mL associated with dose intensification (76%, median IFX 6.3 μg/mL) ($p< 0.01$), with lower remission rate (23.5%) achieved in that group as compared to two other groups having better disease control and PK profiles ($p< 0.001$) (Table). Forecasted IFX levels below 10 μg/mL were associated with 4-fold higher likelihood of active disease (OR=4.1; 95%CI: 1.7-9.4) as compared to IFX levels above 10 μg/mL ($p< 0.01$). Time to trough below 10μg/mL was shorter in active disease (median: 46 days, IQR: 32-59) than in remission (median 57 days, IQR: 48-69) ($p< 0.001$). As presented in Figure, dose intensification using a 5 mg/kg every 4 weeks dosing regimen forecasted 2.3-fold higher IFX levels as compared to a 10 mg/kg every 8 weeks dosing regimen (median of 17.1 vs 7.4 μg/mL, respectively) ($p< 0.001$). Similar results were observed among patients presenting with disease remission.

Conclusion: Our study suggests that the precision-guided dosing tool provides clinical utility and helps with dose adjustments in both interval changes as well as dose intensification.

Forecasted IFX levels (μg/mL), active disease group (median, N=66)

	5 mg/Kg	7 .5 mg/Kg	10 mg/Kg
4 weeks	17.1	25.3	35.1
6 weeks	7.2	11.0	15.0
8 weeks	4.1	5.9	7.4

Forecasted IFX levels (μg/mL), disease remission group (median, N=45)

	5 mg/Kg	7 .5 mg/Kg	10 mg/Kg
4 weeks	23.6	34.7	48.6
6 weeks	11.2	16.6	22.2
8 weeks	6.0	8.5	11.8

[0725] **Figure 1.** Forecasted IFX Exposure at various dose and interdose intervals, given the individual PK parameters

Table 1. Patient Characteristics (n=111), by treatment intervention based on test results

Variable	IFX Dose Regimen Reduction N=17	IFX Dose Regimen Continuation N=60	IFX Dose Regimen Intensification N=34	Overall Population N=111
Patient Characteristics				
Age (years)	16 (14-19)	32 (18-45)	32 (17-46)	26 (16-44)
Female (%, n/N)	44.1% (7/17)	43.3% (26/60)	44.1% (15/34)	43.2% (48/111)
CD/UC/Indeterminate	13/3/1	36/15/8	22/9/3	71/27/12
Weight (Kg)	64 (43-76)	71 (61-92)	69 (61-92)	70 (60-84)
Dose mg/Kg	10.0 (9.0-10.4)	8.2 (5.0-10.0)	5.5 (5.0-10.0)	8.0 (5.1-10.0)
Interdose interval (weeks)	6 (5-8)	8 (6-8)	8 (6-8)	8 (6-8)
PGA Remission Status, remission (%, n/N)	70.6% (12/17)	41.7% (25/60)	23.5% (8/34)	40.5% (45/111)
Clinical PK Measurements				
Measured IFX levels (μg/mL)	23.3 (17.2-28.5)	12.9 (7.2-20.6)	8.0 (5.2-14.7)	12.5 (7.2-20.9)
ATI status (%, n/N)	0% (0/17)	10.0% (6/60)	11.8% (4/34)	9.0% (10/111)
Albumin (g/dL)	4.1 (4.0-4.3)	4.0 (3.6-4.2)	3.9 (3.7-4.2)	4.0 (3.7-4.2)
Clearance (L/day)	0.19 (0.15-0.22)	0.27 (0.20-0.33)	0.28 (0.22-0.35)	0.25 (0.19-0.31)
Time to Trough < 10 μg/mL (weeks)	11 (10-12)	7 (6-9)	6 (4-7)	7 (6-9)
Forecasted Trough (μg/mL)	26.2 (20.1-34.5)	12.7 (8.6-17.6)	6.3 (3.1-9.4)	11.6 (6.5-19.5)
Forecasted Trough < 10 μg/mL	0% (0/17)	31.7% (19/60)	76.5% (26/34)	40.5% (45/111)

S726 Presidential Poster Award

Fecal Transplantation Improved Patients' Reported Outcome After Immune Checkpoint Inhibitor Colitis

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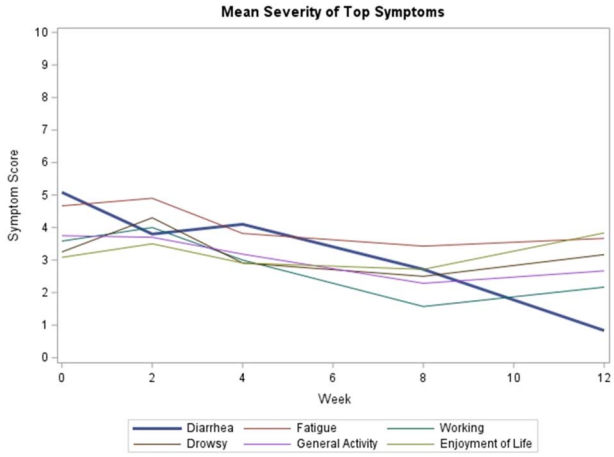
Introduction: Immune checkpoint inhibitors (ICIs) have become standard treatment for cancers poorly responsive to traditional chemotherapy. The most common GI toxicity of this class of drugs is ICIs colitis (IMC) associated with difficulty to treat chronic diarrhea and risk of fatality. We have previously demonstrated that fecal microbiota transplantation (FMT) was effective in the treatment of a small number of refractory cases suggesting the gut microbiome is involved in the pathogenesis of ICIs colitis. Further large studies are needed to determine its efficacy.

Methods: The present study summarizes our experience with FMT treatment of 37 patients with refractory ICIs colitis. We measured the efficacy of FMT and patients' reported outcome (PRO) via established MD Anderson Symptom Inventory (MDASI). Among them, 9 patients had concurrent CDI as well at the time of diagnosis. (Table)

Results: Thirty-seven patients included in our study, with a median age of 59 years and mostly had genitourinary cancers (35.1%) followed by melanoma (27.0%). Most patients had a peak CTCAE diarrhea grade ≥ 3 (91.9%) and colitis grade ≥ 2 (89.1%). Ulcerous (18, 48.6%) and non-ulcerous (12, 32.4%) inflammation was predominant endoscopic findings. 36 (97.3%) patients received corticosteroids, and 33 (89.1%) received add-on infliximab or vedolizumab. IMC symptom response was 83.7% after FMT with median time to response of 5 days. The rate of complications is 16.2% at 7 days and 5.4% at 30 days, and mostly were transient and mild. Response rate among 28 patients without concurrent CDI was 85.7%. Thirty-five (94.6%) patients demonstrated colitis remission at the last follow up. On the PRO analysis, we observed a favorable trend of significant patient-reported symptom reduction on diarrhea during 12 weeks after FMT, along with improved daily physical functioning on working. (Figure)

Conclusion: Evidence is accumulating to suggest that efficacy and prevention of ICI related toxicities is dependent upon a healthy diverse microbiome. In the present study, we have shown that FMT achieved 83.7% success rate in patients with IMC with a favorable safety profile. FMT could become a preferred treatment option for the IMC in the future practice.



[0726] **Figure 1.** Patients Reported Outcome Summary

Table 1.

Characteristic before FMT	No. (%) (n=37)
Concurrent CDI#	9 (24.3%)
Highest grade of diarrhea of initial IMC onset – no. (%)	
1 or 2	3 (8.1%)
3 or 4	34 (91.9%)
Highest grade of colitis of initial IMC onset – no. (%)	
1	4 (10.8%)
2- 4	33 (89.2%)
Initial endoscopic findings – no (%), n=36	
Ulcers	18 (48.6%)
Non-ulcer inflammation	12 (32.4%)
Normal	6 (16.2%)
Hospitalizations – no. (%)	29 (78.3%)
Median duration of hospitalization – days (IQR)	8 (5-13)
Treatment of GI adverse events – no. (%)	
Steroid	36 (97.3%)
Infliximab/vedolizumab added	33 (89.1%)
FMT characteristic and outcome	
Symptom improvement after FMT, all patients – no (%)	31 (83.7%)
Symptom improvement after FMT (no concurrent CDI, n=28) – no (%)	24 (85.7%)
Median time from FMT to symptom improvement– days (IQR), n=37	5 (2-10)
FMT-related complications within 7 days –no (%)	6 (16.2%)
FMT-related complications within 30 days –no (%)	2 (5.4%)
Colitis status at the end of the study period	
Clinical remission – no (%)	35 (94.6%)
Persistent symptoms – no (%)	2 (5.4%)

S727 Presidential Poster Award

Endoscopic Disease Activity and Biologic Therapy Are Independent Predictors of Suboptimal Bowel Preparation in Patients With Inflammatory Bowel Disease Undergoing Colonoscopy: A Multicenter Analysis

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Introduction: Optimal bowel preparation (BP) is critical for endoscopic assessment of inflammation and dysplasia in patients with inflammatory bowel disease (IBD). Comorbidities and patient-related factors have been associated with sub-optimal BP (SOBP) in the general population. Using a multicenter database, we sought to identify disease-specific characteristics that may impact the quality of BP in patients with IBD.

Methods: We conducted a retrospective analysis of adult IBD patients who underwent outpatient colonoscopies between January 2011 and October 2021 at three large academic medical centers. Patients with total colectomy or those undergoing only sigmoidoscopy were excluded. Quality of BP was documented using the Boston Bowel Preparation Scale (BBPS) or the Aronchick scale and dichotomized into "sub-

optimal" (BBPS 0-5 or Aronchick "fair", "poor", unsatisfactory") and "optimal" (BBPS 6-9 or Aronchick "excellent", "good"). The primary objective was to evaluate IBD-specific factors associated with SOBP. Independent associations were calculated using multivariable backward stepwise regression models.

Results: Among a total of 1154 IBD patients [53% females, mean age 47±17 years, 58% with Crohn's disease (CD), 40% with ulcerative colitis (UC), 23% with moderate-to-severe disease, 40% receiving biologic therapy], 23.5% (N=271) had SOBP. 69% of patients received a low-volume prep (≤2L) and 80% received it in a split-dose format. Cecal or anastomotic intubation was achieved in 94% of patients. On multivariable analysis, moderate-to-severe endoscopic disease versus mild or inactive disease was associated with a higher odds of SOBP [OR 2.34 (1.60-3.43)] whereas baseline biologic use was associated with a lower odds of SOBP [OR 0.67 (0.47-0.96)] among the overall IBD cohort. Additionally, age >65 years [OR 1.80 (1.11-2.90)] and hypertension [OR 1.73 (1.06-2.82)] predicted higher odds, and split-dose (vs single-dose) BP [OR 0.52 (0.32-0.83)] predicted a lower odds of SOBP among IBD patients (Figure 1-A). In the subgroup analysis, biologic therapy use, age >65 years, and split-dose BP were predictors of SOBP in both UC and CD subgroups, whereas stricturing phenotype predicted SOBP among the CD cohort (Figure 1-B,C).

Conclusion: Endoscopic disease activity was predictive of SOBP, and biologic therapy was protective against SOBP among IBD patients. Improved inflammatory control using biologic therapies may also improve quality of BP among IBD patients undergoing colonoscopy.

FIGURE 1: MULTIVARIABLE ANALYSIS OF FACTORS ASSOCIATED WITH SUBOPTIMAL BOWEL PREPARATION

Variable		Adjusted OR (95% CI)	P value
(A) Overall IBD Cohort			
Age>65 years		1.80 (1.11-2.90)	**0.016**
Moderate-severe endoscopic disease vs. mild or inactive disease		2.34 (1.6-3.43)	**<0.001**
Biologic therapy use		0.67 (0.47-0.96)	**0.023**
Comorbid conditions	Hypertension	1.73 (1.06-2.82)	**0.031**
	CAD/CHF	1.26 (0.7-2.27)	0.450
	CVA	1.58 (0.54-4.65)	0.408
	Anxiety/Depression	1.28 (0.83-1.97)	0.270
	Hypothyroidism	1.17 (0.61-2.27)	0.637
	Colorectal cancer	1.50 (0.25-8.84)	0.656
Medication use	Antidepressants	1.56 (0.67-3.63)	0.305
	Opiates	1.49 (0.65-3.42)	0.343
Split prep		0.52 (0.32-0.83)	**0.007**
Low volume prep		0.85 (0.54-1.34)	0.488
(B) Ulcerative Colitis Subgroup			
Age>65 years		2.08 (1.01-4.26)	**0.046**
Moderate-severe endoscopic disease vs. mild or inactive disease		2.53 (1.37-4.69)	**0.003**
Biologic therapy use		0.51 (0.27-0.98)	**0.044**
Comorbid conditions	Hypertension	1.65 (0.82-3.29)	0.159
	Antidepressant use	4.37 (1.26-15.22)	**0.020**
Split prep		0.48 (0.27-0.86)	**0.014**
(C) Crohn's Disease Subgroup			
Age>65 years		2.15 (1.12-4.16)	**0.022**
Biologic therapy use		0.62 (0.39-0.98)	**0.043**
Comorbid conditions	Hypertension	2.03 (1.13-3.63)	**0.018**
	Antidepressant use	1.57 (0.9-2.75)	0.115
Split prep		0.42 (0.26-0.69)	**0.001**
CD colitis		1.61 (0.97-2.67)	0.065
Stricturing phenotype (B2)		3.45 (2.1-5.65)	**<0.001**

P values <0.05 are in bold

CAD/CHF: history of coronary artery disease or congestive heart failure; CD: Crohn's disease; CI: confidence interval; IBD: inflammatory Bowel Disease; OR: odds ratio

[0727] **Figure 1.** (A, B, C) Multivariable analysis of factors associated with suboptimal bowel preparation in patients with IBD

S728 Presidential Poster Award

Risk of Avoidant/Restrictive Food Intake Disorder Prevalence Among Underrepresented Minority Patients With Inflammatory Bowel Disease

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Introduction: In avoidant/restrictive food intake disorder (ARFID), a newer diagnosis included in the DSM-5, food intake is restricted or avoided based on a disinterest in food, characteristics, or negative experiences associated with food. Recent studies have shown a significantly higher rate of ARFID in patients with inflammatory bowel disease (IBD)[1] though these studies have lacked racial and ethnic diversity. Our study aimed to determine if Under Represented Minority (URM) patients with IBD have differing risk for ARFID compared with Caucasian patients.

Methods: In this single center, cross sectional study performed at the Clinic for Digestive Diseases at Boston Medical Center, adult patients who carried either a diagnosis of Crohn's disease (CD) or ulcerative colitis (UC) were consented to participate during their office visits. They were administered a Nine Item ARFID Screen (NIAS) and either the Simple Clinical Colitis Index (SCCAI) for UC or the Harvey-Bradshaw Index (HBI) for CD. A score equal to or higher than 24 on the NIAS was considered positive screening for risk of ARFID.[2]

Results: 11/59 (18.6%) UC patients screened positive for risk of ARFID, while 17/83 (20%) CD patients screened positive. CD patients with a positive risk for ARFID had an average HBI score of 5.4 vs CD patients with low risk for ARFID (average HBI score of 2.3 (p=0.0067)). NIAS + UC patients had an average SCCAI score of 4.4 vs NIAS – UC patients (average SCCAI score of 2.9 (p=0.04)). URMs had a slightly higher risk for ARFID vs. Caucasians (11/49 (22%) vs 17/86 (19%)). When comparing average NIAS scores among the two populations, Black and Hispanic patients had an average score of 17.04 while Caucasian patients had an average score of 14.05 (p=0.082). (Figure)

Conclusion: Prior studies have noted higher rates of ARFID among Caucasian patients with IBD.[1] This study demonstrates that both Caucasian and URM patients with IBD have higher risk for ARFID compared to the general population. Patients with more active CD also had higher NIAS scores. There was a trend toward higher average NIAS scores in URM patients compared to Caucasian patients. Further studies to identify reasons for this trend, such as possible cultural differences in diet addressed during office visits, should be explored.

	NIAS Respondents
Total	142
Average Age (+/- Standard deviation)	44.52 +/- 15.88
Female (%)	71 (50%)
Caucasian	86 (60.5%)
Hispanic/Latino	27 (19%)
Black/African American	22 (15.5%)
Asian	5 (4%)
American Indian/Alaskan Native	2 (1%)
Crohn's (%)	83 (58%)
UC (%)	59 (42%)
Avg SCCAI	3.1
Avg HBI	2.94

[0728] **Figure 1.** General Demographic Information

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S729 Presidential Poster Award

Serum Ustekinumab Concentrations Are Associated With Improved Outcomes With the Magnetic Resonance Index of Activity for Crohn's Disease

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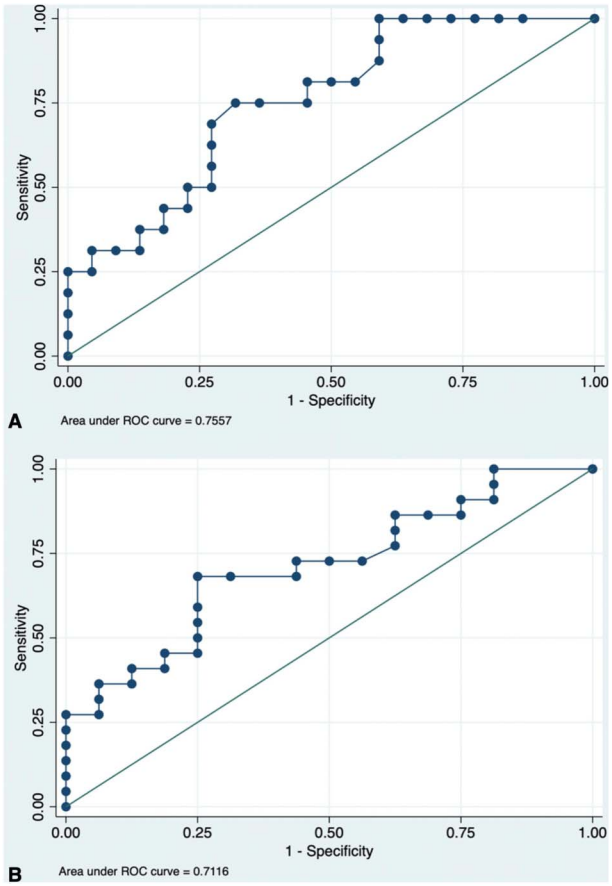
Introduction: Controversy exists for ustekinumab concentrations needed in Crohn's disease (CD). No data exist comparing ustekinumab concentrations and validated radiologic outcomes. We characterized these relationships and clarified concentrations needed.
Methods: CD patients on maintenance (> 16 weeks) ustekinumab with both ustekinumab concentrations and simplified magnetic resonance index of activity (sMaRIA) scoring were included. Ustekinumab concentrations were compared between those with and without (1) radiologic remission (sMaRIA < 2), (2) severe radiologic inflammation (sMaRIA < 3) and (3) fecal calprotectin (FCP) biomarker remission (FCP < 50 μg/g). Area under the receiver-operating characteristic (AUROC) curve determined optimal ustekinumab concentrations. Outcomes were compared between patients above and below identified ustekinumab thresholds.
Results: Thirty-eight paired ustekinumab concentrations and MRE were included. Ustekinumab concentrations were higher with radiologic remission (11.4 μg/mL vs. 6.4 μg/mL, P=.005) and had good diagnostic accuracy for radiologic remission (AUROC 0.76, 95% CI 0.60 – 0.91) and for absence of severe inflammation (AUROC 0.71, 95% CI 0.55 – 0.88, optimal concentration 8.4 μg/mL). With ustekinumab ≥ 8.4 μg/mL, higher proportions had radiologic remission (63.2% vs. 21.1%, P=.01) and absence of severe inflammation (78.9% vs. 36.8%, P=.01) compared to patients with lower concentrations. Ustekinumab concentrations had good diagnostic accuracy (AUROC 0.73, 95% CI 0.52 – 0.94) for FCP biomarker remission (optimal concentration: 6.1 μg/mL). Patients with ustekinumab concentrations ≥ 6.1 μg/mL had higher proportions with biomarker remission (72.2% vs. 12.5% P < .01) compared to those with lower concentrations. (Figure)
Conclusion: Ustekinumab concentrations are associated with radiologic and biomarker outcomes in CD. These data validate the need for higher ustekinumab concentrations.



[0729] **Figure 1.** (A) Receiver-operating characteristic curve analysis for sMaRIA score of < 2, absence of any inflammation, based on ustekinumab trough concentrations. The optimal concentration is 8.4 μg/mL as indicated by the best receiver-operating characteristic curve (area under curve, 0.76; sensitivity, 75%; specificity 68%). (B) Receiver-operating characteristic curve analysis for sMaRIA score of < 3, absence of severe inflammation, based on ustekinumab concentrations. The optimal serum concentration is 8.4 μg/mL as indicated by the best receiver-operating characteristic curve (area under curve, 0.71).

S730

Ozanimod Is an Efficacious Oral Therapy After 5-ASA Failure in Immunomodulator- and Biologic-Naive Patients With Ulcerative Colitis: Post Hoc Analysis From True North

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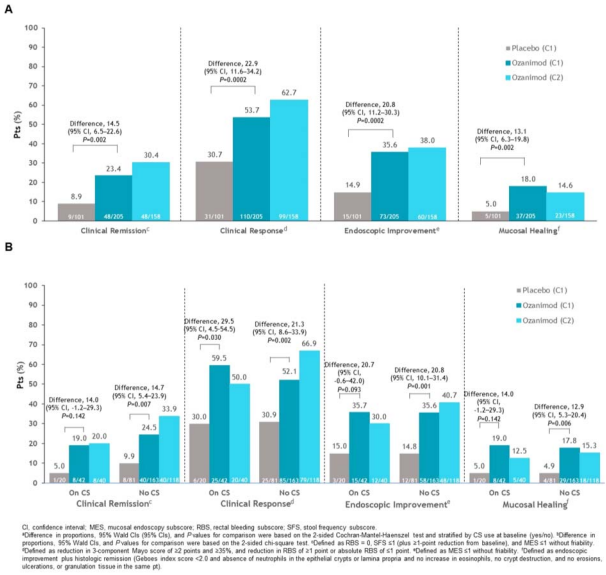
Introduction: Oral 5-ASAs and corticosteroids (CSs) are often first-line treatment for UC, and pts who fail these agents typically advance to immunosuppressives or biologics. Ozanimod (OZA), an oral S1P receptor modulator, is approved in the United States and EU for treating adults with moderately to severely active ulcerative colitis (UC). This post hoc analysis from the phase 3 True North (TN) randomized controlled trial evaluated the efficacy of OZA at Week 10 (end of induction) in immunomodulator- and biologic-naive pts with moderate to severe UC who failed 5-ASA with or without concomitant CSs.
Methods: TN consisted of a 10-week induction period. Pts in Cohort (C) 1, stratified by CS use at screening, were randomized to OZA 0.92 mg (equivalent to OZA HCl 1 mg; n=429) or placebo (PBO; n=216) once daily in a double-blind manner; pts in C2 (n=367) received open-label (OL) daily OZA 0.92 mg. At enrollment, pts were required to be on stable doses of oral 5-ASA and/or CSs for ≥2 weeks and continued on the same dose throughout induction. Pts who received tofacitinib within 2 weeks of screening were excluded. This analysis focused on clinical remission, clinical response, endoscopic improvement, and mucosal healing efficacy outcomes in immunomodulator- and biologic-naive, 5-ASA–exposed pts.
Results: Of 464 pts treated with 5-ASA who were immunomodulator- and biologic-naive, with or without CSs, 205 received OZA and 105 received PBO in C1; 158 pts received OL OZA in C2. Baseline characteristics were similar between groups in C1. Compared with PBO at Week 10, a higher proportion of OZA-treated pts achieved clinical remission (23.4% v 8.9%), clinical response (53.7% v 30.7%), endoscopic improvement (35.6% v 14.9%), and mucosal healing (18.0% v 5.0%) (Figure A) in this subgroup. These results are consistent with previously published results of the overall study population,[1] which demonstrated that significantly greater proportions of pts who received OZA v PBO achieved clinical remission (18.4% v 6.0%), clinical response (47.8% v 25.9%), endoscopic improvement (27.3% v 11.6%), and mucosal healing (12.6% v 3.7%). All efficacy endpoints were achieved by a greater proportion of pts receiving OZA v PBO regardless of CS use at baseline (Figure B). Results were similar for OL OZA-treated pts in C2.
Conclusion: OZA demonstrated efficacy at Week 10 in immunomodulator- and biologic-naive pts with UC who had failed 5-ASA, regardless of CS use at baseline.

Figure 1. Efficacy of OZA vs PBO in immunomodulator- and biologic-naive, 5-ASA–exposed pts **(A)** at Week 10 (induction period)[a] and **(B)** at Week 10 (induction period) by CS usage at baseline[b]



CI, confidence interval; MES, mucosal endoscopy subscore; RBS, rectal bleeding subscore; SFS, stool frequency subscore.
[a]Difference in proportions, 95% Wald CIs (95% CIs), and *P*-values for comparison were based on the 2-sided Cochran-Mantel-Haenszel test and stratified by CS use at baseline (yes/no). [b]Difference in proportions, 95% Wald CIs, and *P*-values for comparison were based on the 2-sided chi-square test. [c]Defined as RBS = 0, SFS ≤1 (plus ≥1-point reduction from baseline), and MES ≤1 without friability. [d]Defined as reduction in 3-component Mayo score of ≥2 points and ≥35%, and reduction in RBS of ≥1 point or absolute RBS of ≤1 point. [e]Defined as MES ≤1 without friability. [f]Defined as endoscopic improvement plus histologic remission (Geboes index score <2.0 and absence of neutrophils in the epithelial crypts or lamina propria and no increase in eosinophils, no crypt destruction, and no erosions, ulcerations, or granulation tissue in the same pt).

[0730] **Figure 1.**

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S731

Ozanimod Is an Effective Oral Treatment for Patients With Ulcerative Colitis Regardless of Baseline Endoscopic Disease Distribution: A Post Hoc Analysis of the Phase 3 True North Study

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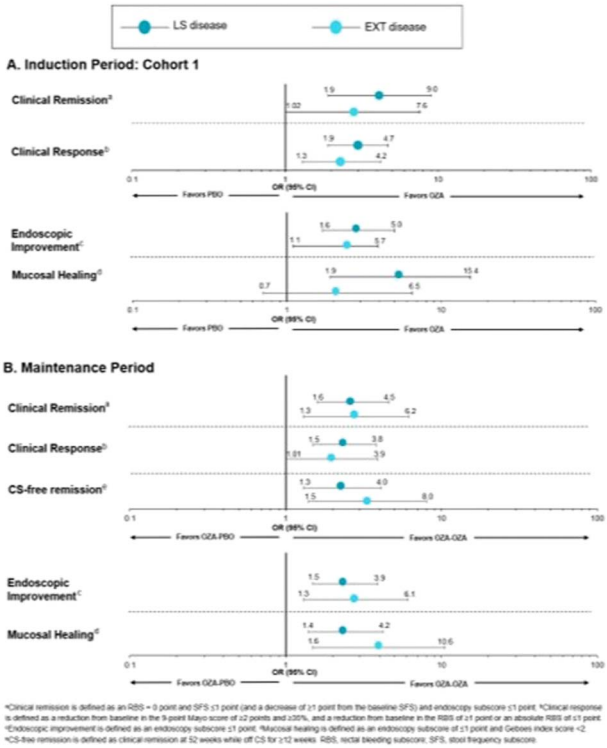
Introduction: Ozanimod (OZA), an oral $S1P_1$ and $S1P_5$ receptor modulator, is effective and well tolerated in the treatment of moderate to severely active ulcerative colitis (UC) patients (pts). OZA is approved in this pt population based on results of the phase 3, randomized, double-blind, placebo (PBO)-controlled True North (TN; NCT02435992) study. Disease extent may influence treatment outcomes, including clinical symptoms and colectomy risk. Consequently, this post hoc analysis of TN explored the effect of baseline disease extent on OZA efficacy.

Methods: In TN, pts were randomized to OZA 0.92 mg once daily or PBO (Cohort 1) or to open-label OZA (Cohort 2) for a 10-wk induction period (IP). OZA clinical responders were rerandomized at Week (W) 10 to OZA or PBO for a 42-wk maintenance period (MP). Efficacy was assessed at W10 and W52, subgrouped by disease extent at baseline (BL; left-sided [LS] or extensive [EXT] colitis).

Results: BL demographics and disease characteristics were similar in LS and EXT UC pts. OZA was more effective than PBO in pts with LS and EXT disease distribution at W10 and W52 for all clinical outcomes (**Table**). At W52, corticosteroid (CS)-free remission was achieved in 30.9% and 17.2% OZA-OZA and OZA-PBO LS UC pts, and in 33.3% and 15.7% OZA-OZA and OZA-PBO EXT UC pts. Treatment effects at W10 (OZA vs PBO, Cochran-Mantel-Haenszel [CMH] test, stratified by CS use at screening and prior anti-TNF) were generally similar in LS and EXT UC pts: Clinical Remission (CRem; odds ratio [OR] 4.1 [95% CI 1.9-9.0]; *P*=.0001 & 2.8 [1.02-7.6]; *P*=.0387), Clinical Response (CRes; 3.0 [1.9-4.7]; *P*=.0001 & 2.3 [1.3-4.2]; *P*=.0066), Endoscopic Improvement (EI; 2.9 [1.6-5.0]; *P*< .001 & 2.5 [1.1-5.7]; *P*=.024), and Mucosal Healing (MH; 5.4 [1.9-15.4]; *P*=.0006 & 2.1 [0.7-6.5]; *P*=.1675), respectively (**Fig**). Treatment effects at W52 (OZA-OZA vs OZA-PBO, CMH test, stratified by CRem status and CS use at W10) were generally similar for LS and EXT UC pts: CRem (OR 2.7 [95% CI 1.6-4.5]; *P*=.0003 & 2.8 [1.3-6.2]; *P*=.0084), CRes (2.4 [1.5-3.8]; *P*=.0003 & 2.0 [1.01-3.9]; *P*=.0468), EI (2.4 [1.5-3.9]; *P*< .001 & 2.8 [1.3-6.1]; *P*=.007), CS-free remission (2.3 [1.3-4.0]; *P*=.0040 & 3.4 [1.5-8.0]; *P*=.0035), and MH (2.4 [1.4-4.2]; *P*=.0022 & 4.0 [1.6-10.6]; *P*=.0033), respectively (Figure).

Conclusion: This post hoc analysis shows that OZA is effective at achieving all clinical endpoints assessed at W10 and W52 in pts with LS and EXT disease distribution at BL. OZA is efficacious in UC pts regardless of disease extent.



[0731] **Figure 1.** Efficacy of OZA by BL endoscopic disease distribution in TN

Table 1.

Number (%) of pts achieving clinical outcomes		IP: Cohort 1		IP: Cohort 2	MP	
		PBO	OZA 0.92 mg	OZA 0.92 mg	OZA-PBO	OZA-OZA
LS UC subgroup (n=639)	Clinical Remission	8/134 (6.0%)	55/268 (20.5%)	57/237 (24.1%)	29/157 (18.5%)	57/152 (37.5%)
	Clinical Response	36/134 (26.9%)	138/268 (51.5%)	130/237 (54.9%)	65/157 (41.4%)	95/152 (62.5%)
	Endoscopic Improvement	18/134 (13.4%)	83/268 (31.0%)	70/237 (29.5%)	45/157 (28.7%)	74/152 (48.7%)
	Mucosal Healing	4/134 (3.0%)	38/268 (14.2%)	29/237 (12.2%)	25/157 (15.9%)	47/152 (30.9%)
EXT UC subgroup (n=373)	Clinical Remission	5/82 (6.1%)	24/161 (14.9%)	20/130 (15.4%)	13/70 (18.6%)	28/78 (35.9%)
	Clinical Response	20/82 (24.4%)	67/161 (41.6%)	63/130 (48.5%)	28/70 (40.0%)	43/78 (55.1%)
	Endoscopic Improvement	8/82 (9.8%)	34/161 (21.1%)	30/130 (23.1%)	15/70 (21.4%)	31/78 (39.7%)
	Mucosal Healing	4/82 (4.9%)	16/161 (9.9%)	13/130 (10.0%)	7/70 (10.0%)	21/78 (26.9%)

S732

Ozanimod Is an Effective Oral Treatment for Patients With Ulcerative Colitis Regardless of Moderate orSevere Endoscopic Disease Activity at Baseline: A Post Hoc Analysis of the Phase 3 True North Study

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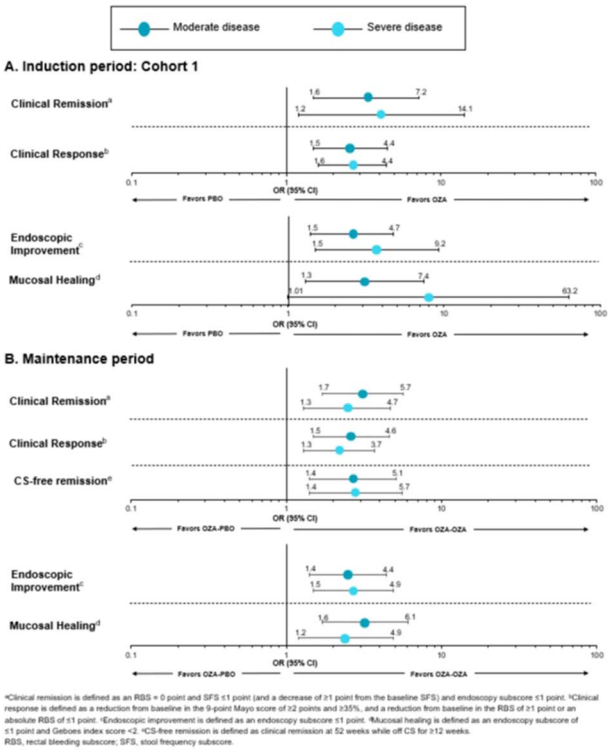
Introduction: Ozanimod (OZA), an oral S1P receptor modulator, is effective and well tolerated in the treatment of moderate to severely active ulcerative colitis (UC). OZA is approved in this patient (pt) population based on results of the phase 3, randomized, double-blind, placebo (PBO)-controlled True North (TN) study (NCT02435992). Disease activity may influence treatment outcomes. Consequently, this post hoc analysis of TN explored the effect of baseline endoscopic disease activity on OZA efficacy.
Methods: In TN, pts were randomized to oral OZA 0.92 mg once daily or PBO (Cohort 1) or to open-label OZA (Cohort 2) for a 10-week induction period (IP). OZA clinical responders were rerandomized at Week 10 to OZA or PBO for a 42-week maintenance period (MP). Efficacy was assessed at Weeks 10 and 52, subgrouped by endoscopic disease activity at baseline ("moderate," Mayo endoscopic score [MES] =2, or "severe" [MES=3]).
Results: Baseline demographics were similar in pts with moderate or severe disease. OZA was more effective than PBO regardless of baseline endoscopic severity at Weeks 10 and 52 for all evaluated endpoints (Table). Treatment effects at Week 10 (OZA vs PBO; Cochran-Mantel-Haenszel [CMH] test, stratified by corticosteroid [CS] use at screening and prior anti-tumor necrosis factor) were similar in pts with moderate or severe disease: Clinical Remission (CRem; odds ratio [OR] 3.4 [95% CI 1.6-7.2]; P=.0007; and 4.1 [95% CI 1.2-14.1]; P=.0198), Clinical Response (CRes; 2.6 [1.5-4.4]; P=.0006; and 2.7 [1.6-4.4]; P=.0001), Endoscopic Improvement (EI; 2.6 [1.5-4.7]; P< .001; and 3.7 [1.5-9.2]; P=.003), and Mucosal Healing (MH; 3.1 [1.3-7.4]; P=.0066; and 8.0 [1.01-63.2]; P=.0221), respectively (Figure). Tx effects at Week 52 (OZA-OZA vs OZA-PBO; CMH test, stratified by Week 10 CRem and CS use at Week 10) were similar in pts with moderate or severe disease: CRem (OR 3.1 [95% CI 1.7-5.7]; P=.0003; and 2.5 [95% CI 1.3-4.7]; P=.0038), CRes (2.6 [1.5-4.6]; P=.0007; and 2.2 [1.3-3.7]; P=.0043), EI (2.5 [1.4-4.4]; P=.002; and 2.7 [1.5-4.9]; P< .001), CS-free remission (2.7 [1.4-5.1]; P=.0027; and 2.8 [1.4-5.7]; P=.0032), and MH (3.2 [1.6-6.1]; P=.0005; and 2.4 [1.2-4.9]; P=.0182), respectively (Figure).
Conclusion: This post hoc analysis of the phase 3 TN study shows that OZA is effective at achieving clinical endpoints at Weeks 10 and 52 in pts with BL moderate or severe endoscopic disease activity. OZA is efficacious in UC pts regardless of BL endoscopic disease activity.



[a]Clinical remission is defined as an RBS = 0 point and SFS ≤1 point (and a decrease of ≥1 point from the baseline SFS) and endoscopy subscore ≤1 point. [b]Clinical response is defined as a reduction from baseline in the 9-point Mayo score of ≥2 points and ≥35%, and a reduction from baseline in the RBS of ≥1 point or an absolute RBS of ≤1 point. [c]Endoscopic improvement is defined as an endoscopy subscore ≤1 point. [d]Mucosal healing is defined as an endoscopy subscore of ≤1 point and Geboes index score <2. [e]CS-free remission is defined as clinical remission at 52 weeks while off CS for ≥12 weeks.
RBS, rectal bleeding subscore; SFS, stool frequency subscore.

[0732] **Figure 1.** Efficacy of OZA by BL endoscopic disease activity in TN

Table 1.

Patients achieving clinical outcomes, n (%)		IP: Cohort 1		IP: Cohort 2	MP	
		PBO	OZA 0.92 mg	OZA 0.92 mg	OZA-PBO	OZA-OZA
Moderate subgroup (n=403)	Clinical Remission	10/86 (11.6%)	58/179 (32.4%)	50/138 (36.2%)	23/111 (20.7%)	43/98 (43.9%)
	Clinical Response	28/86 (32.6%)	101/179 (56.4%)	90/138 (65.2%)	50/111 (45.0%)	67/98 (68.4%)
	Endoscopic Improvement	20/86 (23.3%)	81/179 (45.3%)	64/138 (46.4%)	34/111 (30.6%)	52/98 (53.1%)
	Mucosal Healing	7/86 (8.1%)	40/179 (22.3%)	31/138 (22.5%)	19/111 (17.1%)	38/98 (38.8%)
Severe subgroup (n=609)	Clinical Remission	3/130 (2.3%)	21/250 (8.4%)	27/229 (11.8%)	19/116 (16.4%)	42/132 (31.8%)
	Clinical Response	28/130 (21.5%)	104/250 (41.6%)	103/229 (45.0%)	43/116 (37.1%)	71/132 (53.8%)
	Endoscopic Improvement	6/130 (4.6%)	36/250 (14.4%)	36/229 (15.7%)	26/116 (22.4%)	53/132 (40.2%)
	Mucosal Healing	1/130 (0.8%)	14/250 (5.6%)	11/229 (4.8%)	13/116 (11.2%)	30/132 (22.7%)

S733

Impact of Inflammatory Burden on Efficacy of Upadacitinib Maintenance Therapy in Ulcerative Colitis: Results From the Phase 3 U-ACHIEVE Study

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Introduction: Upadacitinib (UPA) has demonstrated superior efficacy to placebo (PBO) and a favorable safety profile in patients with moderately to severely active ulcerative colitis (UC) in trial U-ACHIEVE Maintenance, in which two maintenance doses of UPA (30mg and 15mg once daily [QD]) were evaluated.[1–3] However, data are limited on the impact of inflammatory burden on the efficacy of the two maintenance doses.

Methods: The primary efficacy analysis of U-ACHIEVE Maintenance included the first 451 patients who achieved a clinical response (per Adapted Mayo score) after 8 weeks of UPA 45mg QD treatment in the induction trials. The primary endpoint was clinical remission per Adapted Mayo score at Week 52 and a key secondary endpoint was endoscopic improvement at Week 52. This post hoc analysis evaluated the efficacy, based on these endpoints, of UPA 30mg vs UPA 15mg maintenance therapy in patients in U-ACHIEVE Maintenance stratified by three measures of inflammatory burden: baseline Full Mayo score >9 vs ≤9, presence of pancolitis (yes vs no), and presence of ≥1 extraintestinal manifestation (yes vs no).

Results: Overall, 451 patients (PBO: n=149, UPA 15mg: n=148, and UPA 30mg: n=154) were included in the intent-to-treat maintenance population. Both UPA 30mg and UPA 15mg demonstrated favorable efficacy compared with PBO, regardless of the inflammatory burden (Table). However, the differences in proportions of responders who achieved clinical remission at Week 52 and who received UPA 30mg vs UPA 15mg were greater in patients with a high inflammatory burden (difference range: 12.0–22.0%) than those patients without a high inflammatory burden (difference range: 1.4–6.2%; Table). Similar results were seen for proportions of patients who achieved endoscopic improvement at Week 52 (high inflammatory burden [difference range: 12.0–26.1%] relative to those without high inflammatory burden [difference range: 0.2–14.1%]).

Conclusion: Both UPA maintenance doses were efficacious compared with PBO, regardless of inflammatory burden, in the achievement of clinical remission and endoscopic improvement. Although results should be interpreted with respect to the small sample size in some subgroups and the post hoc nature of the analysis, these data suggest that patients with a high inflammatory burden of UC may have a relatively greater benefit from UPA 30mg than UPA 15mg, compared with those without high inflammatory burden.

Table 1.

	PBO, n/N (%) (N=149)	UPA 15 mg QD, n/N (%) (N=148)	UPA 30 mg QD, n/N (%) (N=154)	Difference between UPA 30 mg vs UPA 15 mg[a], %
Primary endpoint: Clinical remission[b] at Week 52 per Adapted Mayo Score				
BL Full Mayo score ≤9	7/74 (9.5)	40/75 (53.1)	40/73 (54.5)	1.4
BL Full Mayo score >9	11/75 (14.8)	23/73 (31.2)	40/79 (50.4)	19.2
Pancolitis at BL, no	13/79 (16.5)	31/66 (46.6)	36/68 (52.8)	6.2
Pancolitis at BL, yes	5/70 (7.1)	32/82 (38.8)	44/86 (50.8)	12.0
EIM at BL, no	13/112 (11.6)	50/112 (44.3)	56/113 (49.4)	5.1
EIM at BL, yes	5/37 (13.7)	13/36 (36.1)	24/41 (58.1)	22.0
Key secondary endpoint: Endoscopic improvement[c] at Week 52				
BL Full Mayo score ≤9	8/74 (10.8)	45/75 (60.4)	44/73 (60.6)	0.2
BL Full Mayo score >9	14/75 (18.1)	27/73 (36.7)	50/79 (62.8)	26.1
Pancolitis at BL, no	16/79 (20.3)	33/66 (49.6)	43/68 (63.7)	14.1
Pancolitis at BL, yes	6/70 (8.0)	39/82 (47.9)	52/86 (59.9)	12.0
EIM at BL, no	15/112 (13.7)	57/112 (50.9)	68/113 (60.2)	9.3
EIM at BL, yes	6/37 (16.9)	15/36 (41.7)	27/41 (65.4)	23.7

Data are from the ITT population, defined as the first 450 randomized and treated patients with 8-week UPA 45 mg QD induction treatment who were enrolled in Cohort 1 under the protocol for the 52-week maintenance treatment period. The actual number of patients in the analysis was 451 due to the same enrollment date of the 450th and 451st patients. Non-responder imputation incorporating multiple imputations was performed to handle missing data due to COVID-19 incidence.
[a]Not part of the predefined statistical analyses.
[b]Adapted Mayo score ≤2, with stool frequency subscore ≤1 (and not greater than induction baseline), rectal bleeding subscore of 0, and endoscopic subscore ≤1.
[c]Endoscopic subscore ≤1.
BL, baseline; EIM, extraintestinal manifestation; ITT, intent-to-treat; PBO, placebo; QD, once daily; UPA, upadacitinib.

S734

Etrasimod 2mg Once Daily as Treatment for Patients With Moderately to Severely Active Ulcerative Colitis: Topline and Subgroup Analysis From ELEVATE UC 52 and ELEVATE UC 12

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Introduction: Etrasimod (ETR), is an investigational, once-daily, oral, selective sphingosine 1-phosphate receptor 1,4,5 modulator in development for the treatment of moderately to severely active ulcerative colitis (UC). We report a subgroup analysis according to prior exposure to advanced (biologic/Janus kinase inhibitor [JAKi]) therapy from the phase 3 trials ELEVATE UC 52 and ELEVATE UC 12 that evaluated efficacy and safety of ETR vs placebo (PBO) in adults with UC.
Methods: In ELEVATE UC 52 (NCT03945188) and ELEVATE UC 12 (NCT03996369), adults (16-80 years) with moderately to severely active UC (based on modified Mayo Score of 4-9 with endoscopic subscore ≥2 and rectal bleeding subscore ≥1) and history of inadequate response, loss of response, or intolerance to ≥1 UC treatment were randomized 2:1 to once-daily ETR 2mg or PBO. ELEVATE UC 52 utilized a treat-through design comprising a 12-week induction period followed by a 40-week maintenance period. ELEVATE UC 12 comprised a 12-week induction period. Patients (pts) were stratified by prior exposure to biologic/JAKi therapy, baseline corticosteroid use, and baseline disease activity. Subgroup analyses were performed on primary and key secondary endpoints at Wk 12 and Wk 52 in ELEVATE UC 52, and Wk 12 in ELEVATE UC 12 in pts naïve to, or with prior exposure to, 1 or >1 biologic/JAKi.
Results: In ELEVATE UC 52, ETR-treated pts achieved statistically significant improvements vs PBO in the co-primary and all key secondary efficacy endpoints at Wks 12 and 52. Significant improvements vs PBO in all endpoints were observed in the biologic/JAKi-naïve and 1 prior biologic/JAKi subgroups (Table). In pts with >1 prior biologic/JAKi, efficacy was demonstrated across all endpoints, generally with lower rates vs PBO. In ELEVATE UC 12, ETR-treated pts achieved statistically significant improvements vs PBO in the co-primary and all key secondary efficacy endpoints at Wk 12. Significant improvements vs PBO in all endpoints were observed in biologic/JAKi-naïve subgroup, and in clinical remission in 1 prior biologic/JAKi subgroup. Efficacy was less evident in the >1 biologic/JAKi experienced subgroup.
Conclusion: In ELEVATE UC 52 and ELEVATE UC 12, ETR was shown to be efficacious vs PBO in moderate to severe UC. While limited by small sample sizes, these subgroup analyses demonstrate consistent benefit of ETR vs PBO in biologic/JAKi-naïve and 1 prior biologic/JAKi subgroups with less evident benefit in the >1 biologic/JAKi subgroup

Table 1. **Subgroup Analysis of the Proportion of Patients Achieving the Primary and Key Secondary Efficacy Endpoints in the ELEVATE UC 52 and ELEVATE UC 12 Trials in the Overall Population and Stratified by Prior Biologic/JAKi Exposure[a]**

	ELEVATE UC 52 (treat-through) Week 12			ELEVATE UC 52 (treat-through) Week 52			ELEVATE UC 12 (induction only) Week 12		
Endpoint, n (%) by no. of prior bio/ JAKis	PBO (n=144)	ETR 2 mg (n=289)	% diff. from PBO (95% CI) [*P* value]	PBO (n=144)	ETR 2 mg (n=289)	% diff. from PBO (95% CI) [*P* value]	PBO (n=116)	ETR 2 mg (n=238)	% diff. from PBO (95% CI) [*P* value]
Clinical remission[b]									
Overall	10/135 (7.4)	74/274 (27.0)	19.8 (12.9 - 26.6) [< .001]	9/135 (6.7)	88/274 (25.4)	25.4 (18.4 - 32.4) [< .001]	17/112 (15.2)	55/222 (24.8)	9.7 (1.1 - 18.2) [.026]
Naïve	9/99 (9.1)	66/205 (32.2)	23.3 (14.7 - 31.8) [< .001]	8/99 (8.1)	75/205 (36.6)	29.0 (20.5 - 37.5) [< .001]	12/77 (15.6)	46/159 (28.9)	13.8 (3.3 - 24.4) [.010]
1 bio/JAKi	1/25 (4.0)	8/44 (18.2)	15.9 (1.6 - 30.2) [.029]	2/25 (8.0)	13/44 (29.5)	19.7 (3.2 - 36.2) [.020]	2/20 (10.0)	12/36 (33.3)	21.9 (2.4 - 41.3) [.028]
>1 bio/JAKi	2/20 (10.0)	7/40 (17.5)	4.4 (−12.7 - 21.5) [.613]	1/20 (5.0)	6/40 (15.0)	9.8 (−6.0 - 25.6) [.224]	3/19 (15.8)	4/43 (9.3)	−7.5 (−26.2 - 11.2) [.433]
Endoscopic improvement[c]									
Overall	19/135 (14.1)	96/274 (35.0)	21.1 (13.0 - 29.3) [< .001]	14/135 (10.4)	102/274 (37.2)	26.7 (19.0 - 34.4) [< .001]	21/112 (18.8)	68/222 (30.6)	12.1 (3.0 - 21.2) [.009]

Table 1. (*continued*)

Endpoint, n (%) by no. of prior bio/ JAKis	ELEVATE UC 52 (treat-through) Week 12			ELEVATE UC 52 (treat-through) Week 52			ELEVATE UC 12 (induction only) Week 12		
	PBO (n=144)	ETR 2 mg (n=289)	% diff. from PBO (95% CI) [*P* value]	PBO (n=144)	ETR 2 mg (n=289)	% diff. from PBO (95% CI) [*P* value]	PBO (n=116)	ETR 2 mg (n=238)	% diff. from PBO (95% CI) [*P* value]
Naïve	20/99 (20.2)	86/205 (42.0)	22.1 (12.1 - 32.2) [< .001]	16/99 (16.2)	86/205 (42.0)	26.8 (17.3 - 36.4) [< .001]	14/77 (18.2)	58/159 (36.5)	18.9 (7.9 - 29.8) [.001]
1 bio/JAKi	1/25 (4.0)	12/44 (27.3)	24.2 (9.3 - 39.0) [.001]	2/25 (8.0)	15/44 (34.1)	24.8 (7.9 - 41.8) [.004]	4/20 (20.0)	13/36 (36.1)	13.3 (−10.2 - 36.8) [.267]
>1 bio/JAKi	3/20 (15.0)	10/40 (25.0)	7.7 (−12.6 - 28.0) [.456]	1/20 (5.0)	12/40 (30.0)	24.0 (5.7 - 42.3) [.010]	4/19 (21.1)	7/43 (16.3)	−4.1 (−25.6 - 17.3) [.706]
Mucosal healing[d]									
Overall	6/135 (4.4)	58/274 (21.2)	16.9 (10.8 - 23.0) [< .001]	11/135 (8.1)	73/274 (26.6)	18.4 (11.4 - 25.4) [< .001]	10/112 (8.9)	36/222 (16.2)	7.4 (0.5 - 14.4) [.036]
Naïve	9/99 (9.1)	54/205 (26.3)	17.0 (8.6 - 25.5) [< .001]	13/99 (13.1)	60/205 (29.3)	16.9 (8.0 - 25.8) [< .001]	8/77 (10.4)	31/159 (19.5)	9.5 (0.5 - 18.5) [.039]
1 bio/JAKi	0/25 (0.0)	6/44 (13.6)	13.8 (3.1 - 24.5) [.012]	2/25 (8.0)	11/44 (25.0)	16.1 (0.1 - 32.0) [.048]	1/20 (5.0)	6/36 (16.7)	10.8 (−5.3 - 26.8) [.189]
>1 bio/JAKi	0/20 (0.0)	6/40 (15.0)	14.2 (3.0 - 25.5) [.013]	0/20 (0.0)	8/40 (20.0)	21.5 (8.4 - 34.6) [.001]	1/19 (5.3)	4/43 (9.3)	5.1 (−8.3 - 18.5) [.458]

bio, biologic; CI, confidence interval; ES, endoscopic subscore; ETR, etrasimod; JAKi, Janus kinase inhibitor; MMS, modified Mayo score; PBO, placebo; RB, rectal bleeding; SF, stool frequency.
[a]Data based on Cochran–Mantel–Haenszel analysis of Full Analysis Set (all randomized patients who received ≥1 dose of study drug) and non-responder imputation method with baseline MMS 5-9 as the primary analysis and baseline MMS 4-9 as supplemental analysis. *P* values are 2-sided.
[b]SF subscore = 0 (or = 1 with ≥1-point decrease from baseline), RB subscore = 0, and ES ≤1.
[c]ES ≤1.
[d]ES ≤1 with histologic remission measured by Geboes index score < 2.0.

S735

Mirikizumab Improves Quality of Life in Moderately-to-Severely Active UC: Improvement in IBDQ Scores in Participants of LUCENT-1 and LUCENT-2 Randomized, Double-Blind, Placebo-Controlled Phase 3 Trials

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Introduction: The Inflammatory Bowel Disease Questionnaire (IBDQ) is a measure of health-related quality of life (QoL). This analysis evaluated effect of mirikizumab (miri) vs placebo (PBO) on IBDQ scores in patients (pts) with moderately-to-severely active ulcerative colitis (UC) who had failed prior conventional or biologic therapy in a Phase 3, double-blind, 12-week (W) induction study (LUCENT-1) followed by a 40W maintenance study (LUCENT-2) for a total of 52W continuous therapy.
Methods: Pts (N=1162) in LUCENT-1 were randomized 3:1 to receive 300mg miri or PBO intravenously once every four weeks (Q4W). 544 pts who achieved Modified Mayo Score Clinical Response to miri by W12 of induction were rerandomized 2:1 in LUCENT-2 to subcutaneous miri 200mg or PBO Q4W in maintenance period. Randomization was stratified by previous biologic therapy failure, baseline corticosteroid use, and region. LUCENT-1 stratification included baseline (BL) disease activity, and LUCENT-2 included LUCENT-1 clinical remission status. The least squares mean change from BL in IBDQ scores at W12 of induction and W40 of maintenance was determined using analysis of covariance models. BL was W0 of therapy and stratification factors and BL scores were used as covariates. The Minimal Clinically Important Difference (MCID) was defined as an improvement of ≥16 points in total IBDQ score (IBDQ response) and IBDQ remission as a total score ≥170 points. IBDQ response and remission were calculated using non-responder imputations. Treatments were compared using the common risk difference (risk diff).
Results: Miri treatment resulted in significantly greater improvement from BL in IBDQ total and domain scores vs PBO at both W12 of induction and W40 of maintenance (52W treatment) (Table). The proportions of pts who achieved an IBDQ response was significantly greater for miri treated pts vs PBO at W12 (risk diff =17.1[95%CI:10.7, 23.5]) and W40 (29.5 [21.0, 37.9]). Significantly greater proportions of pts receiving miri achieved IBDQ remission at W12 (18.1 [11.8, 24.4]) and W40 (28.5 [20.1, 37.0]) vs PBO (all evaluations and timepoints: p< 0.001).
Conclusion: Pts reported significantly greater improvements in IBDQ scores at induction and maintenance with miri compared to PBO. Over 75% of pts achieved a clinically meaningful improvement in QoL, as measured by IBDQ response, at the end of the 52 weeks of miri treatment.

Table 1. **LUCENT-1 and LUCENT-2 Trials Change from Baseline in the Inflammatory Bowel Disease Questionnaire**

	IBDQ Total Score[1]		IBDQ Response[2] Score Improvement ≥16		IBDQ Remission[2] IBDQ Total Score ≥170	
	LSM Change from BL (SE)	LSM Diff (SE)	n (%)	Risk Diff (95% CI)	n (%)	Risk Diff (95% CI)
LUCENT-1 Week 12 of Induction						
PBO IV Q4W (N=294)	25.21 (1.80)		164 (55.8)		117 (39.8)	
Miri 300 mg IV Q4W (N=868)	38.42 (1.11)	13.21 (2.01)*	631 (72.7)	17.1 (10.7, 23.5)*	499 (57.5)	18.1 (11.8, 24.4)*
LUCENT-2 Week 40 of Maintenance (52 Weeks of Continuous Therapy) of Miri Induction Responders						
PBO SC (N=179)	24.51 (2.77)		88 (49.2)		77 (43.0)	
Miri 200 mg SC (N=365)	49.75 (2.10)	25.24 (3.09)*	289 (79.2)	29.5 (21.0, 37.9)*	264 (72.3)	28.5 (20.1, 37.0)*

Abbreviations: BL=baseline; CI=confidence interval; Diff=difference; IBDQ=Inflammatory Bowel Disease Questionnaire; IV=intravenous; LSM=least squares mean; Miri=mirikizumab; n=number of patients in the specified category; N=number of patients in the analysis population; PBO=placebo; Q4W=every 4 weeks; Risk Diff=common risk difference; SC=subcutaneous; SE=standard error.
1Inflammatory Bowel Disease Questionnaire domains and total scores were evaluated by analysis of covariance with modified baseline observation carried forward and adjustment for covariates.
2Inflammatory Bowel Disease Questionnaire-based measurements for clinical response and remission were analyzed using non-responder imputation. The common risk difference was the stratification-adjusted difference in the proportion of participants receiving mirikizumab minus the proportion of participants receiving placebo.
*p< 0.001.

S736

Efficacy and Safety of Upadacitinib Induction Therapy in Patients With Moderately to Severely Active Crohn's Disease: Results From a Randomized Phase 3 U-EXCEL Study

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Introduction: Eligible patients(N=526) with moderate to severe active Crohn's Disease(CD), defined as average daily stool frequency(SF)≥4 and/or abdominal pain score(APS)≥2, and a Simple Endoscopic Score for CD(SES-CD) (excluding the narrowing component subscore) ≥6(≥4 for subjects with isolated ileal disease).
Methods: Patients(pts) were randomized 2:1 to UPA45 or PBO for 12 weeks(wks). Pts on baseline corticosteroids(CS) initiated a protocolized tapering at wk4. The co-primary endpoints, clinical remission(per CDAI for US [CDAI< 150] or per SF/APS for EU [average daily SF ≤2.8 and APS≤1.0 and neither greater than baseline [BL]) and endoscopic response(decrease in SES-CD >50% from BL or ≥2-point reduction from BL for pts with a BL SES-CD=4), were evaluated at wk 12. Safety, primary and key secondary clinical, and endoscopic outcomes were evaluated through wk 12.
Results: BL demographics and characteristics were similar between groups; 45.4% of pts had a history of prior biologic use or failure. At wk 12, significantly more pts receiving UPA45 vs PBO achieved the co-primary endpoints: clinical remission(per CDAI, UPA45 49.5% vs PBO 29.1%; per SF/APS, UPA45 50.7% vs PBO 22.2%) and endoscopic response (UPA45 45.5% vs PBO 13.1%) ($P< .0001$ for all endpoints; **Table**). UPA45 was superior to PBO for most of the ranked secondary endpoints including clinical remission per CDAI and SF/APS at wk 4, CS-free clinical remission per CDAI and SF/APS at wk 12, clinical response(CR-100; 100-point decrease in CDAI from BL at wk 2 and wk 12, and endoscopic remission at wk 12($P< .0001$ or $P< .01$, Table). Severe AEs occurred at 8.9% and 8.5% within UPA45 and PBO groups, respectively. The most common AEs(≥5% of pts) were acne and anemia among pts treated with UPA, and CD exacerbation among pts receiving PBO. Serious infections were 1.1% and 1.7% for UPA45 and PBO groups, respectively. Herpes zoster(2.9%) was reported in the UPA45 group only, and an adjudicated cardiovascular event(0.6%) was reported only in the PBO group. No treatment-emergent deaths, malignancies, other opportunistic infections, adjudicated gastrointestinal perforations or adjudicated thrombotic events were reported in either group.
Conclusion: UPA45 induction therapy was superior to PBO in achieving early response, including clinical remission, endoscopic response, and CS-free clinical remission during the U-EXCEL study. UPA45 was well tolerated, with no new safety risks and a safety profile comparable to previous UPA studies.

Table 1. Co-primary and Key Secondary Endpoints

Endpoint	PBO (N=176) % [95% CI][g]	UPA 45 mg QD (N=350) % [95% CI][g]	Difference vs. PBO % [95% CI][h]
Co-Primary Endpoints			
Clinical remission, wk 12 Per CDAI[a] Per SF/APS[b]	29.1 [22.4, 35.8] 22.2 [16.0, 28.3]	49.5 [44.2, 54.8] 50.7 [45.5, 56.0]	20.8 [12.7, 28.8]** 28.7 [20.9, 36.4]**
Endoscopic response[c], wk 12	13.1 [8.1, 18.0]	45.5 [40.3, 50.8]	33.0 [26.2, 39.9]**
Key Secondary Endpoints			
Clinical Remission, wk 4 Per CDAI[a] Per SF/APS[b]	26.7 [20.2, 33.3] 14.8 [9.5, 20.0]	37.1 [32.1, 42.2] 35.7 [30.7, 40.7]	10.8 [2.9, 18.6]* 21.2 [14.3, 28.2]**
Corticosteroid-free clinical remission, wk 12 per CDAI[d] per SF/APS[d]	(N=64) 15.7 [6.8, 24.7] 12.5 [4.4, 20.6]	(N=126) 42.9 [34.2, 51.5] 44.4 [35.8, 53.1]	27.7 [15.7, 39.8]** 32.6 [21.5, 43.7]**
Clinical Response CR-100[e] Week 2 Week 12	20.4 [14.4, 26.5] 37.3 [30.1, 44.5]	32.2 [27.3, 37.1] 56.6 [51.4, 61.8]	11.7 [4.2, 19.2]* 19.8 [11.3, 28.4]**
Endoscopic remission[f], wk 12	7.4 [3.5, 11.3]	28.9 [24.2, 33.7]	21.8 [15.8, 27.8]**

Patient randomization was stratified by baseline corticosteroid use, endoscopic disease severity, and the number of previously failed biologics. All patients within this dataset were included here within the ITT population.
[a]Clinical remission per CDAI = per US, CDAI < 150.
[b]Clinical remission per SF/APS = per EU, average daily SF ≤ 2.8 and average daily APS ≤ 1.0 and both not greater than baseline
[c]Endoscopic response = decrease in SES-CD > 50% from baseline (or for subjects with a baseline SES-CD of 4, at least a 2-point reduction from baseline), as scored by a central reviewer.
[d]Corticosteroid-free clinical remission = discontinuation of corticosteroid use and achievement of clinical remission per CDAI or SF/APS at wk 12 among patients on corticosteroids at baseline.
[e]Clinical response-100 = decrease of ≥ 100 points in CDAI from baseline.
[f]Endoscopic remission = SES-CD ≤ 4, at least a 2-point reduction versus baseline and no subscore >1 in any individual variable, as scored by a central reviewer.
[g]Results are based on non-responder imputation incorporating multiple imputation to handle missing data due to COVID-19 (NRI-C).
[h]95% CI for adjusted difference and p-value are calculated according to the Cochran-Mantel-Haenszel (CMH) test adjusted for randomization strata.
$**P \leq .0001$ or $*P \leq .01$ vs PBO; Average daily abdominal pain score, APS; Coronavirus disease 2019, COVID-19; Confidence Interval, CI; Crohn's Disease Activity Index, CDAI; Simple Endoscopic Score for CD, SES-CD, Placebo, PBO; Once daily, QD; average daily very soft/liquid stool frequency, SF; Upadacitinib, UPA.

S737

Mirikizumab Demonstrates Sustained Improvement in Fatigue in Patients with Moderately-to-Severely Active Ulcerative Colitis: Results From the Phase 3 LUCENT-1 Induction and LUCENT-2 Maintenance Studies

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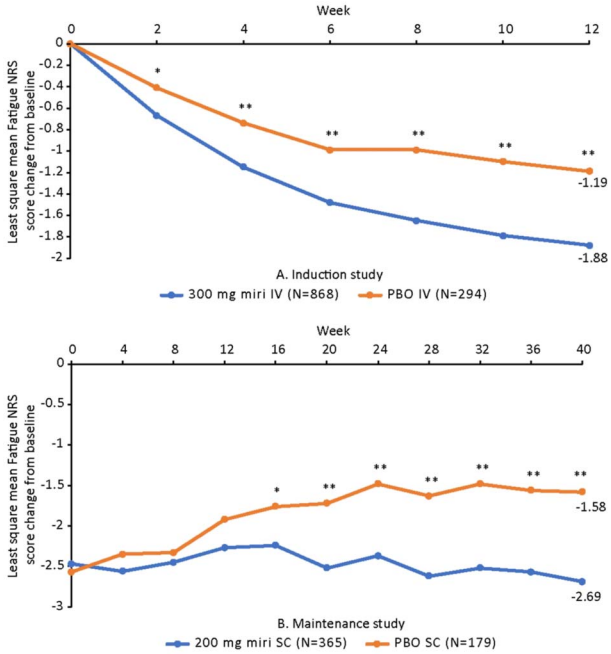
Introduction: Fatigue is a significant concern for patients (pts) with ulcerative colitis (UC). Mirikizumab (miri), an anti-IL-23p19 monoclonal antibody, demonstrated efficacy vs placebo (PBO) in adult pts with moderately-to-severely active UC in phase 3, randomized, double-blind, PBO-controlled 12-week (W) induction (LUCENT-1/NCT03518086) and 40-W maintenance (LUCENT-2/NCT03524092) studies. Here, we report the effect of miri vs PBO on fatigue.
Methods: In the induction study, pts (N=1162) were randomized (3:1) to intravenous (IV) miri 300 mg or PBO every 4 weeks (Q4W). Pts who achieved clinical response with miri at W12 (N=544) in the induction were re-randomized (2:1) to subcutaneous (SC) miri 200 mg or PBO Q4W through W40 in the maintenance study. Fatigue was measured using the Fatigue Numeric Rating Scale (NRS), a single-question patient-reported instrument that measures the "worst fatigue in the past 24 hours" with an 11-point NRS (0 = no fatigue, 10 = fatigue as bad as you can imagine), on an electronic daily diary in LUCENT-1 and W40 of LUCENT-2 studies. The treatment difference in least squares mean (LSM) change from the baseline (W0 of therapy) in Fatigue NRS scores was determined using the analysis of covariance model.
Results: In the induction study, a significant reduction in Fatigue NRS score vs PBO was observed as early as W2 (LSM difference [95% CI]: −0.25 [−0.45, −0.05], p=0.013). The LSM difference from baseline at W12 was −0.69 (−0.98, −0.40; p< 0.001). In the maintenance study, a significant reduction in Fatigue NRS score compared to PBO was observed from W16 and sustained through W40 (−1.10 [−1.53, −0.67]; p< 0.001; Figure).
Conclusion: Miri-treated pts with moderately-to-severely active UC showed early (W2) and sustained (W40) improvements in fatigue compared to PBO.



[0737] **Figure 1.** Change from Baseline in Fatigue NRS during A. Induction and B. Maintenance. *p<0.05; **p<0.001 vs placebo Fatigue NRS score was collected as a single measurement at each visit from W4 to W36 in LUCENT-2. Weekly measures were calculated by averaging data from all available daily diary entries of Fatigue NRS scores for a 7-day period. The baseline value for both induction and maintenance was calculated from daily diary entries the week prior to W0 of induction. Abbreviations: NRS, Numeric Rating Scale; miri, mirikizumab; PBO, placebo; IV, intravenous; SC, subcutaneous

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S738

Real World Evidence Comparing Vedolizumab and Ustekinumab in Anti-TNF Experienced Patients With Crohn's Disease

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Introduction: Many patients with Crohn's disease (CD) lose response or become intolerant to anti-TNF therapy. Newer classes of biologics have demonstrated efficacy in anti-TNF experienced patients, but real-world comparative effectiveness studies are limited and have yielded conflicting results. We sought to compare the effectiveness and safety of ustekinumab to vedolizumab in a large, geographically diverse United States (U.S.) population of adult patients with CD previously treated with TNF inhibitors.

Methods: We conducted a retrospective cohort study using longitudinal claims data from a large national U.S. insurance company (Anthem, Inc.). We identified CD patients initiating vedolizumab or ustekinumab with evidence of anti-TNF treatment in the prior 6 months. Our primary outcome was treatment persistence > 52 weeks. Select secondary outcomes included: 1) all-cause hospitalization; 2) hospitalization for CD with surgery; 3) hospitalization for CD without surgery, and 4) hospitalization for infection. Propensity score fine stratification was used to control for confounding by demographic and clinical characteristics and prior treatments at baseline.

Results: We identified 885 new users of ustekinumab and 490 new users of vedolizumab who met criteria for our primary analysis. We observed no difference in treatment persistence [adjusted RR 1.09 (95% CI 0.95 -1.25)]; however, ustekinumab was associated with lower all-cause hospitalization (adjusted HR 0.73 [0.59-0.91]) and non-surgical CD hospitalizations (adjusted HR 0.58 [0.40-0.83]) (Figure). Ustekinumab initiators were also less likely to be hospitalized for infection (adjusted HR 0.56 [0.34-0.92]).

Conclusion: This real-world comparative effectiveness study of anti-TNF experienced CD patients initiating vedolizumab or ustekinumab showed similar treatment persistence rates beyond 52 weeks, although secondary outcomes such as all-cause hospitalization, non-surgical CD hospitalizations, and hospitalizations for infection favored ustekinumab initiation. We therefore advocate for individualized decision making in this medically refractory population, considering patient preference, prior Anti-TNF experience and other factors such as cost and route of administration.

Table 1: Incidence and Effect Estimates for Primary and Secondary Endpoints in New Users of Ustekinumab vs Vedolizumab

	Crude new users	Incidence rate*	Effect estimate** (95% CI) before weighting	Effect estimate** (95% CI) after weighting
Primary Outcome-Treatment persistence > 52 weeks				
Ustekinumab	884	45.7	1.08 (0.91-1.28)	1.09 (0.95-1.25)
Vedolizumab	484	42.3	(Ref)	(Ref)
Secondary measures of effectiveness				
All-cause hospitalization				
Ustekinumab	1217	267.80	0.73 (0.60, 0.90)	0.73 (0.59, 0.91)
Vedolizumab	667	366.70	(Ref)	(Ref)
Hospitalization for Crohn's disease without surgery				
Ustekinumab	1217	76.25	0.56 (0.40, 0.79)	0.58 (0.40, 0.83)
Vedolizumab	667	136.19	(Ref)	(Ref)
Hospitalization for Crohn's disease with surgery				
Ustekinumab	1217	87.96	0.90 (0.62, 1.29)	0.83 (0.57, 1.22)
Vedolizumab	667	97.78	(Ref)	(Ref)
Safety Outcome				
Hospitalization for any infection				
Ustekinumab	1217	40.72	0.53 (0.34, 0.85)	0.56 (0.34, 0.92)
Vedolizumab	667	76.23	(Ref)	(Ref)

* Incidence rates are per 100 new users for the primary outcome and per 1000 person-years for other outcomes

** Effect estimates are risk ratios for the primary outcome and hazard ratios for other outcomes

[0738] **Figure 1.** Incidence and Effect Estimates for Primary and Secondary Endpoints in New Users of Ustekinumab vs Vedolizumab

S739

Matching-Adjusted Indirect Comparison of Upadacitinib versus Vedolizumab as Induction Therapy in Patients With Moderately to Severely Active Ulcerative Colitis

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Introduction: Aim is to conduct placebo(PBO)-anchored matching-adjusted indirect comparison (MAIC) of efficacy and safety outcomes between upadacitinib(UPA) and vedolizumab(VEDO) in patients(pts) with moderate to severe active UC.
Methods: Data from phase 3 induction studies U-ACHIEVE Induction, U-ACCOMPLISH, and GEMINI 1 were used. Pts received UPA 45mg oral, once daily for 8 weeks; VEDO 300mg intravenous, at weeks 0 and 2; or corresponding PBO. Baseline characteristics for age, gender, duration of disease, total Mayo score, corticosteroid use, and fecal calprotectin levels from UPA trials were weighted to match that reported for pts in GEMINI for efficacy and previous anti-tumor necrosis factor/biologic therapy use/failure, Inflammatory Bowel Disease Questionnaire score, hemoglobin concentration, and white-cell count for safety. MAIC was done for bio-naïve(no exposure to any biologic at baseline) and bio-failure(inadequate response, loss of response, or intolerance to biologic treatment at baseline) pts for efficacy outcomes and all pts for safety outcomes. Efficacy outcomes evaluated at Week 6(VEDO)/Week 8(UPA) were clinical remission per full Mayo score(FMS; FMS≤2 with no subscore >1), clinical response per FMS(decrease from baseline in FMS≥3 points and ≥30%, accompanied by decrease in rectal bleeding score [RBS] of ≥1 or absolute RBS of 0 or 1), and endoscopic improvement(endoscopic subscore 0 or 1). Safety outcomes were all adverse events(AEs), serious AEs(SAEs), and serious infections.
Results: MAIC used data from 833 UPA pts and 351 VEDO pts for efficacy; 848 and 374 pts for safety. A significantly greater proportion of pts receiving UPA vs VEDO in bio-naïve and bio-failure groups achieved clinical remission, clinical response, and endoscopic improvement after weighting($P < 0.05$, Table). Rate differences between UPA and VEDO cohorts for clinical remission, clinical response, and endoscopic improvement were 0.160, 0.173, and 0.270, respectively, for bio-naïve group and 0.141, 0.374, and 0.191 for bio-failed cohort. Safety outcomes, including rates of AEs, SAEs, and serious infections, were not significantly different between UPA and VEDO.
Conclusion: Greater clinical efficacy with comparable safety was achieved during induction treatment with UPA vs VEDO for pts with moderate to severe active UC based on MAIC, given caveat of differences in onset of action rates and assessment times of the drugs. Additional MAIC to assess longer-term outcomes are warranted.

Table 1.

Efficacy/ safety outcome	Treatment	Rate[a,b,c] (Bio-naïve[d])	Rate difference (95% CI) UPA or VEDO vs PBO (Bio-naïve[d])	Rate difference (95% CI) UPA vs VEDO (Bio-naïve[d])	Rate[a, b,c] (Bio-failed)	Rate difference (95% CI) UPA or VEDO vs PBO (Bio-failed)	Rate difference (95% CI) UPA vs VEDO (Bio-failed)
Clinical remission	UPA 45 mg /PBO VEDO 300 mg /PBO	37.9%/5.4% 23.1%/6.6%	0.325 (0.245, 0.405) 0.165 (0.074, 0.256)	**0.160** (0.038, 0.282)**	20.7%/0.0% 9.8%/3.2%	0.207 (0.156, 0.257) 0.066 (−0.012, 0.143)	**0.141** (0.048, 0.233)**
Clinical response	UPA 45 mg /PBO VEDO 300 mg /PBO	81.4%/37.3% 53.1%/26.3%	0.441 (0.332, 0.549) 0.268 (0.137, 0.399)	**0.173* (0.003, 0.343)**	65.4%/9.6% 39.0%/20.6%	0.558 (0.479, 0.637) 0.184 (0.038, 0.329)	**0.374*** (0.208, 0.540)**
Endoscopic improve-ment	UPA 45 mg /PBO VEDO 300 mg /PBO	61.5%/10.3% 49.2%/25.0%	0.512 (0.422, 0.601) 0.242 (0.112, 0.372)	**0.270*** (0.112, 0.427)**	33.0%/4.0% 30.5%/20.6%	0.290 (0.221, 0.358) 0.099 (−0.043, 0.240)	**0.191* (0.034, 0.348)**

Table 1. (*continued*)

Efficacy/ safety outcome	Treatment	Rate[a,b,c] (Bio-naïve[d])	Rate difference (95% CI) UPA or VEDO vs PBO (Bio-naïve[d])	Rate difference (95% CI) UPA vs VEDO (Bio-naïve[d])	Rate[a, b,c] (Bio-failed)	Rate difference (95% CI) UPA or VEDO vs PBO (Bio-failed)	Rate difference (95% CI) UPA vs VEDO (Bio-failed)
AE/SAE/Serious infections (overall population)	UPA 45 mg /PBO	AE: 55.0%/50.2% SAE: 2.9%/3.8% Serious infections: 0.6%/0.4%	AE: 0.048 (−0.040, 0.136) SAE: −0.009 (−0.042, 0.023) Serious infections: 0.001 (−0.011, 0.014)	AE: 0.111 (−0.024, 0.246) SAE: 0.036 (−0.019, 0.091) Serious infections: 0.017 (−0.010, 0.044)			
	VEDO 300 mg /PBO	AE: 40.0%/46.3% SAE: 2.2%/6.7% Serious infections: 0.4%/2.0%	AE: −0.063 (−0.166, 0.039) SAE: −0.045 (−0.089, 0.000) Serious infections: −0.016 (−0.040, 0.008)				

[a]After weighting.
[b]Aggregated numbers from both induction studies.
[c]UPA data are individual level results while VEDO data are aggregated.
[d]Efficacy outcomes are based on bio-naïve pts and safety outcomes are based on the overall population. *P*-value equals *< 0.05, **≤0.01, ***< 0.001. Patient number (bio-naïve/bio-failed/all pts-safety): UPA 45 mg (262/292/562), placebo-UPA (132/147/286), VEDO (130/82/225), placebo-VEDO (76/63/149). AE, all adverse events; PBO, placebo; pts, patients; SAE, serious adverse events; UPA, upadacitinib; VEDO, vedolizumab.

S740

Efficacy and Safety of Upadacitinib Maintenance Therapy in Patients With Moderately to Severely Active Ulcerative Colitis: Final Results From the Phase 3 U-ACHIEVE Maintenance Study

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Introduction: Upadacitinib(UPA), has shown superior efficacy to placebo(PBO) in patients with moderate to severe active ulcerative colitis(UC) in two Phase 3 induction studies .[1,2] Patients demonstrating clinical response per Adapted Mayo score with UPA 45mg once daily(QD) after 8 weeks(wks) induction were enrolled to U-ACHIEVE Maintenance.
Methods: U-ACHIEVE Maintenance efficacy data from the intent-to-treat(ITT) population, defined as UPA 45mg QD 8wk induction responders enrolled per protocol for 52wk maintenance, and safety data from the safety population, defined as patients who received ≥1 dose of study therapy(ITT plus patients receiving up to 44wksmaintenanceper prior versions of protocol amendments).
Results: In ITT population, 681 patients achieving clinical response after 8wks of induction were re-randomized to UPA 15mg(UPA15; n=225), UPA 30mg (UPA30; n=233), or PBO(n=223) maintenance. A greater proportion of patients achieved primary endpoint of clinical remission at Wk 52 with UPA15(40.4%) and UPA30(53.6%) vs PBO(10.8%; both p< 0.001), and secondary endpoints including endoscopic improvement and remission, maintenance of clinical remission, steroid-free clinical remission, and histologic-endoscopic mucosal improvement(all p< 0.001; Table). Safety evaluation included 746 patients(UPA15, n=250; UPA30, n=251; PBO, n=245). Of these, 8.4% experienced a serious adverse event(AE) with UPA15, 8.4% UPA30, and 9.4% PBO; 4.0%, 7.2%, and 10.2% experienced AEs leading to treatment discontinuation, respectively. The most common AEs were worsening UC with UPA15(11.6%) and PBO(30.2%), and nasopharyngitis with UPA30(10.4%). There were no deaths. Serious infections were reported in 3.6% of UPA15 patients, 2.8% UPA30, and 3.3% PBO. Herpes zoster was reported only with UPA(UPA15, 4.8%; UPA30, 5.6%). Malignancies excluding non-melanoma skin cancer were reported by one patient with PBO and UPA15, and two with UPA30. Major adverse cardiovascular events were reported in one PBO patient and one UPA30(n=0, UPA15), and venous thromboembolic events were reported in two patients each with UPA15 and UPA30(n=0, PBO).
Conclusion: In UC patients who responded to induction therapy, both UPA15 and UPA30 were significantly more efficacious vs PBO as maintenance across primary and secondary endpoints. UPA doses were well tolerated, and there were no new safety signals with a larger population than previously reported.[3] These results are consistent with previously published data.[3]

Table 1.

Primary and key secondary endpoints at Week 52	PBO, n (%) [N] N=223	UPA 15 mg QD, n (%) [N] N=225	Adjusted difference vs PBO, % (95% CI)[a]	UPA 30 mg QD, n (%) [N] N=233	Adjusted difference vs PBO, % (95% CI)[a]
Primary endpoint: Clinical remission[b]	24 (10.8)	91 (40.4)	30.1*** (22.7, 37.4)	125 (53.6)	42.9*** (35.4, 50.4)
Maintenance of clinical response[c]	44 (21.5) [N=204]	129 (65.6) [N=197]	43.9*** (35.4, 52.5)	168 (77.5) [N=217]	55.6*** (47.8, 63.4)
Endoscopic improvement[d]	31 (14.1)	109 (48.5)	34.4*** (26.7, 42.1)	147 (63.3)	49.0*** (41.4, 56.7)
Maintenance of clinical remission[e]	16 (18.8) [N=85]	41 (53.6) [N=76]	34.9*** (21.2, 48.5)	57 (65.8) [N=87]	46.9*** (34.0, 59.8)
Corticosteroid-free clinical remission[f]	16 (18.8) [N=85]	40 (52.3) [N=76]	33.7*** (20.0, 47.3)	56 (64.6) [N=87]	45.5*** (32.6, 58.5)
Maintenance of endoscopic improvement[g]	21 (18.4) [N=115]	59 (61.2) [N=97]	42.2*** (30.4, 53.9)	84 (71.0) [N=118]	51.5*** (40.9, 62.1)
Endoscopic remission[h]	14 (6.1)	56 (24.9)	18.6*** (12.2, 25.0)	66 (28.3)	21.9*** (15.4, 28.5)
Histologic-endoscopic mucosal improvement[i] Mucosal healing[j]	27 (12.3) 11 (5.1)	91 (40.5) 42 (18.8)	28.5*** (21.1, 35.9) 13.5*** (7.8, 19.3)	131 (56.0) 53 (22.6)	43.8*** (36.1, 51.5) 17.2*** (11.2, 23,3)

***p< 0.001. The efficacy analysis was performed in patients who received up to 52 weeks' maintenance treatment (ITT population). Non-responder imputation incorporating multiple imputations to handle missing data due to COVID-19 was used.
[a]Based on adjusted Cochran–Mantel–Haenszel test adjusted for strata (corticosteroid use at Week 0 (yes or no), clinical remission status at Week 0 (yes or no), biologic-IR status at baseline (biologic-IR or non-biologic-IR)).
[b]Per Adapted Mayo score ≤2: stool frequency subscore ≤1 and not greater than induction baseline, RBS=0, and ES ≤1.
[c]Maintenance of clinical response, defined as a decrease in Adapted Mayo score ≥2 and ≥30% from induction baseline, plus a decrease in RBS ≥1 or an absolute RBS ≤1, at Week 52 among patients who achieved clinical response at the end of the induction therapy.
[d]ES ≤1.
[e]Maintenance of CR at Week 52 among patients with CR at the end of the induction therapy.
[f]CR at Week 52 and corticosteroid-free for ≥90 days prior to Week 52 among patients with CR at the end of the induction therapy.
[g]Endoscopic improvement at Week 52 among patients with endoscopic improvement at the end of the induction therapy.
[h]ES=0.

[i]ES ≤1 and Geboes score ≤3.1.
[j]ES=0 and Geboes score < 2.0.
CI, confidence interval; CR, clinical remission; ES, endoscopic subscore; IR, inadequate responders; ITT, intent-to-treat; PBO, placebo; QD, once daily; RBS, rectal bleeding subscore; UPA, upadacitinib.

S741

Sweet Syndrome Associated With Active Inflammatory Bowel Disease: A Case Series of a Rare Extra-Intestinal Manifestation

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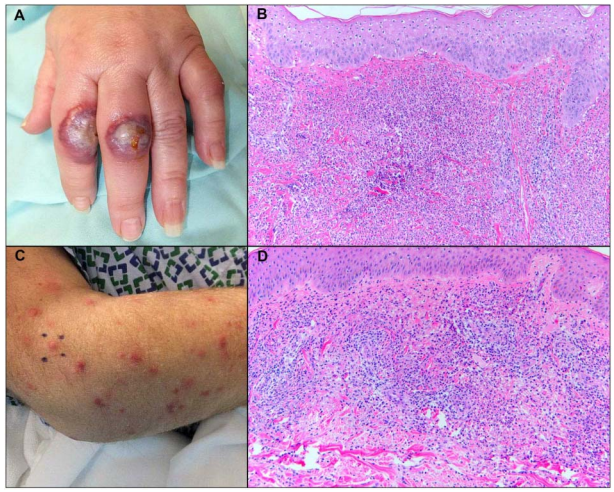
Introduction: Cutaneous extra-intestinal manifestations (EIM) occur in up to 20% of patients with IBD. Information about Sweet syndrome(SS)'s clinical course as a rare cutaneous EIM in IBD is limited to case reports. We represent the largest retrospective cohort on the occurrence and management of SS in IBD.
Methods: Patients age > 18 years with diagnoses of IBD and SS were identified at a quaternary center from 1980 to March 2021 using ICD-10 codes. Subsequent manual chart review selected for all adult IBD patients with histopathology-proven SS as the gold standard. Demographics, clinical IBD history, and SS-related clinical, laboratory, histopathological, treatment, and outcome data were collected. Global IBD disease activity was inferred from the reported symptoms, laboratory, imaging, endoscopic and histologic data at the last pre-SS physician outpatient assessment. Azathioprine(AZA) induced SS was defined as new AZA exposure within 4 weeks of SS occurrence.
Results: A total of 25 IBD patients with SS were identified including 3 patients which had AZA-induced SS. Majority of SS patients were female (72%). Sixteen patients had CD (64%), eight had UC (32%) and one had IBD unclassified (Table). The median age of diagnosis was 47 years (IQR 33-54 years) and SS appeared at a median of 6.4 years after IBD diagnosis. IBD patients with SS had a high rate of complicated IBD phenotypes (75% extensive colitis in UC and 73%stricturing or penetrating disease in CD, with 100% colonic involvement). SS occurrence correlated with global IBD disease activity as 83% of patients had active IBD at the time of diagnosis. Most common SS associated symptoms included fevers (54%), arthralgia (50%), ocular symptoms (21%), and myalgias (13%) (Figure). Corticosteroids are an effective therapy for SS in IBD. The recurrence rate of SS was 36%.
Conclusion: Contrary to previous case reports, SS was a cutaneous EIM of IBD that occurred later than 5 years after diagnosis in our cohort with occurrences paralleling global IBD disease activity. Although AZA-induced and IBD-associated SS were both effectively treated with corticosteroids, distinguishing them is relevant for future IBD treatment strategies. Despite its low frequency, SS may indicate an unrecognized IBD flare and affect IBD therapy choices. Larger SS-enriched IBD cohorts are needed to tease out unique clinical and histopathological patterns that could help clinicians differentiate SS/IBD subtypes, and optimize treatment approaches in IBD and SS co-occurrences.



[0741] **Figure 1.** Examples for Sweet syndrome cases: (A) 54-year-old woman with Ulcerative colitis (UC) for 6 years developed painful, erythematous papules with bullous formation overlying the proximal interphalangeal joints of several fingers associated with edema of the involved digits. She had similar lesions on her face and arms, and this was associated with a flare of her UC. (B) A lesional biopsy from her left arm demonstrated a dense, dermal inflammatory infiltrate composed almost entirely of neutrophils with karyorrhectic debris (leukocytoplasia) and without evidence of vasculitis, consistent with Sweet syndrome. Additional stains were negative for the presence of infectious organisms. (C) 63-year-old man with Crohn's disease, relapsing polychondritis, and psoriatic arthritis hospitalized for active colitis developed erythematous papules on his trunk and extremities in association with fever within several days of a total colectomy and end ileostomy. (D) A lesional biopsy from his right shoulder revealed a dermal inflammatory infiltrate predominantly composed of neutrophils with karyorrhectic debris, admixed with lymphocytes and histiocytes. Vasculitis or evidence of infection was not identified with further studies, and the patient was diagnosed with Sweet syndrome.

Table 1. Patient demographics, clinical features, and management of sweet syndrome in inflammatory bowel disease cohort

Factor	Overall (N=25)		Crohn's Disease (N=16)		Ulcerative Colitis & IBD unclassified (N=9)	
	N	Statistics	N	Statistics	N	Statistics
Demograpics						
Female, n (%)	25	18 (72)	16	11 (69)	9	7 (78)
Age at Diagnosis SS, Median (IQR), yrs	24	47 (33-54)	16	48 (38-54)	8	43 (32-56)
Age at Diagnosis IBD, Median (IQR), yrs	25	37 (28-47)	16	40 (27-47)	9	35 (28-47)
Race: White, n (%)	25	25 (100)	16	16 (100)	9	9 (100)
IBD Clincial Features						
SS Occurrence in Terms of IBD, n (%)	25		16		9	
SS and IBD diagnosed at same presentation		1 (4)		1 (6)		0 (0)
>3 Months After IBD Dx		24 (96)		15 (94)		9 (100)
Global IBD Clinical Activity at SS Diagnosis, n (%)	18		13		5	

Table 1. (*continued*)

Factor	Overall (N=25)		Crohn's Disease (N=16)		Ulcerative Colitis & IBD unclassified (N=9)	
	N	Statistics	N	Statistics	N	Statistics
Active		15 (83)		10 (77)		5 (100)
Inactive		3 (17)		3 (23)		0 (0)
Prior IBD Surgeries, n (%)	25	14 (56)	16	11 (69)	9	3 (33)
History of Extraintestinal Manifestations, n (%)	25	15 (60)	16	8 (50)	9	7 (78)
Peripheral Arthropathy type 1		4 (16)		1 (6)		3 (33)
Peripheral Arthropathy type 2		5 (20)		3 (19)		2 (22)
Pyoderma Gangrenosum		2 (8)		1 (6)		1 (11)
Oral Aphthous Ulcers		2 (8)		0 (0)		2 (22)
Ocular (Uveitis/Iritis/Episcleritis)		3 (12)		1 (6)		2 (22)
Primary Sclerosing Cholangitis		2 (8)		2 (12)		0 (0)
Other		6 (24)		5 (31)		1(11)
SS Clinical Features						
SS Rash Description, n (%)	24		16		8	
Maculopapular		15 (63)		11 (69)		4 (50)
Plaques		7 (29)		6 (37)		1 (12)
Pustules		8 (33)		6 (37)		2 (25)
Nodules		6 (25)		2 (12)		4 (50)
Pseudo-vesicles		4 (17)		4 (25)		0 (0)
Bullae		3 (13)		1 (6)		2 (25)
Location of SS Lesions, n (%)	24		16		8	
Upper Limbs		17 (70)		11 (69)		6 (75)
Lower Limbs		15 (63)		10 (62)		5 (62)
Torso and Back		12 (50)		9 (56)		3 (37)
Head and Neck		8 (33)		5 (31)		3 (37)
Dorsal Hands		3 (13)		2 (12)		1 (12)
Painful Lesion, n (%)	24	13 (54)	16	9 (56)	8	4 (50)
Pruritic Lesions, n (%)	24	8 (33)	16	6 (37)	8	2 (25)
SS Histopathological Features						
Time from SS Symptoms Onset to Biopsy, Median (IQR), days	24	16.5 (5.5-62.75)	16	10.5 (4-35)	8	30.5 (18-143)
Biopsy Findings, n (%)	24		15		8	
Neutrophilic Infiltrates		24 (100)		15 (100)		8 (100)
Lymphocytes		9 (38)		7 (47)		2 (25)
Eosinophils		4 (17)		2 (13)		2 (25)
Macrophages/Histiocytes		3 (13)		2 (13)		1 (12)
Type of SS on Histopathology, n (%)	24		15		9	
Classical		21 (87)		13 (87)		8 (89)
Bullous		3 (13)		2 (13)		1 (11)
SS Laboratory Features†						
Neutrophilia (ANC >6000), n (%)	18	12 (67)	10	6 (60)	8	6 (75)
Anemia (Hb < 13 g/dL in M, < 12 g/dL in F), n (%)	20	16 (80)	11	11 (100)	9	5 (55)
Abnormal Platelet (< 150 OR >500 plt./μL), n (%)	19	5 (26)	11	3 (27)	8	2 (25)
ESR, Median (IQR), mm/hr	13	46 (26-81)	5	32 (29-46)	8	66 (24.5-86.7)
CRP, Median (IQR), mg/dL	10	5.6 (2.1-10.6)	3	1.9 (1-9.3)	7	8 (2.8-10.3)
ANA positive, n (%)	8	2 (25)	4	1 (25)	4	1 (25)
ANCA positive, n (%)	3	1 (33)	2	0 (0)	1	1 (100)
SS Management						
Hospitalized During SS Episode, n (%)	25	10 (40)	16	8 (50)	9	2 (22)
Steroid Use for Treatment of SS, n (%)	25	21 (84)	16	13 (81)	9	8 (89)
Oral Steroids	20	12 (60)	13	7 (54)	7	5 (71)
IV Steroids With Any Other Form	20	5 (25)	13	3 (23)	7	2 (29)
Topical Steroids	20	1 (5)	13	1 (8)	7	0 (0)
Oral and Topical Steroids	20	2 (10)	13	2 (15)		0 (0)
Duration of Steroid Treatment, Median (IQR), days	12	25 (16.5-39)	9	21 (15-38)	2	25 (25-104.5)
Other Non-Steroidal Therapies, n (%)	25		16		9	
Dapsone		3 (12)		0 (0)		3 (33)

Table 1. (*continued*)

Factor	Overall (N=25)		Crohn's Disease (N=16)		Ulcerative Colitis & IBD unclassified (N=9)	
	N	Statistics	N	Statistics	N	Statistics
NSAID		1 (4)		1 (6)		0 (0)
AZA (Concomitant IBD and SS Therapy)		2 (8)		0 (0)		2 (22)
Duration of SS Symptoms, median (IQR), days	19	45 (23.5-95)	13	27 (20-89)	6	79 (58-162.2)

AZA: azathioprine; IBD: inflammatory bowel disease; IQR: interquartile range; LFT: liver function tests; SS: Sweet syndrome; Dx: diagnosis.
†Laboratory findings were taken within a week of SS presentation before administration of SS therapy.

S742

Inflammatory Bowel Disease Population Analyzer Tool for Health Systems (IBD PATH): A Case Study Risk Stratifying IBD Patients for Clinical Outcomes

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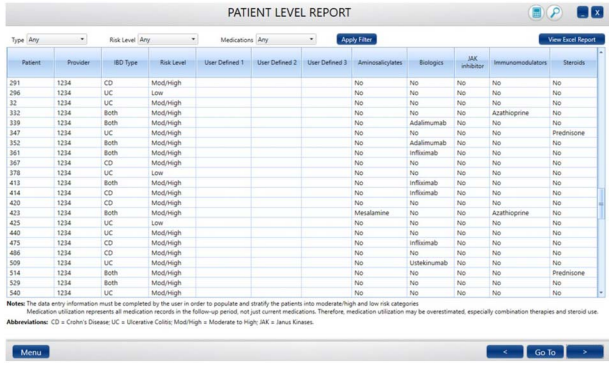
Introduction: Inflammatory bowel disease (IBD) is associated with substantial economic burden and it's increasing prevalence will only exacerbate the costs. Population health management (PHM) strategies like risk stratification are needed to increase quality of care and improve health outcomes while reducing costs. Risk stratification is also integral for IBD patient management according to care pathways/guidelines. Previous research suggests risk stratification using American Gastroenterological Association (AGA) care pathways was infrequently documented. IBD PATH was developed to identify patient risk and potential gaps in care using electronic medical record (EMR) data. We used IBD PATH to conduct a real-world case study to identify data standardization gaps and facilitate PHM efforts within Ochsner Health (Ochsner).
Methods: Ochsner data included patients with IBD visits between Jan. 2020 and Dec. 2021 and data variables; medication name and ordered date, visit dates and associated diagnosis and procedure codes. Using a standardized template included in IBD PATH, a subset of patients had additional unstructured clinical data from EMR converted into structured data. These variables are based on AGA care pathway risk factors for Crohn's disease (CD) and ulcerative colitis (UC) complications. The EMR dataset, formatted per the tool specifications, was uploaded into the tool. Descriptive analyses were performed through IBD PATH.
Results: AGA risk was not documented in the EMR. Unstructured risk factors were collected for a total of 164 patients (124 CD, 71 UC), Table. Majority of cases (82% CD, 77% UC) were classified as moderate(mod)/high risk and the primary risk factors perianal disease for CD and previous steroid-requiring disease for UC. While 30% of mod/high risk patients had a biologic medication record, nearly 50% did not have a IBD treatment record. Evidence of steroid and narcotic analgesic use was high in those with mod/high risk. Mod/high risk patients were also more likely to have had IBD-related hospitalizations, emergency department visits, and procedures in the follow-up period. (Figure)
Conclusion: Risk stratification of patients with IBD is not explicitly documented in the EMR. Ochsner population is nearly 36% Black, who have been found to have more perianal disease. Tools such as IBD PATH can inform PHM of patients diagnosed with IBD, facilitating the identification of potential population level gaps in care for further assessment. Results are dependent on the completeness of data uploaded.



[0742] **Figure 1.** Patient-Level Report

Table 1. **IBD Risk Level Characteristics, Medication Use, and Quality Indicators**

	Crohn's Disease			Ulcerative Colitis		
	Total N=124	Moderate/ High Risk N=102	Low Risk N=22	Total N=71	Moderate/ High Risk N=55	Low Risk N=16
AGA Risk Level Characteristics, n (%)						
Crohn's Disease Risk Factors						
Age < 30 years at diagnosis	22 (18)	22 (22)	—			
Extensive anatomic involvement	7 (6)	7 (7)	—			
Perianal disease	83 (67)	83 (81)	—			
Severe rectal disease	32 (26)	32 (31)	—			
Deep ulcers	9 (7)	9 (9)	—			
Previous surgical resection	0 (0)	0 (0)	—			
Stricturing behavior	17 (14)	17 (17)	—			
Penetrating behavior	24 (19)	24 (24)	—			
Ulcerative Colitis Disease Risk Factors						
Age < 40 years				16 (23)	16 (29)	—
Extensive colitis				33 (46)	33 (60)	—
Steroid-requiring disease				43 (61)	43 (78)	—
Deep ulcers				2 (3)	2 (4)	—

Table 1. (*continued*)

	Crohn's Disease			Ulcerative Colitis		
	Total N=124	Moderate/ High Risk N=102	Low Risk N=22	Total N=71	Moderate/ High Risk N=55	Low Risk N=16
History of hospitalization				4 (6)	4 (7)	—
High CRP and ESR				0 (0)	0 (0)	—
Clostridium difficile infection				4 (6)	4 (7)	—
Cytomegalovirus infection				1 (1)	1 (2)	—
Medication Utilization, n (%)						
Biologics	38 (31)	35 (92)	3 (8)	16 (23)	16 (100)	7 (13)
Adalimumab	12 (32)	10 (83)	2 (17)	5 (31)	5 (100)	0 (0)
Immunomodulators	1 (8)	0 (0)	1 (100)	1 (20)	1 (100)	0 (0)
Steroids	2 (17)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)
Certolizumab pegol	0 (0)	0 (0)	0 (0)	1 (6)	1 (100)	0 (0)
Immunomodulators	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Steroids	0 (0)	0 (0)	0 (0)	1 (100)	1 (100)	0 (0)
Golimumab				1 (6)	1 (100)	0 (0)
Immunomodulators				0 (0)	0 (0)	0 (0)
Steroids				0 (0)	0 (0)	0 (0)
Infliximab	14 (56)	14 (100)	0 (0)	2 (13)	2 (100)	0 (0)
Immunomodulators	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Steroids	2 (14)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)
Vedolizumab	10 (26)	9 (90)	1 (10)	5 (31)	5 (100)	0 (0)
Immunomodulators	1 (10)	0 (0)	1 (100)	1 (20)	1 (100)	0 (0)
Steroids	1 (10)	1 (100)	0 (0)	1 (20)	1 (100)	0 (0)
Ustekinumab	3 (8)	3 (100)	0 (0)	3 (19)	3 (100)	0 (0)
Immunomodulators	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Steroids	1 (33)	1 (100)	0 (0)	1 (33)	1 (100)	0 (0)
Immunomodulators	5 (4)	3 (60)	2 (40)	4 (6)	3 (75)	1 (25)
Azathioprine	5 (100)	3 (60)	2 (40)	4 (100)	3 (75)	1 (25)
5-Aminosalicylic acids				12 (17)	9 (75)	3 (25)
Mesalamine				10 (83)	7 (70)	3 (30)
Sulfasalazine				2 (17)	2 (100)	0 (0)
Steroids	16 (13)	15 (94)	1 (6)	9 (13)	9 (100)	0 (0)
Quality Indicators, n (%)						
IBD-related Hospitalizations	25 (20)	22 (88)	3 (12)	8 (11)	7 (88)	1 (13)
IBD-related Emergency Department visits	55 (44)	47 (85)	8 (15)	21 (30)	17 (81)	4 (19)
IBD-related Surgeries	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
IBD-related Procedures	50 (40)	43 (86)	7 (14)	23 (32)	20 (87)	3 (13)
No evidence of steroid therapy	108 (87)	87 (81)	21 (19)	62 (87)	46 (74)	16 (26)
Evidence of steroid therapy	16 (13)	15 (94)	1 (6)	9 (13)	9 (100)	0 (0)
Evidence of psychosocial screening	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Evidence of narcotic analgesic use	107 (86)	94 (88)	13 (12)	48 (68)	35 (77)	11 (23)

S743

Efficacy and Safety of Ustekinumab for Ulcerative Colitis Through 4 Years: Final Results From the UNIFI Long-Term Extension

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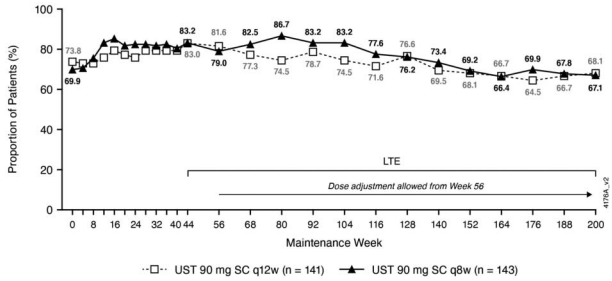
Introduction: Ustekinumab (UST) is approved for moderate to severe ulcerative colitis (UC) treatment. Here we report final results of the UNIFI long-term extension (LTE) study with efficacy and safety through 4 years (yrs) of subcutaneous (SC) UST treatment.
Methods: Overall, 523 intravenous UST induction responders were randomized to SC maintenance therapy: 175 SC placebo (PBO); 172 UST 90mg every 12 weeks (q12w); 176 UST 90mg q8w. The nonrandomized population included UST induction nonresponders at week (wk) 8 who received SC UST, responded 8wks later and continued receiving UST q8w, and PBO induction responders continuing PBO. Patients (pts) completing wk44 were eligible to continue treatment in LTE. PBO pts discontinued after study unblinding. Starting at wk56, randomized pts with UC worsening could adjust to q8w. Efficacy was evaluated in UST-randomized pts (n=284) using symptomatic remission (Mayo stool frequency subscore 0/1 and rectal bleeding subscore 0). Safety was evaluated for all 588 pts treated in LTE (randomized/nonrandomized populations).
Results: Among all pts randomized to UST at maintenance baseline (intent-to-treat population with nonresponder imputation for missing data and treatment failure criteria), 55.2% were in symptomatic remission at wk200 (biologic naïve 67.2%; biologic failure 41.6%; Table); 53.2% achieved corticosteroid-free symptomatic remission at wk200. Overall, 42.7% of biologic failure and 18.8% of biologic naïve pts randomized to UST and treated in the LTE discontinued treatment between wks44 and 200. Among randomized pts who continued UST in the LTE, 67.6% were in symptomatic remission at wk200; 72.9% of those in clinical remission at wk44 were in symptomatic

remission at wk200; and 85.1% of pts with observed data at wk200 were in symptomatic remission. Safety events were similar between UST-treated pts and PBO throughout study. Maintenance wks0-220 included 1647.4 (UST) and 301.7 (PBO) pt yrs of follow-up. Safety events per 100 pt yrs of follow-up for UST vs PBO were adverse events (AEs): 214.45 vs 288.04, serious AEs: 7.22 vs 10.61, and serious infections: 2.00 vs 3.31. During the final yr of the LTE, no deaths or major cardiovascular events were reported in UST pts. Among UST pts, 2 cases of colorectal cancer and 1 case of cytomegalovirus were reported. (Figure)

Conclusion: Pts receiving SC UST generally maintained clinical benefit through 4 yrs. No new safety signals were observed. (Figure)



[0743] **Figure 1.** Symptomatic Remission of Randomized Patients in Maintenance Who Were Treated in Long-Term Extension (LTE) Through Week 200 (a,b,c). Symptomatic remission: Mayo stool frequency subscore of 0 or 1 and a rectal bleeding subscore of 0; SC: subcutaneous; q8w: every 8 weeks; q12w: every 12 weeks. a) Patients who had both stool frequency and rectal bleeding subscores missing at a visit were considered not to be in symptomatic remission for that visit. b) Randomized group at maintenance Week 0 regardless of whether patients had a dose adjustment during the long-term extension. c) Patients who had an ostomy or colectomy, or discontinued study agent due to lack of therapeutic effect or due to an adverse event of worsening of ulcerative colitis prior to the designated visit were considered not to be in symptomatic remission.

Table 1. Symptomatic remission[a] rates during the LTE in randomized patients

Analysis	90 mg UST SC q12w[b]	90 mg UST SC q8w[b]	Overall UST
Symptomatic remission in the ITT population[c,d,e] (treatment failure and missing data nonresponder imputation)			
Week 44, n/N (%)	107/172 (62.2)	119/176 (67.6)	226/348 (64.9)
Week 200, n/N (%)	96/172 (55.8)	96/176 (54.5)	192/348 (55.2)
Symptomatic remission in biologic naïve[f] patients			
Week 44, n/N (%)	68/95 (71.6)	57/79 (72.2)	125/174 (71.8)
Week 200, n/N (%)	62/95 (65.3)	55/79 (69.6)	117/174 (67.2)
Symptomatic remission in biologic failure[f] patients			
Week 44, n/N (%)	34/70 (48.6)	57/91 (62.6)	91/161 (56.5)
Week 200, n/N (%)	30/70 (42.9)	37/91 (40.7)	67/161 (41.6)
Corticosteroid-free symptomatic remission in the ITT population[c,d,e,g]			
Week 44, n/N (%)	105/172 (61.0)	116/176 (65.9)	221/348 (63.5)
Week 200, n/N (%)	94/172 (54.7)	91/176 (51.7)	185/348 (53.2)
Symptomatic remission in patients treated in the LTE (treatment failure and missing data nonresponder imputation)[d,e]			
Week 44, n/N (%)	117/141 (83.0)	119/143 (83.2)	236/284 (83.1)
Week 200, n/N (%)	96/141 (68.1)	96/143 (67.1)	192/284 (67.6)
Symptomatic remission up to the time of dose adjustment with treatment failure rules applied in patients treated in the LTE[d] (modified as observed[h])			
Week 44, n/N (%)	117/141 (83.0)	119/143 (83.2)	236/284 (83.1)
Week 200, n/N (%)	58/65 (89.2)	73/89 (82.0)	131/154 (85.1)

AE, adverse event; ITT, intent-to-treat; LTE, long-term extension; q8w, every 8 weeks; q12w, every 12 weeks; SC, subcutaneous; TNF, tumor necrosis factor; UC, ulcerative colitis; UST, ustekinumab.
[a]Symptomatic remission is defined as a stool frequency subscore of 0 or 1 and a rectal bleeding subscore of 0.
[b]Randomized group at maintenance Week 0 regardless of whether or not patients had a dose adjustment during the long-term extension.
[c]Patients who had a prohibited change in UC medication, an ostomy or colectomy, or used a rescue medication after clinical flare, or discontinued study agent due to lack of therapeutic effect or due to an AE of worsening of UC prior to the Week 44 visit were considered not to be in symptomatic remission at Week 44.
[d]Patients who had an ostomy or colectomy, or discontinued study agent due to lack of therapeutic effect or due to an AE of worsening of UC after Week 44 and prior to Week 200, were considered not to be in symptomatic remission at Week 200.
[e]Patients who had both stool frequency and rectal bleeding subscores missing at a visit were considered not to be in symptomatic remission for that visit.
[f]Efficacy was evaluated only in patients with a history of biologic failure to ≥1 biologic (anti-TNFα or integrin antagonist) and those who were biologic naïve; 7 UST q12w and 6 UST q8w patients who were biologic-experienced but did not have documentation of a history of biologic failure are excluded.
[g]Patients who had a missing value in corticosteroid use had their last value carried forward.
[h]The observed data excluded patients with missing data and had not had treatment failure (i.e., an ostomy or colectomy, or discontinued study agent due to lack of therapeutic effect or due to an AE of worsening of UC) prior to the designated visit.

S744

QUASAR Induction Study 1 Cumulative Response to Guselkumab in Patients With Moderately to Severely Active Ulcerative Colitis

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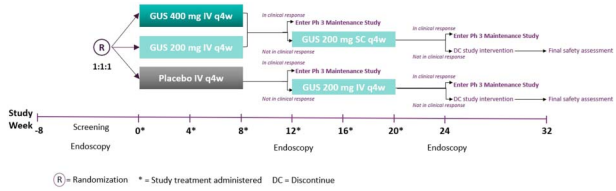
Introduction: Guselkumab (GUS), an IL-23p19 antagonist, had greater efficacy than placebo (PBO) in achieving clinical response and clinical remission at Week (Wk) 12 in the randomized, controlled Phase 2b QUASAR Induction Study 1 (NCT04033445) in patients with moderately to severely active ulcerative colitis (UC).[1] Patients who were not in clinical response at Wk 12 received GUS treatment through Wk 24. Here, we report GUS cumulative efficacy and safety results for Induction Study 1.
Methods: Eligible patients had moderately to severely active UC (modified Mayo score of 5 to 9 with a Mayo endoscopy subscore ≥2) at baseline. Patients were randomized 1:1:1 to IV GUS 200mg, 400mg, or PBO at Wks 0, 4, and 8. Patients who were not in clinical response to IV induction at Wk 12 received GUS treatment (PBO IV→GUS 200mg IV; GUS 200mg IV→GUS 200mg SC; GUS 400mg IV→GUS 200mg SC) at Wks 12, 16, and 20 and were evaluated at Wk 24 (Figure). Matching IV or SC PBO was administered to maintain the blind.
Results: Three hundred thirteen patients were randomized and treated at baseline. Demographic and disease characteristics at baseline were similar among the treatment groups, and approximately 50% had a prior inadequate response or intolerance to advanced UC therapy. At Wk 12, clinical response was achieved by 61.4% (62/101) and 60.7% (65/107) of patients randomized to GUS 200mg and GUS 400mg IV vs 27.6 % (29/105) of patients randomized to PBO IV (both p< 0.001). Of the patients in the GUS groups who were not in clinical response at Wk 12, 54.3% (19/35) in the GUS 200mg IV→200mg SC group and 50.0% (19/38) in the GUS 400mg IV→200mg SC group achieved clinical response at Wk 24. Clinical response at Wk 12 or 24 was achieved by 80.2% of patients who were randomized to GUS 200mg IV and 78.5% of patients who were randomized to GUS 400mg IV. For patients who received PBO IV→GUS 200mg IV, clinical response at Wk 24 (65.2%) was similar to Wk 12 clinical response following GUS 200mg IV induction (61.4%). The most frequent adverse events among all GUS-treated pts (n=274) were anemia (7.7%), headache (5.1%), worsening UC (4.4%), COVID-19 (3.6%), arthralgia (2.9%) and abdominal pain (2.6%) which are consistent with Wk 12 results.
Conclusion: Overall, approximately 80% of patients randomized to receive GUS achieved clinical response at Wk 12 or 24. Continued treatment with SC GUS allowed 50-54.3% of IV GUS Wk 12 clinical nonresponders to achieve clinical response at Wk 24. No new safety concerns for GUS were identified.



[0744] **Figure 1.** QUASAR Induction Study 1: Study Design

S745

Differential and Combinatorial Mechanism of Action of Golimumab and Guselkumab in Ulcerative Colitis Induction Therapy: IL-23 Blockade Drives Restoration of Normal Epithelium and Mucosal Healing

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Introduction: We studied the underlying mechanism of action of golimumab (GOL), a tumor necrosis factor alpha (TNFα) antagonist, guselkumab (GUS), an interleukin (IL)-23 inhibitor, and the combination (GUS+GOL) in a randomized Ph2 induction study in TNFα-naïve patients (pts) with moderately-severely active ulcerative colitis (UC) (VEGA; NCT03662542).
Methods: Colon biopsies were obtained at screening and at Wk12 in pts who received GOL (n=48), GUS (n=52) or GUS+GOL (n=50). Tissue transcriptional profiles were determined with RNA-seq. Differentially expressed genes were analyzed in the context of cell-type specific transcriptional modules by first defining a gene correlation network and unsupervised network clustering. A method to create a single-cell-derived co-expression network was developed using published UC single-cell data to provide high resolution gene modules associated with specific cell types and pathways. Gene set variation analysis (GSVA) was used to assess changes in specific biologic modules in the context of responder/non-responder analyses.
Results: By Wk12, combination therapy induced a greater magnitude of transcriptional changes in the colon compared with each monotherapy (Table). These genes were associated with IL-23/Th17/myeloid-related processes, inflammation, and epithelial homeostasis. Significant changes were observed in Th17 cell and inflammatory epithelial cell modules in pts achieving endoscopic improvement (subscore 0 or 1) at Wk12 compared with non-responders. Change from baseline was greater in the GUS monotherapy and GUS+GOL arms compared with GOL alone. Changes were consistent with a decrease in crypt destruction in responders at Wk12 as observed by histologic changes in the Geboes score. Genes modulated by GUS+GOL indicated greater suppression of inflammation, particularly myeloid cell activation and inflammatory fibroblast development. Genes modulated by either GUS or GUS+GOL were associated with increased epithelial normalization and decreased Th17 activity compared to GOL alone.
Conclusion: Combination induction with GOL+GUS for 12 weeks drove a greater reduction in inflammation and improvement in epithelial homeostasis compared to each monotherapy, demonstrating differential and complementary mechanisms of action of TNFα and IL-23 blockade. Combination therapy drives a significant increase in the overall magnitude of response with marked improvement in the restoration of normal epithelium.

Table 1. Differentially Expressed Genes at Week 12 compared with baseline pre-treatment. P-values associated with GSVA enrichment of biologic modules associated with endoscopic response and at Week 12

	Golimumab	Guselkumab	Combination
Numbers of genes up at Week 12	633	495	4,776
Numbers of genes down at Week 12	709	613	4,867
Th17 module: Responder vs Non-Responder Week 12 (p-value)	< 0.001	< 0.001	< 0.001
Th17 module: Responder Week 12 vs Baseline (p-value)	< 0.05	< 0.001	< 0.001
Th17 module: Non-Responder Week 12 vs Baseline (p-value)	NS	0.01	< 0.001
Epithelial module: Responder vs Non-Responder Week 12 (p-value)	< 0.01	< 0.001	< 0.001
Epithelial module: Responder Week 12 vs Baseline (p-value)	< 0.05	< 0.001	< 0.001
Epithelial module: Non-Responder Week 12 vs Baseline (p-value)	NS	< 0.01	< 0.001

S746

Humoral Immune Responses to SARS-CoV-2 Vaccines in an Ozanimod Open-Label Extension Study

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Introduction: Ozanimod (OZA), an oral S1P receptor modulator, is approved in the US and EU for the treatment of moderately to severely active ulcerative colitis (UC) and relapsing multiple sclerosis (RMS). A previous analysis of data from UC and multiple sclerosis (MS) open-label extension (OLE) studies showed that most patients (pts) with confirmed coronavirus infection (COVID-19) had nonserious infections, recovered, and did not require OZA discontinuation. As some immunomodulators and biologics may attenuate severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccine response, this analysis evaluated humoral immune responses and predictors of response to SARS-CoV-2 vaccination in pts with RMS treated with OZA.
Methods: RMS participants who completed a phase 1-3 OZA trial could enter an OLE trial (DAYBREAK; NCT02576717) of OZA 0.92 mg/d. This analysis (January 2020–;October 2021) included DAYBREAK participants receiving mRNA or non-mRNA SARS-CoV-2 vaccines (1-2 doses, vaccine-dependent) with no evidence of recent infection (ie, nucleocapsid antibody negative). Receptor binding domain (RBD)

antibody titers were analyzed (Elecsys Anti-SARS-CoV-2 assay; Roche Diagnostics, Basel, Switzerland) prevaccination, after 1 dose, and < 4, 4-8, 8-12, and >12 weeks after full vaccination. Fisher's exact tests and regression models determined association with seroconversion and log2 antibody levels.

Results: Demographics were similar between the mRNA and non-mRNA vaccine recipients (Table). Seroconversion (≥0.8 U/mL spike RBD antibody) occurred in 100% (80/80) of fully vaccinated mRNA and 62% (18/29) of fully vaccinated non-mRNA vaccine recipients. Higher spike RBD antibody levels were seen with mRNA (grand mean: 512.6 U/mL, range: 1.3-4572) vs non-mRNA (grand mean: 39.3 U/mL, range: 0.4-368.5) vaccines at all time points studied. Vaccination with a non-mRNA vaccine predicted lower antibody levels (beta: -5.90 [95% CI: -6.99 to -4.82]; $P< 0.0001$) and less seroconversion (Fisher's exact: $P< 0.0001$) whereas age, sex, body mass index, and absolute lymphocyte count (ALC) did not.

Conclusion: Participants receiving OZA developed humoral immune response to SARS-CoV-2 vaccines, with 100% seroconversion after mRNA vaccination; this was independent of demographic characteristics and ALC levels at time of vaccination. However, some participants developed lower antibody concentrations and may benefit from booster doses. These findings provide important information for physicians managing OZA-treated pts with UC or MS.

Table 1. Demographics and clinical characteristics of fully vaccinated participants

Characteristics	mRNA vaccine recipients (n=80)	Non-mRNA vaccine recipients (n=29)
White, n (%)	78 (97.5)	29 (100.0)
Non-Hispanic, n (%)	76 (95.0)	28 (96.6)
Eastern European, n (%)	41 (51.3)	22 (75.9)
Age, years, mean (range)	40.4 (23-56)	41.6 (28-56)
BMI, kg/m^2, mean (range)	24.6 (16.8-42.0)	25 (17.3-33.8)
Female, %	74%	72%
Days on OZA, mean, days (range)	1676.9 (1398-1967)	1620.5 (1448-1869)

BMI, body mass index; CI, confidence interval.

S747

Mirikizumab Improves Mental and Physical Health Outcomes in Patients With Moderately to Severely Active Ulcerative Colitis: Results From the Phase 3 LUCENT-1 Induction and LUCENT-2 Maintenance Studies

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Introduction: Mirikizumab (miri), an anti-IL-23p19 monoclonal antibody, demonstrated efficacy vs. placebo (PBO) in adult patients (pts) with moderately to severely active ulcerative colitis (UC) in phase 3, randomized, double-blind, PBO-controlled 12-week (W) induction (LUCENT-1/NCT03518086) and 40-W maintenance (LUCENT-2/NCT03524092) studies.' Here we evaluated the effect of miri vs. PBO on Medical Outcomes Study 36-Item Short Form Health Survey (SF-36; version 2) scores.

Methods: In the induction study, 1162 pts who had an inadequate response/loss of response/intolerance to conventional/biologic therapy were randomized (3:1) to receive miri 300 mg IV (N=868) or PBO (N=294) every 4 weeks (Q4W). Pts who achieved clinical response with miri at W12 in the induction study (miri clinical responders; N=544) were re-randomized (2:1) to miri 200 mg subcutaneous (N=365) or PBO (N=179) Q4W through W40 (i.e., W52 of continuous therapy) in the maintenance study. Least squares mean (LSM) change from baseline in physical (PCS) and mental (MCS) component scores, and 8 domain scores (physical functioning, role-physical, role-emotional, bodily pain, vitality, social functioning, mental and general health) of the SF-36 survey were evaluated at W12 and W40. Treatment comparisons were made using analysis of covariance.

Results: During the induction period, significant improvements in PCS (LSM difference vs. PBO [95% CI]: 2.07 [1.21, 2.93]; p< 0.001) and MCS (1.60 [0.56, 2.63]; p=0.002), and all domain scores (p< 0.05) of SF-36 were achieved with miri vs. PBO at W12. These improvements in SF-36 scores were sustained throughout the maintenance period with significant improvements seen with miri vs. PBO group in PCS (2.30 [1.12, 3.49]; p< 0.001) and MCS (1.48 [0.13, 2.82]; p=0.031), and 6/8 domain scores (p< 0.05) at W40 (Table).

Conclusion: Miri significantly improves SF-36 mental and physical component scores in patients with moderately to severely active UC during induction (W12) and maintenance (W40).

Table 1. Change From Baseline (ANCOVA with mBOCF*) in SF-36 Physical and Mental Component Scores and Domain Scores at W12 and W40 (Modified Intent-to-treat Population)

	Induction (W12 analysis)				Maintenance (W40 analysis) Miri clinical responder			
	LSM (SE) change from baseline†		LSM Diff (95% CI) vs. PBO	p-value	LSM (SE) change from baseline†		LSM Diff (95% CI) vs. PBO	p-value
	PBO IV (N=294)	Miri 300 mg IV (N=868)			PBO SC (N=179)	Miri 200 mg SC (N=365)		
PCS	3.90 (0.393)	5.97 (0.242)	2.07 (1.21, 2.93)	< 0.001	6.66 (0.541)	8.97 (0.412)	2.30 (1.12, 3.49)	< 0.001
MCS	3.42 (0.472)	5.02 (0.291)	1.60 (0.56, 2.63)	0.002	5.54 (0.611)	7.02 (0.465)	1.48 (0.13, 2.82)	0.031
Domain scores								
Physical Functioning	6.57 (0.950)	10.16 (0.585)	3.59 (1.51, 5.67)	< 0.001	10.82 (1.221)	13.97 (0.928)	3.16 (0.48, 5.84)	0.021
Role-Physical	10.50 (1.304)	17.21 (0.803)	6.71 (3.86, 9.57)	< 0.001	18.51 (1.667)	26.14 (1.266)	7.63 (3.97, 11.28)	< 0.001
Role-Emotional	5.25 (1.135)	9.06 (0.701)	3.81 (1.33, 6.30)	0.003	10.35 (1.338)	12.95 (1.019)	2.60 (−0.34, 5.54)	0.083
Bodily Pain	13.40 (1.218)	18.43 (0.751)	5.03 (2.37, 7.70)	< 0.001	20.93 (1.663)	26.12 (1.263)	5.19 (1.54, 8.84)	0.005
Vitality	10.38 (1.059)	14.72 (0.652)	4.34 (2.02, 6.65)	< 0.001	16.85 (1.493)	21.54 (1.133)	4.70 (1.42, 7.97)	0.005
Social Functioning	11.69 (1.254)	16.74 (0.772)	5.05 (2.30, 7.79)	< 0.001	17.25 (1.487)	23.95 (1.129)	6.70 (3.44, 9.96)	< 0.001
Mental Health	6.55 (0.887)	9.56 (0.548)	3.00 (1.06, 4.94)	0.002	10.25 (1.233)	12.93 (0.940)	2.67 (−0.04, 5.38)	0.053
General Health	7.03 (0.959)	12.30 (0.592)	5.27 (3.17, 7.37)	< 0.001	14.23 (1.362)	19.83 (1.035)	5.59 (2.61, 8.58)	< 0.001

*Patients with missing values had their last value carried forward, with the exception that patients who discontinued due to an adverse event had their baseline value carried forward.
†Baseline for both Induction and Maintenance is defined as the last non-missing assessment recorded on or prior to the date of the first study drug administration at Visit 1 of Induction.
ANCOVA, analysis of covariance; CI, confidence interval; Diff, difference; IV, intravenous; LSM, least squares mean; MCS, mental component score; mBOCF, modified baseline observation carried forward; miri, mirikizumab; PBO, placebo; PCS, physical component score; SC, subcutaneous; SE, standard error; SF-36, medical outcomes study 36-Item short-form health survey; W, week.

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S748

Risankizumab Results in Improvements in Disease Activity Scores in Patients With Crohn's Disease: Post-Hoc Analysis of the Phase 3 Induction and Maintenance Studies

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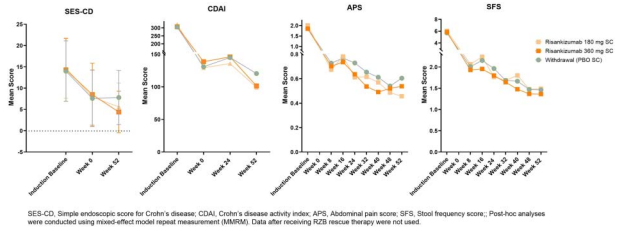
Introduction: The Phase 3 maintenance study (FORTIFY) was a re-randomized responder withdrawal study that demonstrated efficacy and safety of risankizumab (RZB), an anti-p19 IL-23 antibody, versus (vs) withdrawal/placebo (PBO) in patients with moderate to severe Crohn's disease (CD) who responded to RZB induction therapy. In this post-hoc analysis, we evaluated disease activity, as measured by Simple Endoscopic Score for CD (SES-CD), Crohn's Disease Activity Index (CDAI), and patient reported symptoms (PROs) of liquid stool frequency (SF) and abdominal pain score (APS), in patients who received up to 52 weeks (wks) of RZB or PBO in FORTIFY.
Methods: Patients enrolled in FORTIFY achieved clinical response to IV RZB induction therapy in ADVANCE and MOTIVATE studies. Clinical response was defined as ≥30% decrease in daily SF and/or ≥30% decrease in average daily APS from induction baseline [BL])both not worse than induction BL. In FORTIFY, patients were dosed Q8W with 180 mg subcutaneous (SC) RZB, 360 mg SC RZB, or PBO. For patients who entered FORTIFY, mean SES-CD and CDAI values were calculated at induction BL and at FORTIFY Wks 0, 24 (CDAI only), and 52; mean SF and APS were calculated from patient diary data at BL of induction and at Wks 8, 16, 24, 32, 40, 48, and 52 of FORTIFY. (Figure)
Results: At induction BL, mean SES-CD, CDAI, SF, and AP scores were similar between treatment groups. At FORTIFY Wk 0, disease activity scores improved from induction BL for all patients, consistent with an IV RZB induction responder population for FORTIFY. Over time, patients on RZB maintenance therapy demonstrated ongoing improvement in SES-CD and CDAI values, whereas mean SES-CD and CDAI values increased in the withdrawal/PBO group. A treatment effect was evident at Wk 52. For most timepoints throughout maintenance, patients receiving RZB showed numerically lower APS and SF (RZB 360 mg only) compared to patients in the withdrawal/PBO group.
Conclusion: Across the studies, RZB therapy led to marked improvements in disease activity over time and continued to show benefit compared to withdrawal/PBO at Wk 52. The pronounced benefit of RZB over withdrawal/PBO at Wk 52 for SES-CD, an objective endoscopic endpoint, contrasts with a relative lack of differentiation at Wk 52 for the subjective SF and AP endpoints. This is likely explained by residual exposure given the long half-life and pharmacodynamic effect of RZB following induction therapy, leading to prolonged symptom improvement in patients receiving PBO in maintenance.



[0748] **Figure 1.** SES-CD, CDAI, SF and AP scores over time for participants enrolled in the FORTIFY maintenance study, from induction (ADVANCE/MOTIVATE) baseline through FORTIFY Week 52

S749

Mirikizumab Improves Work Productivity and Activity Impairment Questionnaire Scores in Moderately-to-Severely Active UC: The LUCENT-1 and LUCENT-2 Randomized, Double-Blind, Placebo-Controlled Phase 3 Studies

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Introduction: This analysis compares mirikizumab (miri) to placebo (PBO) for improvement in the Work Productivity and Activity Impairment Questionnaire Ulcerative Colitis (WPAI:UC) in participants of LUCENT-1 and LUCENT-2, phase 3 clinical trials who had moderately-to-severely active UC and had failed prior conventional or biologic therapies.
Methods: 1162 patients (pts) in LUCENT-1 12-week induction study were randomized 3:1 to receive 300mg miri or PBO intravenously once every 4 weeks (Q4W). 544 pts who completed induction and achieved Modified Mayo Score (MMS) Clinical Response with miri were rerandomized 2:1 in LUCENT-2 to a 40W maintenance treatment of miri 200mg or PBO subcutaneously Q4W for a total of 52W treatment. Randomization was stratified by previous biologic therapy failure, baseline (BL) corticosteroid use, and region. Stratification for LUCENT-1 included BL disease activity, and LUCENT-2 included LUCENT-1 clinical remission status. WPAI:UC scores between 0%-100% were calculated from pts-reported measurements, with a higher score indicating greater impairment. Evaluations of the WPAI:UC domain of overall activity impairment included all respondents, while domains of absenteeism, presenteeism, and work productivity loss required employment at the time of the analyses. Changes from W0 BL at W12 (induction) and W40 (maintenance; 52W treatment) were evaluated by analysis of covariance. Stratification factors and BL scores were used as covariates. Results were reported as least squares mean differences (LSM diff) of miri vs PBO.
Results: At BL, 60.67% (N=705) of pts reported employment. At W12 of induction, activity impairment, absenteeism, presenteeism, and work productivity loss were significantly reduced from BL in miri treated pts vs PBO (Table). Of the pts who achieved W12 MMS Clinical Response, those who continued receiving miri had sustained improvements in the WPAI:UC change from BL at W40 of maintenance vs those who received PBO, including activity impairment, presenteeism, and work productivity loss. Absenteeism was not significantly different between treatment groups at W40 (52W treatment).
Conclusion: Compared to PBO, miri treatment provided statistically significant improvements in work productivity and activity impairment as measured by the WPAI:UC. Improvements were observed during induction and maintenance therapy in pts with moderately-to-severely active UC who had failed prior conventional or biologic therapies.

Table 1. **Changes from Baseline in Work Productivity and Activity Impairment Questionnaire: Ulcerative Colitis Scores at Week 12 and Week 40 (52 Weeks of Continuous Treatment)**

	Activity Impairment of All Participants		Absenteeism from Work of Employed Participants		Presenteeism at Work of Employed Participants		Overall Work Impairment of Employed Participants	
	LSM Change from BL (SE)	LSM Diff[1] (SE)	LSM Change from BL (SE)	LSM Diff[1] (SE)	LSM Change from BL (SE)	LSM Diff[1] (SE)	LSM Change from BL (SE)	LSM Diff[1] (SE)
Induction Period Change from Baseline (Week 12)								
PBO IV Q4W (N=294)	−12.90 (1.41)		−3.45 (1.75)		−13.94 (1.75)		−14.91 (1.99)	
Miri 300 mg IV Q4W (N=868)	−20.90 (0.87)	−8.01 (1.57) ***	−7.88 (1.03)	−4.43 (1.95) *	−19.25 (1.03)	−5.31 (1.95) **	−20.65 (1.16)	−5.74 (2.20) **
Maintenance Period Change from Induction Baseline of Miri Induction Responders (Week 40; 52 Weeks of Continuous Therapy)								
PBO SC Q4W (N=179)	−22.91 (1.77)		−10.78 (1.68)		−19.82 (1.98)		−22.59 (2.26)	

Table 1. (*continued*)

	Activity Impairment of All Participants		Absenteeism from Work of Employed Participants		Presenteeism at Work of Employed Participants		Overall Work Impairment of Employed Participants	
	LSM Change from BL (SE)	LSM Diff[1] (SE)	LSM Change from BL (SE)	LSM Diff[1] (SE)	LSM Change from BL (SE)	LSM Diff[1] (SE)	LSM Change from BL (SE)	LSM Diff[1] (SE)
Miri 200 mg SC Q4W (N=365)	−32.46 (1.35)	−9.55 (1.98) ***	−12.85 (1.28)	−2.07 (1.93)	−29.42 (1.51)	−9.60 (2.28) ***	−31.72 (1.73)	−9.13 (2.61) ***

Abbreviats: BL=Baseline; IV=intravenous; LSM=least squares mean; LSM Diff=least squares mean difference; Miri=mirikizumab; N=number of participants in the analysis population; PBO=placebo; Q4W=every 4 weeks; SC=subcutaneous; SD=standard deviation; SE=standard error.
1The LSM Diff is the least squares mean change from baseline in WPAI:UC scores of participants receiving mirikizumab minus the LSM change from baseline in WPAI:UC scores of participants receiving placebo. *p< 0.05, **p< 0.01, ***p< 0.001.

S750

Patients With High Visceral Adipose Tissue Burden Have a Higher Target Therapeutic Infliximab Concentrations: Should We Be Filling the VAT?

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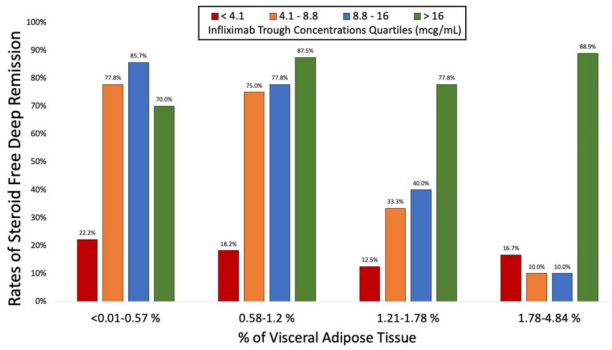
Introduction: In patients with Crohn's disease (CD) or ulcerative colitis (UC), body composition (BC) and specifically visceral adipose tissue (VAT) has been associated with worse response to infliximab (IFX), potentially playing a role in clearance and volume distribution. VAT may also explain heterogenicity in target trough levels of IFX (TLI) associated with favorable outcomes. The aim of this study was to assess whether TLI cutoffs linked to efficacy in patients with CD/UC receiving IFX vary based on VAT.
Methods: We conducted a prospective cross-sectional study including patients with CD or UC receiving maintenance IFX therapy (≥ 22 weeks). Variables collected at enrollment included disease phenotype, inflammation biomarkers (c-reactive protein [CRP] and fecal calprotectin [FCal]), Harvey Bradshaw Index (HBI) and simple endoscopic score (SES-CD) in CD, partial and endoscopic Mayo score (PMS and EMS) in UC. TLI and anti-drug antibodies (ADA) were measured using a drug-tolerant assay. BC parameters were measured using a GE Lunar iDXA scan (body mass, total fat and lean mass, VAT mass). Primary outcome was steroid-free deep remission (SFDR) defined as HBI < 5 in CD and PMS< 2 in UC and a normal CRP and FCal while off corticosteroids. Secondary outcome was endoscopic remission (EMS≤1 in UC or SES-CD≤2) when colonoscopy was done within 12 weeks of index visit. Optimal ITL cutoffs for SFDR by VAT% (VAT/total body mass) were determined using the Youden J statistics (J).
Results: Overall, 142 patients were enrolled and 110 had endoscopic assessment done. Differences between patients by SFDR status are shown in Table. An exposure-response association was identified across all VAT%, with higher ITL thresholds associated with higher VAT% (Figure). The optimal ITL cutoffs associated with SFDR and endoscopic remission were 3.9 mcg/mL (J: 0.52) and 4.9 mcg/mL (J: 0.56) for patients in the lowest two VAT% quartiles (< 1.2%) while optimal ITL cutoffs associated with SFDR and endoscopic remission for those patients in the highest two VAT% quartiles were 15.3 mcg/mL (J: 0.63) and 13.6 mcg/mL (J: 0.57), respectively.
Conclusion: ITL cutoffs associated with favorable outcomes were higher in patients with high VAT%. This suggests that patients with higher VAT burden may require higher ITL vs. those with lower VAT. Clinicians should therefore consider VAT burden when interpreting ITL and performing therapeutic drug monitoring.



[0750] **Figure 1.** Infliximab trough levels associated with treatment efficacy were higher on those patients with a higher visceral adipose tissue burden

Table 1. Differences in study variables between those patients that did and did not achieve steroid-free remission

	Active Disease	Steroid-Free Deep Remission	P value
Female gender [n (%)]	40 (55.6)	39 (55.7)	0.99
Age [mean in years [SD])	43 (17)	39 (17)	0.10
Hispanic ethnicity [n (%)]	3 (4.2)	3 (4.3)	0.97
Race [n (%)]			0.59
Caucasian	64 (90.1)	62 (92.5)	
African-American	5 (7.0)	5 (7.5)	
Asian	1 (1.4)	None	
Other	1 (1.4)	None	
Disease Type [n (%)]			0.47
Crohn's disease	42 (58.3)	45 (64.3)	
Ulcerative colitis	30 (41.7)	25 (25.7)	
Active smoker at baseline [n (%)]	5 (6.9)	9 (12.86)	0.24
Years with IBD [Median in years (IQR)]	2 (1-8)	1 (1-5)	0.10
Crohn's Disease Phenotype			
Location[1] [n (%)]			
L1: Ileal	10 (13.4)	9 (12.9)	0.86

Table 1. (*continued*)

	Active Disease	Steroid-Free Deep Remission	P value
L2: Colonic	7 (9.7)	9 (12.9)	0.56
L3: Ileocolonic	24 (33.3)	26 (37.1)	0.64
L4: Upper Gastrointestinal tract involvement [n (%)]	2 (2.8)	2 (2.9)	0.98
B1: Not stricturing, non-penetrating [n (%)]	16 (22.2)	23 (32.9)	0.16
B2: Stricturing [n (%)]	22 (30.6)	12 (17.1)	0.06
B3: Penetrating [n (%)]	9 (12.5)	9 (12.9)	0.95
Ulcerative Colitis Phenotype			
Ulcerative Colitis Extension[2] [n (%)]			
Proctitis	3 (4.2)	1 (1.4)	0.32
Left-sided Colitis	10 (13.9)	4 (5.7)	0.10
Pan-colitis	17 (23.6)	20 (54.1)	0.50
Total Mass [Mean in Kg (SD)]	84.0 (21.3)	78.0 (19.2)	0.081
Body Mass Index [Mean in Kg/m^2 (SD)]	28.8 (6.3)	26.8 (6.3)	0.07
Percentage of Body Fat [Mean in % (SD)]	48.9 (11.0)	48.0 (10.6)	0.62
Total VAT[3] Mass [Mean in gr (SD)]	1417.8 (1116.0)	893.1 (769.0)	0.0014*
VAT[3] percentage of total body mass [Mean in % (SD)]	1.54 (0.96)	1.04 (0.75)	0.0007*
VAT[3] percentage of total fat mass [Mean in % (SD)]	29.3 (15.3)	20.9 (14.2)	< 0.001*
Percentage of lean mass [Mean in Kg (SD)]	59.3 (9.1)	62.8 (1.3)	0.04*
Lean mass [Mean in Kg (SD)]	48.9 (11.0)	48.0 (10.6)	0.62
Previous Use of Biologic [n (%)]	16 (22.2)	8 (11.4)	0.086
Number of previous biologics[4] [n (%)]			0.45
1	19 (42.2)	17 (39.5)	
2	12 (26.7)	9 (20.9)	
3	9 (20.0)	7 (16.3)	
4	None	1 (2.3)	
5	1 (2.2)	None	
Use 5-aminosalicilates [n (%)]	7 (9.7)	5 (7.1)	0.58
On combination therapy with immunomodulator [n (%)]	30 (41.7)	43 (61.4)	0.019*
Combination therapy with immunomodulator [n (%)]			0.013*
None	42 (58.3)	28 (40.0)	
Methotrexate	6 (8.3)	11 (15.7)	
Azathioprine	23 (31.9)	28 (40.0)	
Mercaptopurine	1 (1.4)	3 (4.3)	
Simple Endoscopic Score-CD[1,5] [Median (IQR)]	8 (4-10)	0 (0-1)	< 0.0001*
Endoscopic Mayo Score[2,5] [n (%)]			0.001*
0	None	7 (38.9)	
1	1 (3.6)	2 (11.1)	
2	14 (50.0)	4 (22.2)	
3	13 (46.4)	5 (27.9)	
SIBDQ[4] [Mean (SD)]	50 (12.4)	53 (12.5)	0.271
Infliximab trough concentration [Median in μg/mL (IQR]	5.7 (2.6-10.7)	14.4 (6.3-20.6)	< 0.0001*
Detectable anti-infliximab antibodies [n (%)]	4 (5.6)	2 (2.7)	0.42

1Only patients with Crohn's disease.
2Only patients with ulcerative colitis
3VAT: Visceral Adipose Tissue Mass.
4Applies to patients with previous exposure to biologic
5Patients with endoscopic assessment
6SIBDQ: Simple Inflammatory Bowel Disease Questionnaire
*Statistically significant.

S751

The Vedolizumab Pregnancy Exposure Registry: An OTIS Pregnancy Study Update

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Introduction: Vedolizumab is a gut-selective immunoglobulin (Ig) G1 monoclonal antibody that binds to α4β7 integrin; it is approved for the treatment of moderately to severely active Crohn's disease (CD) and ulcerative colitis (UC) in the U.S. and elsewhere. Published studies on the effect of vedolizumab in human pregnancy are limited. Data from the ongoing Vedolizumab Pregnancy Exposure Registry (NCT02678052) in the U.S. and Canada have been collected by the MotherToBaby Pregnancy Studies conducted by the Organization of Teratology Information Specialists (OTIS). This prospective observational pregnancy cohort study planned to enroll and analyze the outcomes of 100 vedolizumab-exposed (Vedo) participants compared to 100 disease-matched (DM) and 100 healthy comparison (HC) participants.
Methods: Pregnant women treated with vedolizumab for UC or CD with at least one dose in the first trimester were enrolled in the Vedo group. Pregnant women with UC or CD but no exposure to vedolizumab were enrolled in the DM group. Pregnant women with no exposure to any biologic during pregnancy and not diagnosed with an auto-inflammatory or other exclusionary disease were enrolled in the HC group. Data were collected from telephone interviews and maternal and pediatric medical records; live-born children were followed to one year of age with a dysmorphological examination and developmental screening. The Short Quality of Life in Inflammatory Bowel Disease Questionnaire (SIBDQ) was administered to women with CD or UC.

Results: Between December 2015 and March 2022, outcomes were collected for 301 women, 98 in the Vedo group, 104 in the DM group, and 99 in the HC group. SIBDQ mean scores were similar in the Vedo group, 5.8 (SD 1.0) and the DM group, 5.9 (SD 1.0). Preliminary descriptive outcome data are shown in Table. In the Vedo group 7.3% of pregnancies resulted in a fetus or infant with a major birth defect, compared to 7.8% in the DM group, and 4.7% in the HC group. No pattern of major birth defects was identified in the Vedo group.
Conclusion: The proportion of pregnancies with vedolizumab exposure resulting in a major birth defect are similar to proportions in the disease comparison group, and did not represent a specific pattern. The Vedolizumab Pregnancy Exposure Registry is ongoing with formal statistical analysis planned once the study is completed in 2023.

Table 1. Pregnancy Outcomes in the Study Cohort

	Vedo-Total (N=98)	DM-Total (N=104)	HC-Total (N=99)
Pregnancies ending with live born infant - n/N (%)	93/98 (94.9)	99/104 (95.2)	85/99 (85.9)
Spontaneous abortion – N (Left Truncation Accounted Rate[a])	3 (8.7%)	3 (6.1%)	1 (6.4%)
Termination - n/N (%)	0/98 (0.0)	0/104 (0.0)	0/99 (0.0)
Stillbirth - n/N (%)	0/98 (0.0)	1/104 (1.0)	0/99 (0.0)
Lost to follow-up (LTFU) - n/N (%)	2/98 (2.0)	1/104 (1.0)	13/99 (13.1)
Preterm delivery – N (Rate[b])	13 (14.5%)	6 (6.1%)	6 (7.2%)
Birth weight full term infants – mean g (SD)	3410.4 (436.7)	3428.8 (454.0)	3308.1 (432.3)
Number of pregnancies with major birth defects among all pregnancies excluding LTFU – n/N' (%)	7/96 (7.3)	8/103 (7.8)	4/86 (4.7)
Serious infections in live born infants up to 1 year of age – n/N'(%)[c]	3/97 (3.1)	2/99 (2.0)	1/88 (1.1)
Ages and Stages Screening at 1 year of age with concern – n/N' (%)[c]	10/66 (15.2)	20/87 (23.0)	11/59 (18.6)

[a]Spontaneous abortion rate computed using Fleming-Harrington estimate at 20 weeks' gestation, accounting for left truncation because women can enroll at various times in gestation;
[b]Computed using Fleming-Harrington estimate at 37 weeks' gestation;
[c]Includes twins; % = (n/N') * 100. N' at each category: Number of pregnancies meeting the criteria specified in the row title.

S752

Early Pouchitis Is Associated With an Increased Likelihood of Chronic Antibiotic Dependent Pouchits and Crohn's-Like Disease of the Pouch

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Introduction: Approximately 80% of patients will develop pouchitis at some point after an IPAA for ulcerative colitis (UC), with 17% of patients developing chronic antibiotic dependent pouchitis (CADP) and and 10% developing Crohn's-like disease of the pouch. Few reliable risk factors for these chronic inflammatory conditions of the pouch have been identified. We aimed to investigate the relationship between early pouchitis, defined as acute pouchitis within the first 180 days of the final stage of IPAA surgery, and the future development of CADP and Crohn's-like disease of the pouch.
Methods: We performed a retrospective cohort study, evaluating patients who underwent proctocolectomy with IPAA at our center between January 1, 2004 and December 31, 2016. Multivariable logistic regression was used to evaluate the relationship between early pouchitis and the development of CADP and Crohn's-like disease of the pouch, adjusting for other relevant clinical and demographic factors.
Results: Among 626 patients undergoing IPAA for UC, 137 (22%) developed early pouchitis, 75 (12%) developed CADP, and 59 (9%) developed Crohn's-like disease of the pouch. Patients developing early pouchitis were significantly more likely to be of Hispanic ethnicity compared to patients who did not develop early pouchitis (5.6% vs. 1.4%, p=0.006, Table). Early pouchitis was associated with a significant increase in the odds of developing CADP (adjusted odds ratio [aOR] 3.65, 95% CI 2.19-6.10). A preoperative diagnosis of PSC was also associated with an increase in the odds of developing CADP (aOR 3.97, 95% CI 1.44-11.0). Early pouchitis was also associated with an increased likelihood of developing Crohn's-like disease of the pouch (aOR 2.68, 95% CI 1.50-4.80) as was a family history of inflammatory bowel disease (aOR 2.10, 95% CI 1.11-3.96). The median duration of follow up for all patients in the study was 5.18 years (interquartile range 0.94 – 10.8 years).
Conclusion: In a cohort of patients with UC who underwent IPAA, the development of pouchitis within the first 180 days of surgery was associated with an increased risk of developing CADP and Crohn's-like disease of the pouch. These findings highlight early pouchitis as a unique risk factor for chronic pouch-related disorders and the need for future studies evaluating potential interventions including secondary prophylaxis strategies in this population.

Table 1. Univariate comparison of demographic and clinical characteristics of patients with and without pouchitis in the two years following an ileal pouch-anal anastomosis

	Patients without early pouchitis (n=489)		Patients with early pouchitis (n=137)		p-value
	Median	IQR	Median	IQR	
Age at surgery, in years	40.3	28.8-52.4	43.1	33.7-54.5	0.094
Disease duration prior to surgery	5.9	2.2-14.2	6.3	2.0-13.6	0.854
	n	%	n	%	
Race					0.923
White	424	89.3	121	89.0	
Non-White	51	10.7	15	11.0	
Hispanic	6	1.4	7	5.6	0.006
Family history of Crohn's disease or ulcerative colitis	83	16.2	14	20.0	0.421
Indication for surgery					0.059
Medically-refractory colitis	376	76.9	118	86.1	
Dysplasia or cancer	72	14.7	11	8.0	
Other indications/multiple indications	41	8.4	8	5.8	
Disease extent prior to surgery					0.405
Proctitis	23	5.0	3	2.3	
Left-sided colitis	133	29.1	40	30.8	
Extensive colitis	301	65.9	87	66.9	
Stages involved in IPAA surgery					0.977
1	92	18.9	24	17.5	
2	173	35.5	51	37.2	

Table 1. (*continued*)

	Patients without early pouchitis (n=489)		Patients with early pouchitis (n=137)		p-value
	Median	IQR	Median	IQR	
Modified 2	183	37.5	11	37.2	
3	40	8.2	51	8.0	
Abscess or pelvic sepsis after IPAA surgery	94	19.2	23	16.8	0.518
Evidence of an IPAA leak immediately after IPAA surgery	38	7.8	8	5.8	0.444
Primary Sclerosing Cholangitis	13	2.7	6	4.4	0.299
Medications used prior to colectomy					
Systemic aminosalicylate	380	77.7	115	83.9	0.113
Topical aminosalicylate	230	47.0	72	52.6	0.253
Thiopurine	299	61.2	91	66.4	0.256
Methotrexate	58	11.9	9	6.6	0.077
Anti-TNF	252	51.5	69	50.4	0.809
Vedolizumab	11	2.3	6	4.4	0.175
Cyclosporine	13	2.7	13	9.5	< 0.001
Prednisone use at the time of last stage of surgery	192	39.3	58	42.7	0.487

S753

Mirikizumab Significantly Improves Abdominal Pain in Patients With Moderately-to-Severely Active Ulcerative Colitis: Results From the Phase 3 LUCENT-1 Induction and LUCENT-2 Maintenance Studies

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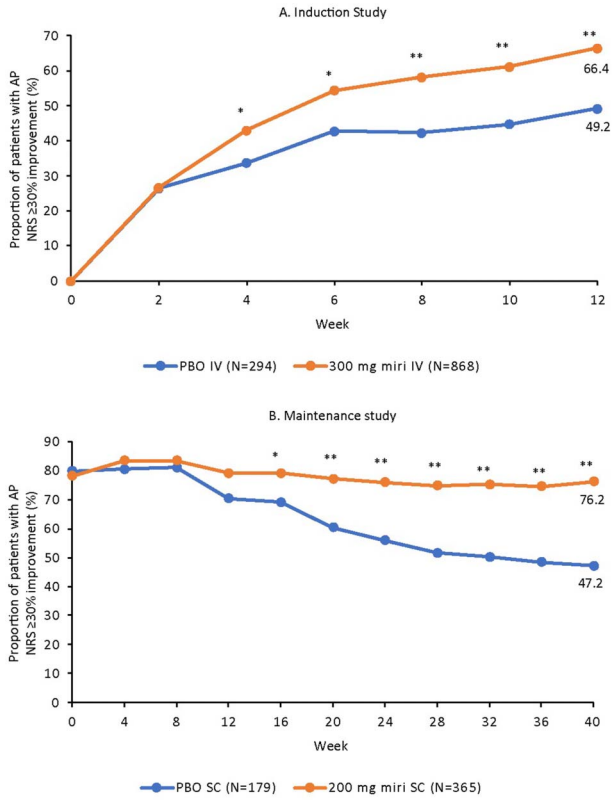
Introduction: Abdominal pain (AP) is a frequent and burdensome symptom in patients (pts) with ulcerative colitis (UC).[1] Mirikizumab (miri; IL-23p19 inhibitor) demonstrated efficacy vs placebo (PBO) in adult pts with moderately-to-severely active UC in randomized, double-blind, phase 3 LUCENT-1 (induction/NCT03518086) and LUCENT-2 (maintenance/NCT03524092) studies.[2,3] Here, we report the effect of miri vs PBO on AP.

Methods: In the induction study, pts (N=1162) were randomized 3:1 to receive intravenous (IV) miri 300 mg or PBO every 4 weeks (Q4W). Pts who achieved clinical response with miri at W12 (N=544) of induction were re-randomized 2:1 to subcutaneous (SC) miri 200 mg or PBO Q4W through W40 in the maintenance study. Pts recorded "worst AP in the past 24 hours" each day using an 11-point AP Numeric Rating Scale (NRS; 0 = no pain; 10 = worst possible pain) on an electronic diary. AP improvement (AP NRS score ≥30% improvement from baseline [BL] in pts with BL AP NRS ≥3) was evaluated. The Cochran-Mantel-Haenszel test was used to compare the proportion of pts achieving AP improvement with missing data imputed as nonresponse.

Results: As early as W4 (miri 43.0% vs PBO 33.7%; risk difference [95% CI]: 9.7 [2.8–16.6], p=0.007) of the induction study, a significant reduction from BL of at least 30% in AP NRS score was observed in the miri-treated pts vs PBO through W12 (66.4% vs 49.2%; 17.4 [10.3–24.6], p< 0.001). In the maintenance study, a greater percentage of miri-treated pts maintained AP NRS improvement compared to PBO. The separation started at W16 (79.2% vs 69.2%; 9.0 [0.5–17.5], p=0.034) and sustained through W40 (76.2% vs 47.2%; 27.4 [18.3–36.4], p< 0.001; Figure).

Conclusion: Miri provided early (W4) and sustained improvement (through W40) of AP compared with PBO in pts with moderately-to-severely active UC.



[0753] **Figure 1.** The proportion of patients with AP NRS ≥30% improvement at A. induction and B. maintenance in patients with Abdominal Pain NRS score ≥3 at induction baseline. *p<0.05; **p<0.001 vs. placebo Weekly measures were calculated by averaging data from daily diary entries of AP NRS for a 7-day period. Baseline value for both induction and maintenance was calculated from daily diary entries the week prior to W0 of induction. Abbreviations: AP NRS, Abdominal Pain Numeric Rating Scale; IV, intravenous; miri, mirikizumab; PBO, placebo; SC, subcutaneous

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S754

Impact of Mirikizumab Treatment on Health-Related Quality of Life in Patients With Crohn's Disease: A Phase 2 Study Analysis Using the SF-36

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Introduction: This analysis evaluated Mirikizumab (miri) effects on Short Form Health Survey (SF-36) in the Phase (Ph)2 randomised, double-blind, parallel, placebo (PBO)-controlled study in patients (pts) with moderately-to-severely active Crohn's disease (CD).

Methods: *12-Week(W) Induction*: 191 pts were randomized 2:1:1:2 to 4 treatment arms: intravenous (IV) PBO, 200, 600, or 1000mg miri every 4 weeks (Q4W; W0, 4, and 8). *40-W Maintenance:* For miri induction dose, pts achieving ≥1-point improvement in Simple Endoscopic Score for CD (SES-CD) at W12 were re-randomized 1:1 to double-blind maintenance treatment from W12 to W48: continuation of induction IV treatment assignment (IV-IV; N=41) or subcutaneous (SC) 300mg miri Q4W (IV-SC; N=46). Due to small sample sizes, maintenance IV arms and SC arms were pooled. W12 SES-CD non-improvers (N=30) and pts receiving PBO during induction (N=59) received IV 1000mg miri Q4W from W12 to W48. No statistical comparisons were made between miri treatment groups in the maintenance period. SF-36 was assessed at baseline and at W4,12,16, 24, 32, 44, and 52.

Results: Statistically significant improvement in MCS was observed at W4 (600mg dose level) and at W12 (all dose levels), whereas statistically significant improvements in PCS were observed only at W12 (600 and 1000mg dose levels) compared to PBO (Table). Though statistical comparisons were not made between treatment groups during maintenance, comparison of mean changes in MCS and PCS suggest that improvements during induction were sustained or further numerically increased with miri maintenance treatment, even in induction SES-CD non-improvers (Table).

Conclusion: These data show that miri treatment improves health related quality of life in pts with moderately to severely active CD and suggest an earlier impact on mental compared to physical wellbeing. Maintenance treatment effects were numerically consistent or increased compared to induction effects, even among more refractory pts. These findings will be validated in the ongoing miri Ph3 CD study (NCT03926130). Proinflammatory signals can induce anxiety and depressive symptoms; better understanding of how the effects of anti-inflammatory treatment on the gut-brain axis may improve mental and physical subjective wellbeing requires additional mechanistic studies.

Table 1. Effect of mirikizumab on SF-36 MCS and PCS Change from Baseline

	Mental Component Score (MCS)				Physical Component Score (PCS)			
Induction Period	PBO (N=64)	200 mg IV miri (N=31)	600 mg IV miri (N=32)	1000 mg IV miri (N=64)	PBO (N=64)	200 mg IV miri (N=31)	600 mg IV miri (N=32)	1000 mg IV miri (N=64)
W0 Baseline (Mean ± SD)	37.0 ± 13.2	35.2 ± 10.2	41.1 ± 10.4	40.4 ± 11.6	38.9 ± 8.3	38.4 ± 6.4	42.9 ± 7.8	39.5 ± 8.6

Table 1. (*continued*)

	Mental Component Score (MCS)				Physical Component Score (PCS)			
W4 CFBL (LSM ± SE)	1.9 ± 1.0	2.6 ± 1.4	**5.2 ± 1.4***	3.1 ± 1.0	2.4 ± 0.7	3.3 ± 1.0	3.4 ± 1.0	4.2 ± 0.7
W12 CFBL (LSM ± SE)	2.3 ± 1.1	**7.5 ± 1.6***	**6.5 ± 1.6***	**6.1 ± 1.2***	3.1 ± 0.8	4.7 ± 1.1	**8.0 ± 1.1****	**6.7 ± 0.8****
Maintenance Period	PBO-1000 mg IV miri (N=59)	NI-1000 mg IV miri (N=30)	All IV-IV miri (N=41)	All IV-SC miri (N=46)	PBO-1000 mg IV miri (N=59)	NI-1000 mg IV miri (N=30)	All IV-IV miri (N=41)	All IV-SC miri (N=46)
W0 Baseline (Mean ± SD)	37.2 ±13.0	38.0 ±11.2	42.0 ± 10.1	38.7 ±10.7	39.5 ± 8.1	40.8 ± 8.3	41.1 ± 8.5	38.1 ± 7.1
W24 CFBL (Mean ± SD)	7.4 ± 8.7	7.7 ± 11.7	7.0 ± 10.6	5.9 ± 13.1	6.8 ± 7.3	7.1 ± 7.8	9.6 ± 5.6	7.1 ± 8.3
W52 CFBL (Mean ± SD)	7.1 ± 10.6	7.3 ± 9.8	8.5 ± 11.3	11.5 ± 11.4	9.9 ± 7.2	7.1 ± 8.2	10.2 ± 8.7	10.7 ± 7.9

Abbreviations: CFBL = change from baseline; IV = intravenous; IV-IV = pooled maintenance IV treatment arms for patients at each miri induction dose level who achieved ≥1-point improvement in SES-CD at W12 who were re-randomized to continued induction IV treatment assignment during maintenance; IV-SC = pooled maintenance SC treatment arms for patients at each miri induction dose level who achieved ≥1-point improvement in SES-CD at W12 who were re-randomized to SC 300mg miri Q4W during maintenance; LSM = least squares mean; NI = SES-CD non-improver (a patient who received miri during induction who did not achieve a ≥1-point improvement in SES-CD at W12); PBO = placebo; SC = subcutaneous; SD = standard deviation; SE = standard error; W = week. For statistical comparisons across induction treatment groups, a mixed model for repeated measures was used. The model includes treatment, region, prior biologic CD therapy used, baseline, visit and baseline by visit, and treatment by visit.
p-values versus PBO: *p< 0.05; ** p≤0.001. Bolded values are statistically different versus PBO.

S755

Early Symptom Control With Mirikizumab in Patients With Moderately to Severely Active Ulcerative Colitis in the LUCENT-1 Induction Trial

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Introduction: Mirikizumab (miri), an anti-IL23/p19 monoclonal antibody, demonstrated efficacy compared with placebo (PBO) in the Phase 3, multicentre, randomized, double-blind LUCENT-1 induction study in patients with moderately to severely active ulcerative colitis (UC, NCT03518086)). This analysis assessed early onset of symptomatic improvement and symptomatic control during induction.
Methods: During the 12-week (W) induction study, 1162 adult patients (pts) with inadequate response, loss of response, or were intolerant to conventional therapy or biologic or tofacitinib therapy for UC, received miri IV Q4W (N=868) or PBO (N=294). We evaluated improvement for symptoms of stool frequency (SF), rectal bleeding (RB) and bowel movement urgency (BU), abdominal pain and fatigue. BU Numeric Rating Scale (NRS) change from baseline (BL), BU Clinical Meaningful Improvement (CMI), BU Remission, Fatigue NRS change from BL, Abdominal Pain Improvement, as well as SF Remission, RB Remission, Symptomatic Response and Symptomatic Remission were assessed.
Results: As early as W2, miri-treated pts achieved a significantly greater reduction in RB subscores (p=0.001) and in SF subscores (p=0.035). From W2 and W4, a significantly greater percentage achieved SF Remission and RB Remission, respectively compared to PBO. A significantly greater percentage of miri-treated pts achieved Symptomatic Response compared to PBO from W2 (p=0.003) and of Symptomatic Remission compared with PBO from W4 (p< 0.001). Miri-treated pts showed a significantly greater mean reduction in BU NRS scores as early as W2 compared to PBO (p=0.004). From W4, a significantly greater percentage of miri-treated pts achieved BU CMI versus PBO (p=0.044). From W7 onwards, a significantly greater percentage achieved BU Remission (p=0.002). The pts showed a significantly greater mean reduction in Fatigue NRS scores from W2 compared to PBO (p=0.014). As early as W4, a significant reduction of at least 30% in Abdominal Pain NRS score from BL was observed in the miri-treated pts compared with PBO (p=0.007). At W12, a significantly greater proportion of miri-treated pts achieved Symptomatic Response, Symptomatic Remission, RB Remission, SF Remission, BU change from BL, BU CMI and Remission, as well as Fatigue and Abdominal Pain Improvement, compared to PBO (Table).
Conclusion: Miri provides rapid control of UC symptoms, including BU and fatigue, as early as W2 compared with PBO in pts with moderately to severely active UC.

Table 1. **Assessment of improvement for UC symptomatic components in patients treated with miri vs PBO at W12**

Endpoint (W12)	PBO IV Q4W N=294	Miri 300 mg IV Q4W N=868	Risk difference vs PBO (95% CI) *	P-value
RB Remission[a], n (%)	129 (43.9)	555 (63.9)	20.6 (14.2, 27.0)	< 0.001
SF Remission[b], n (%)	117 (39.8)	495 (57.0)	17.1 (10.7, 23.6)	< 0.001
Symptomatic Response[c], n (%)	154 (52.4)	625 (72.0)	20.2 (13.8, 26.6)	< 0.001
Symptomatic Remission[d], n (%)	82 (27.9)	395 (45.5)	17.5 (11.4, 23.6)	< 0.001
BU Clinical Meaningful Improvement[e], n (%)	N=276** 89 (32.2)	N=811** 395 (48.7)	16.2 (9.7, 22.7)	< 0.001
BU Remission[f], n (%)	N=276** 34 (12.3)	N=811** 179 (22.1)	9.7 (4.9, 14.5)	< 0.001
BU NRS, LSM change from baseline (SE)	-1.63 (0.14)	-2.59 (0.08)	-0.95 (-1.47, -0.44)	< 0.001
Fatigue NRS, LSM change from baseline (SE)	-1.29 (0.13)	-1.96 (0.08)	-0.66 (-0.96, -0.37)	< 0.001
Abdominal Pain NRS ≥30% reduction[g], n (%)	N=246** 121 (49.2)	N=711** 472 (66.4)	17.4 (10.3, 24.6)	< 0.001

*The Cochran-Mantel-Haenszel (CMH) test, with missing data imputed as nonresponse, was used to assess the outcomes. Mixed Model for Repeated Measures was used to assess BU NRS. *The risk difference and CMH test were both adjusted for the stratification factors of prior biologic or tofacitinib failure, baseline corticosteroid use, region, and baseline modified mayo score.*
**Baseline population differs according to definition of each endpoint.
[a]RB subscore of 0.
[b]SF subscore 0, or 1 with ≥1-point decrease from BL.
[c]At least a 30% decrease from BL in the sum of SF and RB subscores.
[d]SF subscore 0, or 1 with ≥1-point decrease from BL, and RB subscore of 0.
[e]BU NRS improvement of ≥3 points pts with BL BU NRS ≥3.
[f]NRS 0 or 1 in pts with BL BU NRS ≥3.
[g]NRS pain score ≥30% improvement from baseline in patients with baseline AP NRS ≥3.
Abbreviations: PBO= placebo; miri= mirikizumab; Q4W= every 4 weeks; CI= confidence interval; n= number of patients in the specified category, RB= rectal bleeding; LSM = least square mean; SE= standard error; SF= stool frequency; BU= bowel movement urgency; NRS = numeric rating scale.

S756

Excess Non-COVID Mortality Among IBD Decedents During the COVID-19 Pandemic

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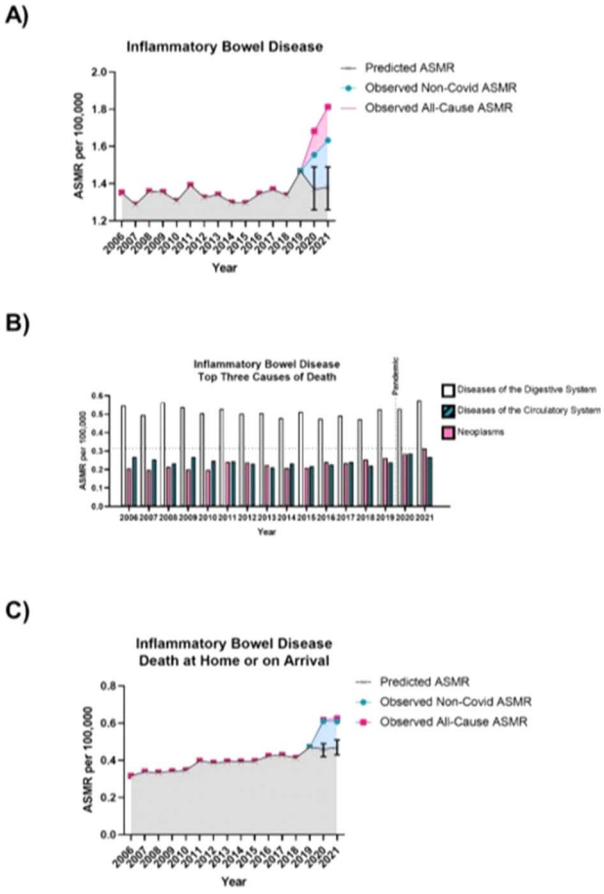
Introduction: The degree to which the pandemic has caused excess non-COVID death in IBD patients remains unclear.

Methods: This serial population-based analysis included data from the CDC's National Vital Statistics System on IBD decedents aged ≥25 years from 1/1/06 to 12/31/21. IBD was defined as Crohn's disease (CD) or ulcerative colitis (UC). Decedents were stratified by age (25-64 vs ≥65 years), sex, race (Hispanic, non-Hispanic white, and non-Hispanic black), place of death (at home/on arrival, at a medical facility, on hospice, or in a nursing facility), and top three causes of death (diseases of the digestive system, circulatory system, or neoplasms). Age-standardized mortality rates (ASMRs) per 100,000 persons were calculated for all-cause, non-COVID, and COVID mortality. Predictive analyses were performed to predict ASMRs during the pandemic based on pre-pandemic data. Observed ASMR higher than the 95% confidence intervals of predicted ASMR was considered as statistically significant.

Results: Of 30,328 IBD-related deaths from 2006-2021, 5,270 occurred from 2020-2021. 417 (7.9%) were COVID-related, and 4,853 (92.1%) were non-COVID-related. There was significant excess non-COVID death among IBD patients in 2020 (ASMR 1.55 vs 1.37, 95% CI [1.26-1.49]) and 2021 (1.63 vs 1.38, 95% CI [1.26-1.49]) (**Figure A**). In subgroup analyses (**Table**), UC patients aged 25-64 years and non-Hispanic black patients with CD had significant excess non-COVID death in 2020 (0.20 vs 0.17, 95% CI [0.15-0.19]; (0.75 vs 0.55, 95% CI 0.41-0.70). Death from neoplasms was significantly increased during the pandemic (0.30 vs 0.22, p=0.0167) (**Figure B**). Additionally, there were significant excess non-COVID deaths among IBD decedents at home and on arrival during the pandemic (2020: 0.61 vs 0.46, 95% CI [0.42-0.49]; 2021: 0.61 vs 0.47, 95% CI [0.43-0.51]) (**Figure C**). Deaths at medical facilities were also increased (2021: 0.59 vs 0.48, 95% CI [0.39-0.56]), while deaths on hospice decreased (2021: 0.14 vs 0.17, 95% CI [0.15-0.18]) (**Table**).

Conclusion: IBD patients experienced significant excess non-COVID mortality during the pandemic. Upon subgroup stratification, young UC patients and non-Hispanic black CD patients were the most impacted. The rise in neoplasm-related non-COVID deaths and mortality rates prior to hospital arrival during the pandemic suggests that indirect effects of the pandemic, such as delayed presentation, likely exacerbated healthcare disparities and adversely impacted timely interventions and care.



[0756] **Figure 1.** Temporal Trends of Observed All-Cause, Non-COVID, and Predicted Age-Standardized Mortality Rates Among IBD Decedents Temporal trends in ASMR per 100,000 persons are shown among (A) all IBD decedents, (B) top 3 causes of death, and (C) deaths at home or on arrival. 95% confidence intervals are represented by error bars. ASMR=Age-Standardized Mortality Rate. COVID=coronavirus disease. IBD=inflammatory bowel disease.

Table 1. Subgroup Analyses of Observed COVID, Non-COVID, and Predicted Age-Standardized Mortality Rates Among IBD Decedents

Stratification Group			Year	COVID ASMRs	Non-COVID ASMRs	Predicted ASMRs with 95% CI
Age	UC	25-64 years	2020	0.01	0.20*	0.17 [0.15-0.19]
			2021	0.03	0.18	0.17 [0.15-0.19]
		≥65 years	2020	0.28	2.31	2.30 [2.01-2.58]
			2021	0.28	2.53	2.45 [2.04-2.86]
	CD	25-64 years	2020	0.02	0.46	0.42 [0.37-0.47]
			2021	0.04	0.46	0.45 [0.38-0.52]
		≥65 years	2020	0.25	2.95	2.79 [2.46-3.12]
			2021	0.33	3.15	2.87 [2.49-3.25]

Table 1. (*continued*)

Stratification Group			Year	COVID ASMRs	Non-COVID ASMRs	Predicted ASMRs with 95% CI
Sex	UC	Male	2020	0.07	0.70	0.68 [0.62-0.75]
			2021	0.09	0.69	0.70 [0.63-0.78]
		Females	2020	0.06	0.54	0.53 [0.44-0.61]
			2021	0.07	0.60	0.57 [0.44-0.70]
	CD	Males	2020	0.06	0.94	0.93 [0.83-1.04]
			2021	0.11	0.99	1.01 [0.86-1.16]
		Females	2020	0.06	0.95	0.90 [0.78-1.02]
			2021	0.09	0.99	0.94 [0.76-1.12]
Race	UC	Hispanics	2020	0.04	0.26	0.23 [0.07-0.38]
		Non-Hispanic whites	2020	0.07	0.71	0.71 [0.63-0.78]
		Non-Hispanic blacks	2020	0.02	0.39	0.41 [0.29-0.52]
	CD	Hispanics	2020	0.03	0.27	0.27 [0.08-0.47]
		Non-Hispanic whites	2020	0.07	1.15	1.12 [0.99-1.25]
		Non-Hispanic blacks	2020	0.06	0.75*	0.55 [0.41-0.70]

*Signifies statistical significance ASMRs are per 100,000 persons.
ASMR=Age-Standardized Mortality Rate. CD=Crohn's Disease. CI=confidence interval. COVID=coronavirus disease. UC=Ulcerative Colitis.

S757

Efficacy and Safety of 2 Years of Continuous Ozanimod Treatment: Interim Analysis of the True North Open-Label Extension Study

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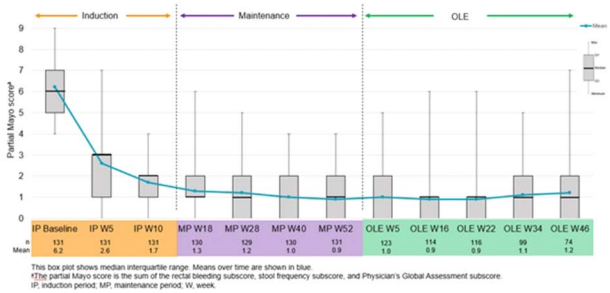
Introduction: The phase 3 True North (TN) study demonstrated the efficacy and safety of oral ozanimod (OZA) 0.92 mg once daily (equivalent to OZA HCl 1 mg) in patients (pts) with moderately to severely active ulcerative colitis (UC). The ongoing TN open-label extension (OLE) study is exploring longer-term efficacy and safety of OZA in UC. This interim analysis of the TN OLE evaluated the efficacy and safety of OZA in pts who received 98 weeks of continuous OZA treatment.
Methods: Pts in clinical response (CRS) after 52 weeks of continuous OZA during TN who rolled over into the OLE were included (data cutoff: September 30, 2020). Nearly 73% of pts had completed OLE Week 46 (Week 98 of continuous OZA therapy) at the time of data cutoff when outcomes were measured. Endoscopy was performed annually throughout the OLE and was scored by Mayo endoscopic score. Efficacy data (Clinical Remission [CRM], CRS, Endoscopic Improvement [EI], and Corticosteroid-Free Remission [CFR]) were analyzed using observed cases (OC) and nonresponder imputation (NRI). Safety data were also recorded.
Results: Of 131 total pts in CRS at TN Week 52, 83 (63%) were in CRM and 48 (37%) were in CRS only (but not CRM) on entry to the OLE. Demographic and clinical characteristics at TN baseline were similar for pts in both subgroups, except that a higher proportion of pts with only CRS at OLE entry were exposed to prior immunomodulators or tumor necrosis factor inhibitors at TN baseline. A high proportion of the overall population sustained CRM, CRS, EI, and CFR on OZA at OLE Week 46 in both OC and NRI analyses, with higher rates of CRM, EI, and CFR among pts entering the OLE in CRM (Table). Notably, 97% of all pts sustained CRS through overall Week 98 in OC analysis (64% in NRI analysis). Of the pts in CRS only at OLE entry, 55% achieved CRM by OLE Week 46 in OC analysis (NRI: 32%). Mean partial Mayo score over time for the overall population is shown in the Figure. No new safety findings emerged from this extended analysis; 1 sudden death occurred during the OLE and was adjudicated to be unrelated to OZA.
Conclusion: This interim analysis of the TN OLE found that pts who achieved CRS or CRM after 1 year of OZA had a high rate of sustaining CRS, CRM, and EI for another year. Pts who after a year of OZA were in CRS could achieve CRM with continued OZA therapy. No additional safety signals were observed.



[0757] **Figure 1.** Mean partial Mayo scores of OZA over time in the overall population of pts in CRS at TN Week 52

Table 1. **OZA efficacy at OLE Week 46 (overall Week 98) in pts entering OLE in CRS (OC and NRI data)**

Clinical endpoints at OLE Week 46, % (n/N)	Overall population at TN Week 52 (n=131)		Pt subgroup in CRM[a] at TN Week 52 (n=83)		Pt subgroup in CRS[b] only at TN Week 52 (n=48)	
	OC[c]	NRI[d]	OC[c]	NRI[d]	OC[c]	NRI[d]
Clinical Remission	67 (42/63)	44 (42/95)	73 (30/41)	53 (30/57)	55 (12/22)	32 (12/38)
Clinical Response	97 (61/63)	64 (61/95)	98 (40/41)	70 (40/57)	95 (21/22)	55 (21/38)
Endoscopic Improvement[e]	74 (55/74)	58 (55/95)	82 (41/50)	72 (41/57)	58 (14/24)	37 (14/38)
Corticosteroid-Free Remission[f]	63 (40/63)	42 (40/95)	71 (29/41)	51 (29/57)	50 (11/22)	29 (11/38)

[a]CRM was defined as RBS = 0 and SFS ≤1 point (and a decrease of ≥1 point from the baseline SFS) and mucosal endoscopy subscore ≤1 without friability.
[b]CRS was defined as reduction of 3-component Mayo score of ≥2 points and at least 35%, and reduction in RBS of ≤1 point or an absolute RBS of ≤1.
[c]Denominators for OC were based on the number of pts who completed Week 46.
[d]Denominators for NRI were based on the number of pts who completed Week 46 of the OLE and those who withdrew before Week 46 but would have reached Week 46 if they had stayed. This did not include the number of pts in the OLE who have not yet completed Week 46 or who discontinued and would not have reached Week 46 by this data cutoff.
[e]Endoscopy subscore of ≤1 point.
[f]Clinical remission while off corticosteroids for ≥12 weeks.
CRM, clinical remission; CRS, clinical response; CRS only, clinical response but not remission; RBS, rectal bleeding subscore; SFS, stool frequency subscore.

S758

Infliximab Clearance and Exposure Are Comparable Between Originator Remicade and Biosimilars in Clinical Gastroenterology Practice

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Introduction: Clearance is the key pharmacokinetic (PK) property of Infliximab (IFX) elimination from the body as a function of time (expressed as L/day) and is a poor prognostic factor associated with immunogenicity, suboptimal exposure and inadequate disease control. Our objective was to compare IFX PK (as clearance) between Originator IFX and Biosimilars.
Methods: De-identified data were extracted from a large commercial database of clinical PK data (Prometheus Laboratories) submitted for Originator (IFX, REMICADE®) or Biosimilars (RENFLEXIS®, IFX-abda and INFLECTRA®, IFX-dyyb) testing. Originator and Biosimilar testing were calibrated against WHO standard (NIBSC code: 16/170) with less than 3% difference in reported levels. Intra-day and inter-day coefficient of variation were below 5% and 10%, respectively. IFX levels, Antibody to IFX (ATI) status (>3.1 U/mL), dosing and time of specimen collection relative to infusion were analyzed using nonlinear mixed effect models to estimate Clearance. Statistical analysis consisted of Fisher's exact and Mann-Whitney tests as appropriate.
Results: A total of 9,590 specimens from 7,551 patients (mean age 36 years, 48% female) who received a 5 or 10 mg/Kg q8 weeks dosing schedule were available for this analysis (714 bioequivalent specimens, 66.1% IFX-dyyb and 8,876 Originator). Overall, the PK were comparable between Originator and Biosimilars, although a small trend toward higher Clearance was observed in patients who received Biosimilars as compared to those who received Originator IFX (0.277±0.004 vs 0.262±0.001 L/day, respectively) (p< 0.001). Higher ATI's were observed with Biosimilars vs Originator (19% [136/714] vs 15% [1320/8876], respectively) (p< 0.001) as well as lower exposure (7.6±0.3 vs 8.5±0.1 μg/mL, respectively) (p< 0.001). These differences were significant only among those who received a 5 mg/Kg q8 weeks schedule. Clearance was 2-fold higher in the presence of ATI and resulted in 6-fold lower exposure for Originator (mean=1.5 vs 9.2 μg/mL) and Biosimilar (mean=1.5 vs 9.7 μg/mL) (p< 0.001).
Conclusion: These data suggest that Originator and Biosimilars yield comparable exposure. The small detectable higher immunogenicity rate observed in the group of patients receiving Biosimilars could reflect longer duration of IFX treatment among those who switched from Originator to Biosimilar. (Table)

Table 1. Clearance (L/day) and IFX levels (μg/mL) by ATI status and IFX dosing schedules

	5mg/Kg q8 weeks	10 mg/Kg q8 weeks	Overall
Clearance (L/day)			
ATI negative	O: 0.223±0.001 (n=5,076) B: 0.232±0.004 (n=399) **Fold: 1.04**; p=0.059	O: 0.251±0.001 (n=2,480) B: 0.257±0.005 (n=179) **Fold: 1.02**; p=0.176	O: 0.232±0.001 (n=7556) B: 0.239±0.003 (n=578) **Fold: 1.03**; p=0.033
ATI positive	O: 0.432±0.003 (n=1,015) B: 0.439±0.009 (n=115) **Fold: 1.02**; p=0.196	O: 0.443±0.006 (n=305) B: 0.428±0.028 (n=21) **Fold: 1.01**; p=0.712	O: 0.434±0.003 (n=1320) B: 0.437±0.009 (n=136) **Fold: 1.01**; p=0.487
Overall	O: 0.258±0.110 (n=6,091) B: 0.278±0.120 (n=514) **Fold: 1.08**; p< 0.01	O: 0.272±0.097 (n=2785) B: 0.275±0.094 (n=200) **Fold: 1.01**; p=0.375	O: 0.262±0.001 (n=8876) B: 0.277±0.004 (n=714) **Fold: 1.06**; p< 0.001
IFX (μg/mL)			
ATI negative	O: 8.7±0.1 (n=5,076) B: 8.3±0.4 (n=399).95 **Fold: 0.95**; p=0.538	O: 11.6±0.2 (n=2,480) B: 10.7±0.6 (n=179) **Fold: 0.92**; p=0.272	O: 9.7±0.1 (n=7556) B: 9.2±0.3 (n=578) **Fold: 0.95**; p=0.024
ATI positive	O: 1.3±0.1 (n=1,015) B: 1.2±0.2 (n=115) **Fold: 0.92**; p=0.994	O: 2.3±0.2 (n=305) B: 3.2±1.0 (n=21) **Fold: 1.4**; p=0.626	O: 1.5±0.1 (n=1320) B: 1.5±0.3 (n=136) **Fold: 1.00**; p=0.818
Overall	O: 7.5±0.1 (n=6,091) B: 6.7±0.3 (n=514) **Fold: 0.89**; p< 0.01	O: 10.6±0.2 (n=2785) B: 9.9±0.6 (n=200) **Fold: 0.93**; p=0.547	O: 8.5±0.1 (n=8876) B: 7.6±0.3 (n=714) **Fold: 0.89**; p< 0.001

O: Originator; B: Biosimilar. Results are expressed as Mean (SEM) with fold difference between B and O.

S759

Model-Predicted Lymphocyte Response and Recovery Profiles for the Sphingosine 1-Phosphate Receptor Modulators Ozanimod and Etrasimod

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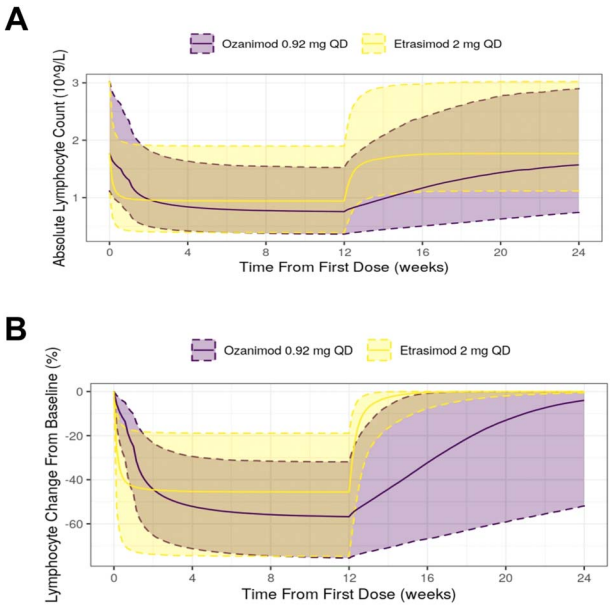
Introduction: Sphingosine 1-phosphate (S1P) receptor modulators, including ozanimod (OZA) and etrasimod (ETR), reversibly sequester lymphocyte egress from lymph nodes, thereby reducing the number of peripheral circulating lymphocytes and their subsequent recruitment to sites of inflammation. Exposure-response models describing observed/published pharmacokinetic (PK) and pharmacodynamic (PD) data can be useful tools for multiple purposes including facilitating comparisons between compounds. Here we present model-predicted lymphocyte response profiles for once-daily dosing of OZA and ETR as well as lymphocyte recovery profiles following drug discontinuation.
Methods: A population PK/PD model of lymphocyte response to OZA over time was developed from published summary-level data for CC112273 PK profile and an OZA lymphocyte E_{max} model. Initial model simulation predicted a mean baseline lymphocyte count of $1.97x10^9$/L (slightly higher than the observed mean baseline in the OZA RADIANCE study [$1.83x10^9$/L]); thus, a correction factor of 0.93 was applied to subsequent OZA simulations. A population PK/PD model of lymphocyte response to ETR over time was developed using data from 7 Phase 1 studies in healthy volunteers and 2 Phase 2 studies in participants with either ulcerative colitis or atopic dermatitis. Simulations from both models of 10,000 virtual participants given OZA (initial 7-day dose titration: 0.23mg on Days 1–4, 0.46mg on Days 5–7, 0.92mg on Day 8 and thereafter for 11 weeks) or ETR (2mg for 12 weeks) were produced and compared.
Results: Model-predicted lymphocyte response over time approximately (≥90%) reached median steady-state lymphocyte nadir within 24 days for OZA vs within 5 days for ETR (Figure). After drug discontinuation, the predicted time for lymphocyte counts to return to the lower end of the normal range (of either $0.8x10^9$/L or $1.0x10^9$/L for 90% of virtual participants) was 48 and 81 days, respectively, for OZA and 2 and 4 days, respectively, for ETR. The model predicted results for OZA appear generally consistent with similar observed lymphocyte findings reported in its drug label.
Conclusion: Model predictions of lymphocyte response and recovery profiles indicate that ETR, when compared to OZA, is expected to achieve lymphocyte nadir more quickly as well as require less time to recover to the normal range after drug discontinuation.



[0759] **Figure 1.** Absolute Lymphocyte Count (A) and Percent Change From Baseline (B) vs Time Profiles for Ozanimod and Etrasimod

S760

Epidemiology of Glomerulonephritis as an Extraintestinal Manifestation of Inflammatory Bowel Disease: A Large Population-Based Study

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Introduction: Inflammatory bowel disease (IBD), including both Crohn's disease (CD) and Ulcerative colitis (UC), are known to cause many extraintestinal manifestations. There is limited data describing the association between IBD and renal manifestations. This study provides epidemiologic data to further understand the association between IBD and glomerulonephritis (GN).
Methods: The aim of this study was to investigate if IBD is associated with GN. Data was collected from a commercial database (Explorys Inc, Cleveland, OH), an aggregate of EHR data from 27 integrated healthcare systems in the US between 1/2017-1/2022. We identified patients with CD and UC based on Systemized Nomenclature of Medicine – Clinical Terms. We compared the prevalence of GN at least 30 days post-CD or post-UC diagnosis to a control cohort without CD or UC. We excluded patients with a diagnostic predisposition for development of GN (Table).
Results: Of the 34,063,760 patients, we identified 149,630 cases of CD and 127,300 cases of UC. There were 310 and 260 cases of glomerulonephritis at least 30 days after diagnosis of CD and UC, respectively. Overall prevalence of glomerulonephritis for CD and UC was 207/100000 persons and 203/100000 persons, whereas for the cohort without CD and UC was 72/100000 persons and 72/100000 persons. Prevalence ratios (PR) of developing glomerulonephritis after at least 30 days of a CD and UC diagnosis were 2.88 (95% CI, 2.57-3.22, p< 0.001) and 2.83 (95% CI, 2.51-3.20, p< 0.001), respectively. Figure shows prevalence and PR in CD and UC sub-categorized by demographics. Membranous GN was the most prevalent (CD 90, UC 90), followed by proliferative (CD 50, UC 50), mesangiocapillary (CD 30, UC20), diffuse (CD 10, UC 0) and focal membranoproliferative (CD 10, UC 10).
Conclusion: In this large population-based study, glomerulonephritis was significantly more prevalent in patients with both CD and UC compared to those without IBD. Further studies are needed to understand the pathophysiological mechanism underlying renal involvement.

	CD	Prevalence per 100000	No CD	Prevalence per 100000	Prevalence Ratio	95% CI	p-value
Glomerulonephritis	310	207.18	24420	72.01	2.88	2.57-3.22	<0.001
Adults (18-65)	180	171.61	13560	67.83	2.53	2.18-2.93	<0.001
Elderly (65+)	120	280.57	10400	131.20	2.14	1.79-2.56	<0.001
Caucasian	230	203.77	16260	88.32	2.31	2.03-2.63	<0.001
African American	60	451.47	5750	148.79	3.03	2.35-3.91	<0.001
Asian	0	0.00	500	92.62	0	0	0.095
Male	120	205.94	12370	82.23	2.51	2.09-3.00	<0.001
Female	190	209.34	11990	64.37	3.25	2.82-3.75	<0.001

	UC	Prevalence per 100000	No UC	Prevalence per 100000	Prevalence Ratio	95% CI	p-value
Glomerulonephritis	260	204.24	24470	72.11	2.83	2.51-3.20	<0.001
Adults (18-65)	140	173.14	13600	67.95	2.55	2.16-3.01	<0.001
Elderly (65+)	120	260.98	10400	131.26	1.99	1.66-2.38	<0.001
Caucasian	210	213.44	16280	88.36	2.42	2.11-2.77	<0.001
African American	40	416.23	5760	148.90	2.80	2.05-3.81	<0.001
Asian	0	0	500	92.61	0	0	0.100
Male	120	236.69	12380	82.25	2.88	2.41-3.44	<0.001
Female	140	183.73	12040	64.59	2.85	2.41-3.36	<0.001

[0760] **Figure 1.** Prevalence and prevalence ratios of glomerulonephritis after at least 30 days post-CD and post-UC diagnosis.

Table 1. Diagnoses excluded prior to analysis

Excluded diagnoses
Systemic lupus erythematosus
Goodpasture's syndrome
Hereditary nephritis
Post-infectious GN
Granulomatosis with polyangiitis
Allergic grandulomatosis angiitis
Alport syndrome
Human immunodeficiency virus

Table 1. (*continued*)

Excluded diagnoses
Hepatitic B virus
Hepatitis C virus
Nephrotic syndrome with membranoproliferative glomerulonephritis
Primary pauci-immune necrotizing and crescentic glomerulonephritis
Berger's immunoglobulin A or immunoglobulin G nephropathy

S761

Association Between Absolute Lymphocyte Count and Ozanimod Efficacy/Safety in Patients With Moderate/Severe Ulcerative Colitis: Results From the Phase 3 True North Study

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Introduction: Ozanimod (OZA) is approved in the USA and EU for treatment (tx) of moderate/severe UC. OZA binding internalizes $S1P_1$ receptors, reducing egress of lymphocyte subsets into circulation. OZA was approved in this patient (pt) population based on results of the phase 3 True North (TN) study (NCT02435992).
Methods: We evaluated association between absolute lymphocyte count (ALC) and OZA efficacy/safety during TN's induction period (IP) and maintenance period (MP). Pts were randomized to double-blind (DB) OZA 0.92 mg or placebo (PBO) or open-label (OL) OZA during 10-week (W) IP. Pts with clinical response to OZA at W10 were rerandomized to DB OZA or PBO for MP through W52. Rectal bleeding (RB), stool frequency (SF), composite Mayo, Physician's Global Assessment (PGA), and endoscopy scores were assessed at baseline and as clinical outcomes at W10 and W52. Efficacy endpoints (EPs; clinical remission, clinical response, endoscopic improvement, mucosal healing, and histologic remission) were assessed at W10 and W52. Tx-emergent adverse events (TEAEs) and ALC were evaluated at baseline and W5, W10, W18, W28, W40, and W52.
Results: During IP, 645 pts received DB OZA (n=429) or PBO (n=216) and 367 received OL OZA; for MP, 230 and 227 OZA-treated pts were rerandomized to OZA and PBO, respectively. Baseline ALC was not significantly correlated with clinical outcome at W10 or W52 as measured by changes from baseline RB, SF, Mayo, PGA, and endoscopy scores in pts on OZA or PBO. Baseline ALC was not predictive or prognostic for W10 and W52 responses based on the efficacy EPs. Reductions from baseline in mean ALC occurred by W5 with OZA and were significantly greater with OZA (53-54%) vs PBO (2.3%; $P< .001$). ALC plateaued by W10 and was maintained through W52 in pts on continuous OZA. ALC returned to PBO levels by W52 in pts who switched to PBO during MP. Change in ALC at W10 was generally not significantly correlated with changes in clinical outcomes at W10 or W52. Change in ALC at W5 was not predictive of W10 response; change in ALC at W10 was not predictive of W52 response. Reductions from baseline in ALC at all weeks were similar in OZA-treated pts with/without ≥1 TEAE and with/without infection TEAEs.
Conclusion: ALC reductions occurring with OZA were reversed upon tx discontinuation and were not associated with TEAEs. Baseline ALC and ALC reductions were not predictive or prognostic for response. These findings support ALC as a pharmacodynamic biomarker but not as a prognostic or predictive biomarker.

S762

Evaluation of Clinical Variables, Radiological Visual Analog Scoring, and Radiomics Features on MR Enterography for Characterizing Severe Inflammation and Fibrosis in Stricturing Crohn's Disease

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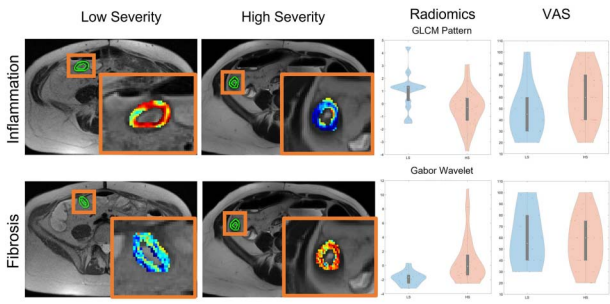
Introduction: Current non-invasive cross-sectional imaging modalities such as MR enterography (MRE) offer excellent diagnostic accuracy of Crohn's disease (CD) strictures, but cannot accurately determine the extent of stricture fibrosis and inflammation. Radiomics, a quantitative image extraction analysis technology, may offer a solution. We present initial results for a machine-reader evaluation of severe inflammation and fibrosis in CD strictures via quantitative radiomic features and expert radiologist scoring of MRE.
Methods: In this retrospective, single center, IRB-approved study, 51 patients (n=34 for discovery; n=17 for hold-out validation) had confirmed stricturing CD on MRE and histopathology from surgery within 15 weeks of MRE. Histopathological Stenosis Therapy & Research (STAR) scoring of specimens (range 0-100, scores ≥50 =severe) was the reference standard for both inflammation and fibrosis. An expert radiologist coordinated with the scoring pathologist to annotate the resected strictures on MRE and provide a global visual analog score (VAS, 0-100) assessment of inflammation and chronic non-inflammatory findings (fibrosis). 1852 3D radiomic features were extracted from the stricture regions on MRE, from which the most relevant feature subsets were identified via cross-validated machine learning analysis in the discovery cohort for differentiating between severe vs less severe inflammation and fibrosis. Radiomic features and VAS scores were evaluated against pathology-defined severe inflammation and fibrosis in the validation cohort via ROC analysis.
Results: Two distinct sets of radiomic features capturing textural heterogeneity (patterns, local entropy) within strictures were significantly associated ($p< 0.01$) with severe inflammation and severe fibrosis; across both discovery (AUC=0.66, 0.76) and hold-out validation (AUCs =0.71,0.83) (Figure). Radiological VAS had an AUC=0.68 for identifying severe inflammation and AUC =0.47 for severe fibrosis. Combining radiomic features and VAS had no significant impact on predictor performance. Clinical variables including sex, age, Montreal classification and stricture type were not significantly associated severe inflammation or fibrosis, across discovery and validation groups (Table).
Conclusion: Radiomic analysis shows improved performance in identifying severe inflammation and severe fibrosis in CD strictures on MRE compared to radiological visual assessment scoring and clinical variables.



[0762] **Figure 1.** Top-ranked radiomics features are distinctively associated with severe inflammation (top row, pattern-based) and severe fibrosis (bottom row, wavelets) on MRE. Also shown are radiological VAS for severe inflammation and severe fibrosis.

Table 1. Demographics and baseline clinical features of the cohort, segregating discovery and hold-out validation radiomic cohorts

	MRE Overall (N=51)		Fibrosis Discovery Group (N=34)		Fibrosis Validation Group (N=17)			Inflammation Discovery Group (N=34)		Inflammation Validation Group (N=17)		
Factor	**N**	**Statistics**	**N**	**Statistics**	**N**	**Statistics**	***P*-value**	**N**	**Statistics**	**N**	**Statistics**	***P*-value**
Male Sex, n (%)	51	26 (51)	34	16 (47)	17	10 (57)	0.43[a]	34	15 (44)	17	11 (65)	0.17[a]
Diagnosis age of IBD, median (range), yrs	51	21 (4-90)	34	24 (10-90)	17	20 (2-62)	0.88[c]	34	20.5 (5-67)	17	25 (4-90)	0.79[c]
Diagnosis age of Stricture, median (range), yrs	51	32 (11-90)	34	30.5 (19-90)	17	33 (11-69)	0.78[c]	34	29.5 (11-71)	17	35 (20-90)	0.24[c]
Age at MRE, median (range), yrs	51	34 (18-91)	34	33 (19-91)	17	36 (18-69)	0.83[c]	34	31 (18-71)	17	37 (22-91)	0.21[c]
Duration between IBD/stricture dx, median (range), years	51	8 (0-30)	34	6.5 (0-30)	17	10 (0-26)	0.62[c]	34	7.5 (0-30)	17	8 (0-21)	0.8[c]
Duration between Stricture dx/Surgery, median (range), months	51	9 (0-145)	51	10 (0-145)	17	6 (0-121)	0.82[c]	34	5.5 (0-145)	17	19 (0-78)	0.24[c]
Duration between MRE and resection, median (range), weeks	51	7.1 (0-15)	34	7.35 (0-13)	17	7 (0.9-15)	0.36[c]	34	7.9 (0.1-15)	17	7.1 (0-14.9)	0.93[c]
Obstructive Symptoms at time of imaging, n (%)	51	42 (82)	34	28 (82)	17	14 (82)	1[b]	34	27 (79)	17	15 (88)	0.7[b]
CD Montreal Classification, n (%)	51		34		17		0.64[a]	34		17		0.14[a]
B2 (Stricturing)		23 (45)		14 (41)		9 (53)			17 (50)		6 (35)	
B2p (Stricturing with perianal disease)		15 (29)		11 (32)		4 (23)			11 (32)		4 (23)	
B3 (Fistulizing)		6 (12)		5 (15)		1 (6)			4 (12)		2 (12)	
B3p (Fistulizing with perianal disease)		7 (14)		4 (12)		3 (18)			2 (6)		5 (29)	
History of extraintestinal manifestations, n (%)	51	32 (63)	34	22 (65)	17	10 (59)	0.68[a]	34	22 (65)	17	10 (59)	0.68[a]
Ileocecal resection prior to current stricture, n (%)	51	25 (49)	34	17 (50)	17	8 (47)	0.84[a]	34	16 (47)	17	9 (53)	0.69[a]
Number of resections, median (range)	25	2 (1-5)	16	2 (1-5)	8	2 (1-4)	0.88[c]	16	2 (1-4)		2 (1-5)	0.94[c]
Type of stricture, n (%)	51		34		17		1[a]	34		17		1[a]
Naïve		27 (53)		18 (53)		9 (53)			18 (53)		9 (53)	
Anastomotic		24 (47)		16 (47)		8 (47)			16 (47)		8 (47)	
Medications for IBD < 8 weeks from imaging, n (%)	51		34		17			34		17		
5-aminosalicylic-acid, oral or rectal		10 (20)		8 (24)		2 (12)	0.46[b]		6 (18)		4 (24)	0.71[b]
Steroid, systematic		19 (37)		11 (32)		8 (47)	0.31[a]		12 (35)		7 (41)	0.68[a]
Steroid, rectal or Budesonide		12 (24)		9 (27)		3 (18)	0.73[b]		8 (24)		4 (24)	1[b]
Mercaptopurine or Azathioprine		12 (24)		7 (21)		5 (29)	0.5[b]		10 (29)		2 (12)	0.29[b]
Methotrexate		2 (4)		2 (6)		0 (0)	0.55[b]		1 (3)		1 (6)	1[b]
Certolizumab		2 (4)		2 (6)		0 (0)	0.55[b]		1 (3)		1 (6)	1[b]
Adalimumab		13 (25)		10 (29)		3 (18)	0.5[b]		8 (24)		5 (29)	0.74[b]
Infliximab		5 (10)		3 (9)		2 (12)	1[b]		4 (12)		1 (6)	0.65[b]
Vedolizumab		5 (10)		4 (12)		1 (6)	0.65[b]		2 (6)		3 (18)	0.32[b]
None		6 (12)		4 (12)		1 (6)	0.65[b]		4 (12)		1 (6)	0.65[b]
Global Assessments by Radiologist												
Global Stricture Severity, median (range), 0-100	51	60 (20-100)	34	50 (20-100)	17	60 (20-100)	0.4[c]	34	60 (20-100)	17	40 (20-95)	0.44[c]
Global Inflammation Severity, median (range), 0-100	51	40 (15-95)	34	40 (15-85)	17	50 (15-95)	0.27[c]	34	40 (15-85)	17	40 (15-95)	0.7[c]
Global Chronic non-inflammatory changes Severity, median (range), 0-100	51	30 (5-80)	34	30 (5-80)	17	40 (5-80)	0.16[c]	34	30 (5-80)	17	30 (5-70)	0.89[c]
Global Assessments by Pathologist												
Severity of inflammation, median (range), 0-100	51	66 (2-100)	34	67 (2-100)	17	64 (10-94)	0.52[c]	34	61.5 (2-100)	17	67 (10-100)	0.73[c]
Severity of fibrosis, median (range), 0-100	51	60 (5-94)	34	60 (5-94)	17	55 (10-88)	0.93[c]	34	57.5 (5-94)	17	63 (10-90)	0.93[c]

[a]Chi-Square test
[b]Fisher exact test
[c]Mann Whitney U test.
MRE: magnetic resonance enterography; N: Number; IBD: inflammatory bowel disease; dx: diagnosis; CD: Crohn's disease.

S763

Twenty Percent of Patients With Inflammatory Conditions of the Pouch Demonstrate a More Refractory Disease State Within Twelve Months of Enrollment in a Multicenter Prospective Registry

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Introduction: Up to 80% of patients will develop pouchitis after proctocolectomy with ileal pouch-anal anastomosis (IPAA) for ulcerative colitis, and approximately 10% will develop Crohn's disease (CD) of the pouch. We designed a geographically diverse, eight-center, prospective registry to study the disease course among patients with one of four inflammatory conditions of the pouch. The aim of this study was to evaluate patterns of changes in diagnosis during the first 12 months after enrollment.
Methods: We enrolled patients with a confirmed diagnosis of acute pouchitis, chronic antibiotic dependent pouchitis (CADP), chronic antibiotic refractory pouchitis (CARP), or CD of the pouch. Diagnoses were based on standardized criteria and we obtained detailed clinical and demographic data at the time of enrollment. Patients completed follow-up assessments at 3, 6, and 12 months after enrollment, with treating physicians confirming their respective diagnoses at each time point. Associations between clinical and demographic data at baseline and a switch in diagnosis to a more refractory disease state were analyzed using chi-square testing.
Results: We enrolled 318 patients (10% acute pouchitis, 27% CADP, 12% CARP, and 51% CD of the pouch). During the first 12 months after enrollment, 31 of the 157 patients (20%) without CD of the pouch at enrollment switched diagnosis to a more refractory disease state, with 20 of 31 (65%) patients ultimately being diagnosed with CD of the pouch. Among 7 patients with acute pouchitis who switched diagnoses,

5 were diagnosed with CADP, 1 with CARP, and 1 with CD of the pouch. Among 19 patients with CADP who switched diagnoses, 4 were diagnosed with CARP and 15 were diagnosed with CD of the pouch. Four patients with CARP had a change in diagnosis to CD of the pouch during the study period. Patients who experienced a change in diagnosis were significantly more likely to be current smokers when compared to patients with no change in diagnosis during the study period (23% vs. 5%, p=0.001, Table).

Conclusion: In a prospective registry of 318 patients from eight centers in the United States, 20% of patients without CD of the pouch at enrollment experienced a change in diagnosis to a more refractory inflammatory condition of the pouch during the first 12 months after enrollment. Patients who were current smokers were more likely to change diagnoses, and may represent a high risk group for earlier intervention and targeted smoking cessation efforts after IPAA.

Table 1. Comparison of Baseline Demographics and Clinical Characteristics of Patients with an Inflammatory Condition of the Pouch and a Change in Diagnosis to those with No Change in Diagnosis

	Change in Diagnosis within 12 Months of Enrollment n=31		No Change in Diagnosis within 12 Months of Enrollment n=287		p-value
	Median	IQR	Median	IQR	
Current Age	50	44-59	52	38-62	0.873
	n	%	n	%	
Female Sex	12	39	129	45	0.636
Race					>0.999
White	29	94	263	92	
Black	1	3	16	6	
Other	1	3	8	3	
Hispanic ethnicity	3	10	7	2	0.063
BMI					0.271
Normal	17	55	114	40	
Overweight	7	23	99	34	
Obese	7	23	71	25	
Disease extent prior to surgery					0.447
Proctitis	2	6	19	7	
Left-sided colitis	5	16	22	8	
Extensive colitis	19	31	151	61	
Unknown	4	13	52	18	
Indication for surgery					>0.999
Medically-refractory colitis	29	94	256	89	
Dysplasia/colorectal cancer	1	3	13	5	
Medically refractory + dysplasia/colorectal cancer	0	0	8	3	
Other	1	3	9	3	
Number of stages in surgery					0.590
1	2	6	35	12	
2	10	32	114	40	
Modified 2	3	10	19	7	
3	15	48	103	36	
IPAA surgery performed at current medical center	20	65	181	63	>0.999
Primary Sclerosing Cholangitis	2	6	23	8	>0.999
Clostridiodes difficile infection prior to IPAA	4	13	42	15	>0.999
Smoker at the time of colectomy	2	6	15	5	0.678
Current smoker	7	23	13	5	0.001
NSAIDs in the prior two weeks	12	39	104	36	0.846

S764

Yield of Dysplasia Surveillance Biopsies in Inflammatory Bowel Disease

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Introduction: Inflammatory bowel disease (IBD) dysplasia surveillance protocols call for a representative number of untargeted or 'random' biopsies to increase the odds of detection of 'invisible' or flat dysplasia. In current practice, the benefit of untargeted surveillance biopsies over a targeted surveillance approach with or without adjunctive chromoendoscopy is unclear. Our study retrospectively examines outcomes of endoscopic dysplasia surveillance at a single institution and compares yields of targeted and untargeted biopsies for the detection of dysplasia from both chromoendoscopy (CE) and traditional high definition white light (HD-WLE) examinations.

Methods: A retrospective chart review of all IBD patients (ulcerative colitis, Crohns, and indeterminate colitis) undergoing dysplasia surveillance at a single center between 1/2015 and 10/2021 was performed. Patients younger than 18 and those with a pre-existing diagnosis of dysplasia or cancer were excluded. All surveillance exams done for each patient during the study period were reviewed. Presence or absence of endoscopic and microscopic inflammation, use of targeted biopsies or polypectomy, number of untargeted biopsies, and presence or absence of dysplasia from both targeted and untargeted biopsies were noted for both HD-WLE and CE exams. All instances of 'invisible' dysplasia were confirmed by a second reviewer following manual review of endoscopy and pathology reports.

Results: 200 IBD patients (96 UC, 94 Crohns, 10 indeterminate) underwent 492 endoscopic surveillance procedures (199 CE, 293 WLE). 11,094 untargeted biopsies and 242 targeted biopsies or polypectomies were performed. Invisible dysplasia was detected 9 times for a yield of 0.06% per untargeted biopsy. 37.2% of endoscopically targeted biopsies or polypectomies were positive for dysplasia (39.6% CE, 33.9% WLE) and accounted for 90.9% of dysplasia detected during the study period.

Conclusion: Random biopsies are a low yield means for detection of dysplasia, accounting for < 10% of dysplastic lesions observed during the study period. No patients with 'invisible' dysplasia had PSC, opted for colectomy, or had evidence of progression on follow up examination. Given the high yield of targeted biopsy and polypectomy, and low likelihood of missed high risk lesions if untargeted biopsies are not performed, it may be reasonable to emphasize high quality endoscopic examination and targeted biopsies/polypectomies and to de-emphasize the role of untargeted random biopsies.

S765

Association of Ulcerative Colitis Bowel Urgency Improvement with Clinical Response and Remission

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Introduction: Early bowel movement urgency (BU) improvement association with later clinical endpoint improvements was examined in moderately-to-severely active ulcerative colitis (UC) patients (pts) treated with mirikizumab (miri).
Methods: BU was evaluated in Phase 3 randomized placebo (PBO)-controlled 12-week induction (LUCENT-1, NCT03518086) and 40-week maintenance (LUCENT-2, NCT03524092) trials with miri. Pts received IV miri 300mg or PBO during induction. Week (W)12 miri responders were rerandomized at LUCENT-2 baseline (BL) to subcutaneous miri 200mg or PBO. BU was measured with 11-point Urgency Numeric Rating Scale (UNRS) from 0 (no urgency) to 10 (worst possible). Pts' UNRS scores were an average from 7 consecutive days prior to visit. Association of pts with BU Clinically Meaningful Improvement (CMI) or BU remission between BL and W4 with the proportion of pts achieving clinical response, and clinical, endoscopic, or symptomatic remission at end of W12 was assessed. For pts who achieved clinical response at W12, the analyses were repeated for the end of maintenance based on W12 BU status. Logistic regression models with treatment, urgency (BU CMI or BU Remission), treatment-by-urgency group interaction, and stratification factors were fitted to examine the association between early urgency improvement and later clinical endpoints.
Results: Treatment-by-urgency group interactions were not statistically significant across clinical outcomes for induction and maintenance. For induction, treatment and urgency status were statistically significant. Pts experiencing BU CMI or BU remission at W4 were consistently more likely to achieve clinical response, and clinical, endoscopic, or symptomatic remission at W12 for both treatment groups. For remission, only treatment main effect was statistically significant. Among miri induction clinical responders (an enriched population), BU CMI or BU Remission at end of induction (W12) was not associated with later maintenance efficacy outcomes (W52). Miri-treated pts achieved higher rates of clinical response, and clinical, endoscopic, or symptomatic remission at W52 than with PBO regardless of BU CMI or BU Remission at W12 (Table).
Conclusion: Early BU Improvement, CMI or Remission, was associated with better clinical outcomes during induction for miri and PBO pts, showing BU is a sensitive predictor of early clinical outcomes. Among miri induction responders, miri consistently provided better maintenance of response and remission rates than PBO.

Table 1. Bowel urgency associations with Clinical Response and Clinical Remission for patients with moderate-to-severely active ulcerative colitis

LUCENT-1 Induction

Urgency CMI				Urgency Remission			
Endpoint	**PBO IV (N=276)**	**Miri 300mg IV (N=811)**	***p*-value[a]**	**Endpoint**	**PBO (N=276)**	**Miri 300mg IV (N=811)**	***p*-value[a]**
Urgency CMI W4 = Yes	n=61	n=230		Urgency remission W4 = Yes	n=13	n=65	
Clin. Response W12, (%)	68.9	78.7	0.126	Clin. Response W12, (%)	76.9	81.5	NA[b]
Clin. Remission W12, (%)	27.9	37.4	0.179	Clin. Remission W12, (%)	46.2	47.7	NA[b]
Endo. Remission W12, (%)	36.1	49.1	0.083	Endo. Remission W12, (%)	46.2	52.3	NA[b]
Sympt. Remission W12, (%)	49.2	63.5	0.055	Sympt. Remission W12, (%)	69.2	70.8	NA[b]
Urgency CMI W4 = No	n=215	n=581		Urgency remission W4 = No	n=263	n=746	
Clin. Response W12, (%)	34.9	57.5	< 0.001	Clin. Response W12, (%)	40.7	61.9	< 0.001
Clin. Remission W12, (%)	8.8	18.4	< 0.001	Clin. Remission W12, (%)	11.4	21.7	< 0.001
Endo. Remission W12, (%)	16.7	29.6	< 0.001	Endo. Remission W12, (%)	19.8	33.6	< 0.001
Sympt. Remission W12, (%)	21.4	38.7	< 0.001	Sympt. Remission W12, (%)	25.5	43.6	< 0.001

LUCENT-2 Maintenance

Urgency CMI				Urgency Remission			
Endpoint	**PBO SC (N=172)**	**Miri 200mg SC (N=336)**	***p*-value[a]**	**Endpoint**	**PBO SC (N=172)**	**Miri 200mg SC (N=336)**	***p*-value[a]**
Urgency CMI W12 = Yes	n=112	n=212		Urgency remission W12 = Yes	n=53	n=105	
Clin. Response W52 (%)	52.7	82.5	< 0.001	Clin. Response W52 (%)	47.2	82.9	< 0.001
Clin. Remission W52 (%)	29.5	53.3	< 0.001	Clin. Remission W52 (%)	34.0	55.2	0.012
Endo. Remission W52 (%)	31.3	60.4	< 0.001	Endo. Remission W52 (%)	35.8	61.0	0.004
Sympt. Remission W52 (%)	43.8	74.1	< 0.001	Sympt. Remission W52 (%)	45.3	79.0	< 0.001
Urgency CMI W12 = No	n=60	n=124		Urgency remission W12 = No	n=119	n=231	
Clin. Response W52 (%)	45.0	79.0	< 0.001	Clin. Response W52 (%)	51.3	80.5	< 0.001
Clin. Remission W52 (%)	18.3	47.6	< 0.001	Clin. Remission W52 (%)	21.8	49.4	< 0.001
Endo. Remission W52 (%)	26.7	57.3	< 0.001	Endo. Remission W52 (%)	26.9	58.4	< 0.001
Sympt. Remission W52 (%)	35.0	69.4	< 0.001	Sympt. Remission W52 (%)	38.7	69.3	< 0.001

[a]*p*-value = within-group treatment comparison from Fisher's exact tests.
[b]Subgroup N was too small for p-value generation.
Urgency CMI: UNRS=≥3 point decrease; Urgency remission: UNRS=0 or 1.
Note: Using the Cochran-Mantel-Haenszel (CMH) test, treatment-by-subgroup interactions were not statistically significant.
Note: W52 refers to W40 of LUCENT-2, representing 52 weeks of continuous treatment; W12 refers to baseline for LUCENT-2. Abbreviations: CMI=clinically meaningful improvement; PBO=placebo; miri=mirikizumab; IV=intravenous; n=number of patients in the specified category; SC=subcutaneous; W=week.

S766

The Effect of Mirikizumab on Fecal Calprotectin and C-Reactive Protein in Phase 3 Studies of Patients With Moderately-to-Severely Active Ulcerative Colitis

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Introduction: This study explores the effect of mirikizumab (miri) on inflammatory biomarkers fecal calprotectin (FC) and C-reactive protein (CRP) in patients with moderately-to-severely active ulcerative colitis (UC).
Methods: In LUCENT-1 (NCT03518086), 1162 patients were randomized 3:1 to receive intravenous miri 300 mg or placebo (PBO) every 4 weeks for 12 weeks. Patients (N=544) who achieved clinical response with miri at Week (W) 12 were re-randomized 2:1 in LUCENT-2 (NCT03524092) to receive blinded miri 200 mg or PBO subcutaneously every 4 weeks through W40 (52 weeks continuous therapy). Treatment comparison of change from baseline in FC and CRP levels were made using ANCOVA analysis. Comparison of proportion of patients achieving FC ≤250 μg/g used a Cochran–Mantel Haenszel test treating missing data as nonresponse.

Results: At baseline, the median FC was 1556.0 μg/g in the miri group and 1465.0 μg/g in the PBO group (Table); the proportion of patients with FC >250 μg/g were similar between treatment groups (miri: 90.4%; PBO: 88.9%). At both W4 and W12 of LUCENT-1, miri-treated patients showed greater reduction in FC from baseline compared to PBO (p< .001). Among patients with baseline FC level >250 μg/g, a greater proportion of miri-treated patients achieved an FC level of ≤250 μg/g compared to PBO (34.3% vs 20.1%; adjusted risk difference: 14.6%; 95% confidence interval [CI]: 8.3%–20.9%; p< .001) at W12. For those who continued with maintenance therapy in LUCENT-2, at W40, miri-treated patients sustained greater FC reduction from baseline compared to PBO (p< .001). A greater proportion of miri-treated patients with induction baseline FC >250 μg/g achieved FC level of ≤250 μg/g compared to PBO (50.7% vs 19.3%; adjusted risk difference: 29.1%; 95% CI: 20.5%–37.7%; p< .001) at W40. At baseline, the median CRP was 4.0 mg/L in the miri group and 4.3 mg/L in the PBO group (Table). At W12, patients in the miri group showed greater reduction in CRP from baseline compared to PBO (p< .001). Among those who continued in LUCENT-2, at W40, miri-treated patients sustained greater reduction in CRP from baseline compared to PBO (p< .001).
Conclusion: Patients treated with miri in both induction and maintenance studies were more likely to achieve an FC ≤ 250 μg/g and showed significantly greater reductions from baseline in FC and CRP when compared to PBO.

Table 1. Fecal calprotectin and c-reactive protein values at baseline, week 12, and week 40

Biomarker	Study	Time Point	Treatment	n	Median (IQR)	LS Mean (SE)[b]	LS Mean Difference[b] (95% CI[b])	Between Treatment P-value[b]
Fecal Calprotectin	LUCENT-1	Baseline	Placebo	243	1465.0 (618.0-2839.0)	2970.1 (303.5)	-	-
			Miri 300 mg IV	722	1556.0 (635.0-3210.0)	3121.4 (176.1)		
		Week 12	Placebo	243	1040.0 (290.0-2427.0)	2386.0 (206.9)	-1164.1 (-1613.1, -715.0)	< .001
			Miri 300 mg IV	722	398.0 (95.0-1311.0)	1221.9 (129.9)		
	LUCENT-2 (miri induction responder)	Week 40[a]	Placebo	156	496.0 (112.5-1956.0)	1862.6 (221.4)	-839.6 (-1323.1, -356.2)	< .001
			Miri 200 mg SC	302	155.0 (40.0-657.0)	1022.9 (172.4)		
C-Reactive Protein	LUCENT-1	Baseline	Placebo	279	4.3 (1.2-9.3)	9.4 (0.9)	-	-
			Miri 300 mg IV	837	4.0 (1.5-9.5)	9.3 (0.5)		
		Week 12	Placebo	279	3.1 (1.0-9.0)	8.4 (0.6)	-3.7 (-5.0, -2.5)	< .001
			Miri 300 mg IV	837	1.7 (0.7-4.9)	4.7 (0.4)		
	LUCENT-2 (miri induction responder)	Week 40[a]	Placebo	178	1.6 (0.7-5.1)	7.0 (0.7)	-3.3 (-4.9, -1.7)	< .001
			Miri 200 mg SC	359	1.4 (0.5-4.0)	3.6 (0.5)		

ANCOVA=analysis of covariance; CI=confidence interval; IQR=interquartile range; IV=intravenous; LS=least square; miri=mirikizumab; n=number of patients with baseline and post-baseline value at specified timepoint; SC=subcutaneous; SE=standard error.
[a]52 weeks of continuous therapy.
[b]ANCOVA model for endpoint measures; patients with missing value at the designated timepoint had their last value carried forward, with the exception that patients who discontinued due to an adverse event had their baseline value carried forward.

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Hospitalization and Surgery Rates in Patients Awaiting Approval of Biologics or Small Molecules for Treating Inflammatory Bowel Disease (IBD)

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Introduction: Advanced IBD therapies including biological agents (infliximab, adalimumab, ustekinumab, golimumab, certolizumab pegol, and vedolizumab) and oral inhibitors (tofacitinib and ozanimod) have become mainstays of treatment for moderate to severe Crohn's disease and ulcerative colitis. Although providers have anecdotal evidence that delays in insurance approval for these treatments might result in adverse outcomes, the rate of hospitalization and surgery during the prior approval process have not been formally evaluated. This study was designed to assess the rate of IBD-related hospitalizations and surgeries in individuals awaiting prior authorization for their advanced IBD therapy.
Methods: To assess the impact of the prior authorization process on clinical outcomes, we obtained IRB approval to evaluate the charts of individuals with IBD treated at our institution between of 3/1/2019-12/31/2021. Our state does has not adopted universal Medicaid. During this period, we found 542 individuals who had been started on a biological agent or an oral inhibitor. Using a data collection tool developed in the Harvard system, we identified 182 patients in whom we had complete data set. A complete data set included demographic data, disease variables, past medication history, insurance status, date of decision for medication, date of prior authorization, date of intuition of therapy, and clinical outcomes during the prior authorization period.
Results: Of 182 IBD patients with complete data sets, we found that 64.3% of them had previously been treated with an advanced IBD therapy. Despite this, the average interval between decision and initiation of therapy was 43 days (40 days for commercial insurance, 49 days for Medicare, 45 days for Medicaid, and 42 days for those without insurance.) During the delay, 14.3% of patients had an ED visit, 14.8% were admitted to hospital, and 8.2% of patients required surgical intervention (bowel resections). It should be noted that these delays occurred despite having a full time IBD pharmacist.
Conclusion: During the waiting period for the approval of appropriate, advanced IBD therapies, 15% of patients were hospitalized and 8.2% underwent surgery for their disease. This data suggests that the time to advanced IBD therapy approval probably needs to be shortened so as to reduce morbidly in this patient population. Further study across multiple institutions will be necessary in order to better address this important issue.

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Real World Ustekinumab Experience in Ileum-Dominant versus Colonic Crohn's Disease

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Introduction: Crohn's disease (CD) presents with diverse phenotypes, affecting the ileum, colon or both. There is literature to suggest that ileal or ileocolonic CD behaves differently than colonic CD. It remains unclear how different CD phenotypes impact response to therapy. The aim of this study was to compare the performance of ustekinumab in ileum-dominant and colonic CD.
Methods: We performed a single center, IRB-approved, retrospective review of all adult CD patients who received ustekinumab. We stratified patients by ileal involvement: ileum-dominant (ileal and ileocolonic) and colonic CD. We collected data on disease duration, disease behavior, prior biologic therapy, concomitant immunomodulator, CD-related surgeries and hospitalizations, serum c-reactive protein (CRP), and endoscopic presence of ulcers. The primary outcome was absence of ulcers on follow-up colonoscopy. The secondary outcomes included CRP, calprotectin, surgery, and hospitalization. Chi-square tests (or Fisher's exact test) and two-sample t-tests (or Wilcoxon's rank sum test) were used to compare categorical and numeric variables between groups, respectively; analyses were performed using R Computing Software versions 3.6.1.
Results: 84 patients with ileum-dominant CD and 27 patients with colonic CD were treated with ustekinumab. Baseline characteristics of the cohort are in Table. The median time to follow-up endoscopy was 13 months. Follow-up colonoscopy after ustekinumab therapy was ulcer-free in 45% of ileum-dominant CD and 76% of colonic CD (p=0.02). Of patients with ulcers on endoscopy prior to starting ustekinumab, 24% of ileum-dominant CD and 67% of colonic CD were ulcer-free (p=0.01) on follow-up colonoscopy. There were similar rates of hospitalizations and surgery and no significant differences in mean calprotectin and CRP between the two groups on follow-up after ustekinumab therapy.
Conclusion: This updated real-world experience of ustekinumab demonstrates higher rates of endoscopic healing among colonic CD when compared to ileum-dominant CD. Disease location may predict endoscopic healing by ustekinumab in CD. Further studies are necessary to expand our understanding of different CD phenotypes and their responsiveness to ustekinumab.

Table 1. Baseline Disease Characteristics of Patients with Ileum-Dominant and Colonic CD

	Ileum-Dominant CD (n=84)	Colonic CD (n=27)
Age at diagnosis, n, mean years +/- SD	84, 27.7 +/- 13.8	27, 37.6 +/- 17.0
Female gender, n, %	42, 50.0%	17, 63.0%
Tobacco use	16, 19.1%	2, 7.4%
Median Disease duration, years (25th, 75th)	10.8, (5.4, 20.1)	5.2, (2.1, 16.0)
Disease Behavior		
B1, n, %	25, 29.8%	13, 48.2%
B2, B3, or B2/B3, n, %	59, 70.2%	14, 51.9%
Perianal Disease, n, %	20, 23.8%	11, 40.7%
Prior anti-TNF use, n, %	76, 90.5%	21, 77.8%
0, n, %	8, 9.5%	6, 22.2%
1, n, %	18, 23.7%	12, 57.1%
2, n, %	50, 65.8%	4, 19.1%
3, n, %	8, 10.5%	2, 9.5%
4, n, %	0, 0%	3, 14.3%
Prior anti-integrin use	18, 21.4%	10, 37.0%
History of prior Crohn's related surgery, n, %	43, 51.2%	12, 44.4%
Concomitant therapy (steroids or thiopurine/MTX), n, %	34, 40.5%	9, 33.3%

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Association Between Severity, Socioeconomic Factors, Patient-Reported Outcomes, and Healthcare Resource Use Across Racial/Ethnic Groups in Inflammatory Bowel Disease: Results From the National Health and Wellness Survey

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Introduction: Black, Indigenous, and People of Color (BIPOC) with inflammatory bowel disease (IBD) experience greater socioeconomic disadvantages and often present with more advanced disease than White patients. In this study, we assessed the relationship of race/ethnicity and IBD severity with socioeconomic factors, health-related quality of life (HRQoL), and healthcare resource use (HCRU) in individuals with IBD.
Methods: Data were obtained for adults self-reporting a physician diagnosis of Crohn's disease (CD) or ulcerative colitis (UC) from the National Health and Wellness Survey (2018-2020). Bivariate (interim) analyses were conducted to compare socioeconomic factors, HRQoL, HCRU, and costs by IBD severity within racial/ethnic groups.
Results: Analyses included 2,577 participants (CD: 818 White, 109 Black, and 150 Hispanic; UC: 1,150 White, 99 Black, and 251 Hispanic). Black participants with moderate/severe CD had fewer social and financial resources than those with mild CD, including a higher proportion of single (70.7% vs. 58.8%), uninsured (17.2% vs. 11.8%), and low-household–income (< $25,000/year; 41.4% vs. 15.7%) participants; these factors did not consistently differ by disease severity in White or Hispanic participants with CD. Increased disease severity was associated with worse HRQoL and work productivity across several PROs (PHQ-9, MCS, PCS, SF-6D index, EQ-5D index, and WPAI; all P≤0.036) and greater HCRU in all participants with UC and in Black and White, but not Hispanic, participants with CD. Although not directly comparable in the bivariate analysis, a higher proportion of Black participants with moderate/severe CD were single (70.7% vs. 33.9%), uninsured (17.2% vs. 8.9%), and had low household income (< $25,000/year; 41.4% vs. 12.8%) than White participants. White participants with moderate/severe UC had lower mean annualized direct medical costs than Black and Hispanic participants ($56,002, $93,298, and $106,693, respectively). (Table)
Conclusion: Increased disease severity was associated with worse HRQoL and work productivity and higher HCRU in Black and White participants with CD and in all racial/ethnic groups with UC. Negative socioeconomic factors also increased with moderate/severe disease in Black, but not White or Hispanic, participants with CD. These findings suggest a need to better understand associations between race/ethnicity, disease severity, socioeconomic factors, and health outcomes in IBD.

Table 1. Sociodemographic characteristics, HRQoL, HCRU, and costs in White, Black, and Hispanic participants with IBD by disease severity

	White		Black		Hispanic	
CD	Mild (n = 514)	Moderate/Severe (n = 304)	Mild (n = 51)	Moderate/Severe (n = 58)	Mild (n = 83)	Moderate/Severe (n = 67)
Marital status, n (%)						
Married/living with a partner	317 (61.7%)	201 (66.1%)	21 (41.2%)	16 (27.6%)	52 (62.7%)	42 (62.7%)
Single, not married/divorced/ separated/ widowed	196 (38.1%)	103 (33.9%)	30 (58.8%)	41 (70.7%)*	31 (37.3%)	25 (37.3%)
Decline to answer	1 (0.2%)	0 (0.0%)	0 (0.0%)	1 (1.7%)	0 (0.0%)	0 (0.0%)
Household income, n (%)						
< $25,000	63 (12.3%)	39 (12.8%)	8 (15.7%)	24 (41.4%)*	10 (12.0%)	6 (9.0%)
$25,000 to < $50,000	107 (20.8%)	56 (18.4%)	10 (19.6%)	10 (17.2%)	18 (21.7%)	11 (16.4%)
$50,000 to < $100,000	179 (34.8%)	110 (36.2%)	18 (35.3%)	11 (19.0%)	26 (31.3%)	21 (31.3%)
$100,000+	152 (29.6%)	94 (30.9%)	15 (29.4%)	12 (20.7%)	29 (34.9%)	28 (41.8%)
Decline to answer	13 (2.5%)	5 (1.6%)	0 (0.0%)	1 (1.7%)	0 (0.0%)	1 (1.5%)
Health insurance, n (%)						
Not insured	31 (6.0%)	27 (8.9%)	6 (11.8%)	10 (17.2%)	12 (14.5%)	9 (13.4%)
Commercially insured	289 (56.2%)	167 (54.9%)	36 (70.6%)	29 (50.0%)	50 (60.2%)	41 (61.2%)
Medicaid	50 (9.7%)	31 (10.2%)	2 (3.9%)	8 (13.8%)	5 (6.0%)	6 (9.0%)
Medicare	133 (25.9%)	70 (23.0%)	5 (9.8%)	10 (17.2%)	10 (12.0%)	4 (6.0%)
Other type of insurance/unsure	11 (2.1%)	9 (3.0%)	2 (3.9%)	1 (1.7%)	6 (7.2%)	7 (10.4%)

Table 1. (*continued*)

CD	White		Black		Hispanic	
	Mild (n = 514)	Moderate/Severe (n = 304)	Mild (n = 51)	Moderate/Severe (n = 58)	Mild (n = 83)	Moderate/Severe (n = 67)
HRQoL, mean (SD)						
PHQ-9 score[a]	7.36 (6.86)	11.10 (7.70)*	6.71 (5.66)	9.76 (5.40)*	11.59 (7.57)	13.76 (6.64)
GAD-7 score[b]	5.72 (5.87)	7.94 (6.40)*	5.80 (5.37)	7.45 (4.53)	8.54 (5.98)	10.67 (5.45)*
MCS score[c]	43.50 (11.83)	38.82 (11.55)*	43.38 (10.24)	38.64 (10.85)*	38.54 (9.87)	34.87 (9.63)*
PCS score[c]	46.08 (9.77)	39.96 (10.02)*	48.53 (8.15)	40.32 (8.93)*	42.78 (8.39)	40.95 (7.80)
SF-6D Index score[c]	0.660 (0.147)	0.579 (0.12)*	0.664 (0.136)	0.567 (0.11)*	0.574 (0.122)	0.535 (0.12)
EQ-5D Index score[d]	0.764 (0.177)	0.657 (0.23)*	0.772 (0.156)	0.674 (0.17)*	0.651 (0.239)	0.600 (0.22)
EQ VAS score	67.60 (23.85)	56.72 (25.33)*	65.84 (27.84)	55.88 (31.24)	65.00 (27.03)	56.90 (29.32)
HCRU (past 6 months), mean (SD)						
Total number of HCP visits[e]	6.53 (7.48)	8.44 (12.87)*	4.12 (3.37)	7.69 (8.65)*	7.31 (8.61)	7.69 (8.65)*
Total number of GE visits	0.68 (1.09)	0.90 (1.31)*	0.37 (0.75)	1.31 (2.05)*	0.34 (0.83)	1.31 (2.05)*
Total number of ER visits	0.72 (1.76)	1.36 (2.72)*	0.86 (1.98)	1.97 (4.03)	2.13 (7.39)	1.97 (4.03)
Total number of hospitalizations	0.49 (1.30)	1.20 (2.74)*	0.59 (1.46)	1.40 (2.32)*	1.88 (5.22)	1.40 (2.32)*
Costs (USD), mean (SD)						
Total annualized direct medical costs	$41,069 ($59,079)	$75,005 ($125,087)	$35,337 ($58,132)	$75,679 ($92,124)*	$89,906 ($202,298)	$75,679 ($92,124)*
Total annual indirect costs[f]	$14,046 ($17,151)	$19,247 ($18,573)*	$12,554 ($14,177)	$17,562 ($19,416)	$18,047 ($17,471)	$17,562 ($19,416)

UC	White		Black		Hispanic	
	Mild (n = 789)	Moderate/Severe (n = 361)	Mild (n = 61)	Moderate/Severe (n = 38)	Mild (n = 134)	Moderate/Severe (n = 117)
Marital status, n (%)						
Married/living with a partner	501 (63.5%)	217 (60.1%)	19 (31.1%)	10 (26.3%)	63 (47.0%)	62 (53.0%)
Single, not married/divorced/ separated/ widowed	288 (36.5%)	141 (39.1%)	42 (68.9%)	28 (73.7%)	70 (52.2%)	54 (46.2%)
Decline to answer	0 (0%)	3 (0.8%)	0 (0.0%)	0 (0.0%)	1 (0.7%)	1 (0.9%)
Household income, n (%)						
< $25,000	96 (12.2%)	70 (19.4%)*	11 (18.0%)	11 (28.9%)	17 (12.7%)	22 (18.8%)*
$25,000 to < $50,000	161 (20.4%)	74 (20.5%)	13 (21.3%)	12 (31.6%)	35 (26.1%)	18 (15.4%)
$50,000 to < $100,000	290 (36.8%)	119 (33.0%)	21 (34.4%)	8 (21.1%)	36 (26.9%)	38 (32.5%)
$100,000+	209 (26.5%)	90 (24.9%)	16 (26.2%)	7 (18.4%)	39 (29.1%)	38 (32.5%)
Decline to answer	33 (4.2%)	8 (2.2%)	0 (0.0%)	0 (0.0%)	7 (5.2%)	1 (0.9%)
Health insurance, n (%)						
Not insured	44 (5.6%)	44 (12.2%)*	6 (9.8%)	5 (13.2%)	16 (11.9%)	21 (17.9%)
Commercially insured	417 (52.9%)	166 (46.0%)	30 (49.2%)	24 (63.2%)	78 (58.2%)	71 (60.7%)
Medicaid	40 (5.1%)	45 (12.5%)	9 (14.8%)	4 (10.5%)	12 (9.0%)	9 (7.7%)
Medicare	267 (33.8%)	95 (26.3%)	12 (19.7%)	4 (10.5%)	19 (14.2%)	8 (6.8%)
Other type of insurance/unsure	21 (2.7%)	11 (3.0%)	4 (6.6%)	1 (2.6%)	9 (6.7%)	8 (6.8%)
HRQoL, mean (SD)						
PHQ-9 score[a]	6.41 (6.62)	9.90 (7.28)*	7.18 (6.58)	10.79 (6.35)*	8.81 (6.96)	12.76 (7.08)*
GAD-7 score[b]	4.73 (5.26)	7.42 (5.83)*	5.15 (4.83)	8.74 (5.10)*	7.10 (5.45)	9.69 (5.18)*
MCS score[c]	45.74 (11.86)	39.16 (11.85)*	45.43 (11.59)	36.39 (7.21)*	41.05 (10.31)	36.03 (8.79)*
PCS score[c]	46.05 (10.16)	40.97 (9.81)*	46.01 (9.19)	42.35 (6.72)*	45.73 (8.93)	41.31 (8.30)*
SF-6D Index score[c]	0.674 (0.139)	0.588 (0.128)*	0.666 (0.164)	0.541 (0.104)*	0.619 (0.131)	0.548 (0.109)*
EQ-5D Index score[d]	0.766 (0.174)	0.679 (0.196)*	0.786 (0.140)	0.685 (0.169)*	0.714 (0.185)	0.619 (0.217)*
EQ VAS score	67.37 (25.43)	57.99 (25.81)*	71.56 (24.91)	61.63 (32.96)*	67.33 (24.74)	59.61 (29.24)*
HCRU (past 6 months), mean (SD)						
Total number of HCP visits[e]	5.83 (6.23)	23.11 (26.85)*	7.80 (10.43)	6.55 (6.02)	7.59 (15.44)	13.93 (42.93)
Total number of GE visits	0.47 (0.86)	50.27 (31.32)*	0.39 (0.69)	0.45 (1.03)	0.70 (1.71)	1.56 (6.59)
Total number of ER visits	0.50 (1.81)	56.18 (33.83)*	1.10 (2.11)	2.00 (2.72)	1.13 (3.04)	2.84 (5.08)*
Total number of hospitalizations	0.48 (3.16)	53.60 (29.31)	0.98 (1.86)	2.08 (2.81)*	1.73 (7.36)	1.80 (2.51)
Costs (USD), mean (SD)						
Total annualized direct medical costs	$41,016 ($152,411)	$56,002 ($136,303)	$62,168 ($80,425)	$93,298 ($103,897)	$84,639 ($250,376)	$106,693 ($165,679)
Total annual indirect costs[f]	$11,602 ($17,080)	$20,076 ($20,522)*	$11,780 ($15,597)	$14,223 ($17,819)	$15,620 ($16,305)	$18,644 ($16,441)

[a]PHQ-9 includes nine items (range of 0 to 27) where higher scores indicate mores severe depression.
[b]GAD-7 includes seven items (range 0 to 21) and a higher score indicates more severe general anxiety disorder.
[c]Differences in 3 points on the norm-based component summary scores and 0.041 points on health utilities represent clinically meaningful differences.
[d]The minimally important difference for this measure is considered to be approximately 0.074 points.
[e]Includes visits to any of the following: general practitioner/family practitioner; internist; allergist; cardiologist; dentist; dermatologist; diabetologist; endocrinologist; gastroenterologist; geriatrician; gynecologist; hepatologist; infectious disease specialist/infectologist (diseases such as HIV or hepatitis); neurologist; nephrologist; nurse practitioner/physician assistant; obstetrician; oncologist; ophthalmologist; orthopedist; otolaryngologist (ears, nose, and throat specialist); plastic surgeon; podiatrist; psychiatrist; psychologist/therapist; pulmonologist (lung specialist); respiratory therapist; rheumatologist; urologist; other medical specialist.
[f]Indirect costs were only calculated among respondents who were participating in the labor force at the time of the survey and who had a valid response (i.e., non-missing) for the number of hours working in the past 7 days and the number of hours missed in the past 7 days.
* P < 0.05 between mild and moderate/severe disease within the same racial/ethnic group. Note: P values were calculated using Bonferroni-adjusted pairwise comparisons.
Abbreviations: BMI = body mass index; CCI = Charlson comorbidity index; CD = Crohn's disease; EQ = EuroQoL; GAD = general anxiety disorder; GAD = general anxiety disorder; HRCU = healthcare resource utilization; HRQoL = health-related quality of life; MCS = mental component summary; PCS = physical component summary; PHQ = patient health questionnaire; SD = standard deviation; SF = short form; UC = ulcerative colitis; USD = United States dollar; VAS = visual analogue scale.

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Risk of Cardiovascular, Thrombotic and Renal Complications After COVID-19 in Patients With Inflammatory Bowel Disease: A Propensity-Matched Cohort Study

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Introduction: Studies have demonstrated that patients with Coronavirus disease 2019 (COVID-19) are at an increased risk of incident cardiovascular disease (CVD) including cerebrovascular disease, dysrhythmias, ischemic heart disease, myocarditis, pericarditis, heart failure and thromboembolic disease. Renal complications are also frequently reported in patients with COVID-19. Little is known regarding the short and long-term risk of COVID-19 related complications in patients with inflammatory bowel disease (IBD)
Methods: We compared the 1 year risk of cardiac complications (arrhythmias, heart failure, myocarditis and pericarditis), venous thromboembolism (VTE), peripheral artery disease (PAD), ischemic stroke and acute kidney injury (AKI) in patients between IBD and non-IBD cohort after COVID-19 using TriNetX, a multi-institutional database. Sub-group analysis was performed based on vaccination status, disease activity and IBD medications. Active disease was defined as patients requiring IV or PO steroids or initiation of new biologic agent within 6 months prior to diagnosis of COVID-19. Patients with stable disease were steroid free or were not initiated on new biologic for at least 1 year prior to diagnosis of COVID-19. 1:1 propensity-score matching was performed for age, gender, race, ethnicity and all major risk factors of COVID-19 between all cohorts. Adjusted odds ratios (aOR) with 95% confidence interval (CI) were calculated.
Results: The IBD cohort (n = 8,773) had an increased risk for cardiac complications (aOR 1.52, 95% CI 1.33 – 1.73), VTE (1.77, 1.53-2.04), ischemic stroke (2.04, 1.74 – 2.38), AKI (1.34, 1.14 – 1.58) and PAD (1.70, 1.34 – 2.15) after COVID-19 compared to non-IBD cohort. There was no difference between the vaccinated IBD cohort (≥2 vaccine doses) and vaccinated non-IBD cohort for composite outcome of CVD, VTE and AKI (aOR 1.28, 95% CI 0.52 – 3.15). Patients with active disease and COVID19 infection had a higher risk for cardiac complications, VTE and AKI (Figure). There was no difference in the risk of CVD, VTE or AKI in IBD patients on tumor necrosis factor inhibitor (TNFi), immunomodulators, non-TNFi and chronic prednisone compared to patients on 5-aminosalicyclic acid (5-ASA) (Table).
Conclusion: Patients with IBD who are unvaccinated or with active disease are at an increased risk for CVD, thrombotic and renal complications after COVID-19. These patients may benefit from close follow up and aggressive CVD risk factor modification.

	CD	Prevalence per 100000	No CD	Prevalence per 100000	Prevalence Ratio	95% CI	p-value
Glomerulonephritis	310	207.18	24420	72.01	2.88	2.57-3.22	<0.001
Adults (18-65)	180	171.61	13560	67.83	2.53	2.18-2.93	<0.001
Elderly (65+)	120	280.57	10400	131.20	2.14	1.79-2.56	<0.001
Caucasian	230	203.77	16260	88.32	2.31	2.03-2.63	<0.001
African American	60	451.47	5750	148.79	3.03	2.35-3.91	<0.001
Asian	0	0.00	500	92.62	0	0	0.095
Male	120	205.94	12370	82.23	2.51	2.09-3.00	<0.001
Female	190	209.34	11990	64.37	3.25	2.82-3.75	<0.001

	UC	Prevalence per 100000	No UC	Prevalence per 100000	Prevalence Ratio	95% CI	p-value
Glomerulonephritis	260	204.24	24470	72.11	2.83	2.51-3.20	<0.001
Adults (18-65)	140	173.14	13600	67.95	2.55	2.16-3.01	<0.001
Elderly (65+)	120	260.98	10400	131.26	1.99	1.66-2.38	<0.001
Caucasian	210	213.44	16280	88.36	2.42	2.11-2.77	<0.001
African American	40	416.23	5760	148.90	2.80	2.05-3.81	<0.001
Asian	0	0	500	92.61	0	0	0.100
Male	120	236.69	12380	82.25	2.88	2.41-3.44	<0.001
Female	140	183.73	12040	64.59	2.85	2.41-3.36	<0.001

[0770] **Figure 1.** 1 year risk of CVD, thrombotic and renal complications in IBD patients after COVID-19 based on disease activity.

Table 1. Risk of CVD, thrombotic and renal complications after COVID-19 in IBD patients on TNFi, non-TNFi, chronic steroids and immunomodulators compared to 5-ASA

Complication	IBD medication	(%)	OR	95% CI
	TNFi	5-ASA		
Composite	10.79	10.83	0.99	0.64 – 1.52
Cardiac complication	8.36	7.52	1.12	0.70 – 1.77
VTE	4.60	3.72	1.24	0.70 – 2.22
Ischemic stroke	4.87	4.15	1.18	0.68 – 2.04
PAD	2.33	1.56	1.5	0.67 – 3.38
AKI	2.86	3.17	0.89	0.46 – 1.74
Immunomodulators		5-ASA		
Composite	14.14	14.06	1	0.68 – 1.47
Cardiac complication	8.50	11.30	0.72	0.48 – 1.08
VTE	6.90	6.50	1.06	0.71 – 1.60
Ischemic stroke	6.45	4.81	1.36	0.87 – 2.12
PAD	2.48	2.13	1.17	0.62 – 2.18
AKI	5.93	4.74	1.26	0.80 – 1.98
	Non-TNFi	5-ASA		
Composite	12.50	12.50	1	0.55 – 1.79
Cardiac complication	8.15	11.62	0.67	0.36 – 1.24
VTE	4.74	3.86	1.24	0.54 – 2.81
Ischemic stroke	3.44	5.28	0.64	0.28 – 1.45
PAD	3.24	3.24	1	0.41 – 2.45
AKI	4.61	3.49	1.33	0.57 – 3.09
	Steroid	5-ASA		
Composite	17.4	14.9	1.20	0.91 – 1.58
Cardiac complication	12.9	12.4	1.04	0.80 – 1.137
VTE	7.6	7.2	1.05	0.79 – 1.40
Ischemic stroke	7.9	6.07	1.33	0.99 – 1.78
PAD	2.3	2.1	1.09	0.69 – 1.74
AKI	7.01	5.97	1.18	0.87 – 1.61

S771

Impact of Early Biologic Therapy in Real-World Cohort of Crohn's Disease Patients

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Introduction: Crohn's disease (CD) is characterized by transmural inflammation and ongoing inflammatory activity, which over time results in the accumulation of bowel damage, which may lead to complications such as strictures, fistulas/fissures, and abscesses, as well as disability. Optimally controlling inflammation early in the disease course of CD, during the 'window of opportunity,' may be the best way to change disease course. Recent evidence and clinical practice guidelines suggest that early biologic therapy is preferred in treating moderate to severe CD. Early use of biologic therapy and achievement of mucosal healing can contribute to disease course modification. We hypothesize that significantly more CD patients treated within 2 years of diagnosis will achieve clinical remission and have less CD-related complications than those treated 2 or more years after diagnosis.
Methods: We conducted a retrospective cohort study of CD patients treated within the Military Health System to assess the relationship of timing of initiation of biologic therapy with the control of CD. Data was collected from January 1, 2013 to December 30, 2020 to measure the course of patients' disease as determined by clinical, biochemical, radiologic, and endoscopic/histologic findings, with an assessment of clinical outcomes and complications to include CD-related emergency room visits, steroid use, hospitalizations, and surgeries.
Results: 343 patients with CD were identified, of which 184 were started on biologic therapy within 2 years of diagnosis, while 159 were started on biologic therapy 2 or more years after diagnosis. Patients who initiated biologic therapy within 2 years of diagnosis had significantly fewer CD-related complications ($p < 0.0001$) (Figure 1a). Evidence of perianal disease at diagnosis was predictive of an increased likelihood of CD-related complications (Figure 1b). Patients on monotherapy with thiopurines prior to biologic therapy were also more likely to experience CD-related complications (Figure 1c).
Conclusion: These findings demonstrate that earlier initiation of biologics (within 2 years of diagnosis) results in a lower probability of CD-related complications, including emergency room visits, steroid use, hospitalizations, and surgeries. This real-world study is one of the first to confirm prior clinical trial data on decreased complications in early initiation of biologic therapy in CD patients.

Figure 1a

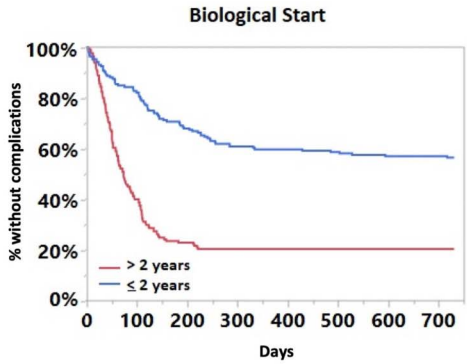


Figure 1b

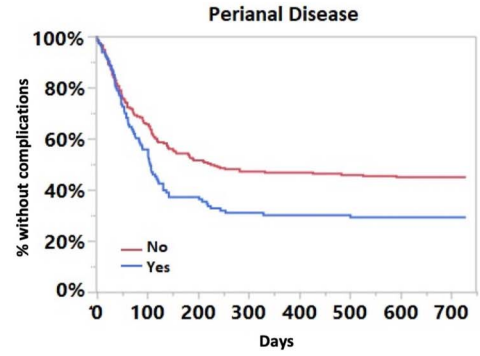
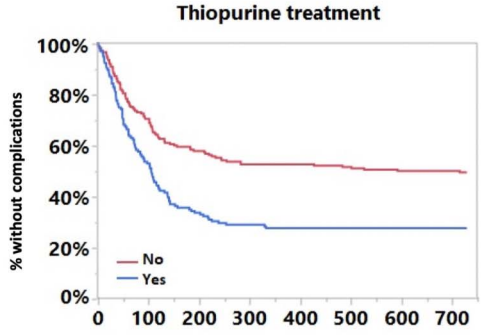


Figure 1c



[0771] **Figure 1.** Survival curves for complications with respect to timing of biologic start (1a), presence of perianal disease (1b) and thiopurine therapy prior to biologic stat (1c).

S772

Endoscopic Mucosal Resection for Colorectal Dysplasia in Inflammatory Bowel Disease

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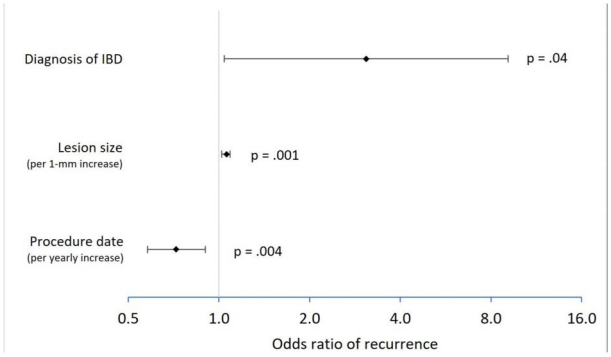
Introduction: Inflammatory bowel disease (IBD) is associated with an increased risk of colorectal cancer due to underlying chronic inflammation. Frequent surveillance colonoscopy is essential for early identification and removal of dysplastic lesions in this group. Many dysplastic lesions in IBD require advanced endoscopic resection due to size, morphology, or indistinct margins. The effectiveness of

endoscopic mucosal resection (EMR) for laterally spreading lesions is well documented in the general population; however, EMR continues to be challenging in patients with IBD. We aim to characterize outcomes of EMR for IBD-associated lesions compared to controls.

Methods: Retrospective data was collected from 2016 to 2021. CPT code 45390 was used to identify colonoscopies with EMR. ICD-10 codes K50-52 were used to identify patients with IBD. Adenomatous and dysplastic lesions of all sizes that were removed with EMR and underwent endoscopic surveillance were included. Data was recorded and stored in a REDCap database and analyzed using a mixed effects model for logistic regression with SAS Statistical Software.

Results: A total of 23 lesions in 14 patients with IBD and 187 lesions in 141 patients without IBD were included. Gender, ethnicity, age, lesion size and location, procedure date and duration, and number of lesions per patient were similar among both groups (Table). Piecemeal resection (as opposed to en bloc resection) was more common in the IBD group (91.3% vs. 42.1%, P< .001). Surgical resection was required for 2 IBD-associated lesions and 7 controls (8.7% vs. 3.9%, P=.27). Recurrence was detected and confirmed by histology in 7 IBD-associated lesions and 39 controls. In a mixed effects logistic regression model (Figure), IBD and lesion size were independently associated with recurrence (OR=3.08, 95% CI 1.04-9.13, P=.04; OR=1.06 per mm increase, 95% CI 1.02-1.09, P=.001). For each year that elapsed from the study start date to the procedure date, odds of recurrence decreased by 28% (OR=0.72, 95% CI 0.58-0.90, P=.004). In this model, 38.4% of IBD-associated lesions (95% CI 18.6-58.1) compared to 19.1% of controls (95% CI 13.8-24.5) recurred after EMR.

Conclusion: Recurrence of dysplastic lesions after EMR is more common in patients with IBD compared to controls. Most IBD-associated lesions are resected piecemeal. EMR in patients with IBD should be performed in expert centers with close endoscopic surveillance.



[0772] **Figure 1.** Mixed effects logistic regression model estimating odds of recurrence after EMR of adenomatous and dysplastic colorectal lesions. Diagnosis of IBD, lesion size, year of procedure, and degree of dysplasia were incorporated in the model. OR = 3.08 with a diagnosis of IBD (95% CI 1.04-9.13, p=.04). OR = 1.06 with each millimeter increase in lesion diameter (95% CI 1.02-1.09, p=.001). OR = 0.72 with each year from the study start date that elapsed prior to EMR (95% CI 0.58-0.90, P=.004).

Table 1. Characteristics of adenomatous and dysplastic colorectal lesions resected with EMR in patients with IBD compared to controls

	Total n = 210	Control n = 187	IBD n = 23	P-value
Lesion size (mm): mean (SD)	21.7 (12.2)	21.5 (12.4)	22.9 (11.3)	.62
Degree of dysplasia: n (%)				.81
adenoma/low-grade dysplasia	191 (91.0)	170 (90.9)	21 (91.3)	
high-grade dysplasia	14 (6.7)	12 (6.4)	2 (8.7)	
invasive carcinoma	5 (2.4)	5 (2.7)	0 (0.0)	
Location: n (%)				.36
ascending colon	69 (35.8)	61 (35.3)	8 (40.0)	
transverse colon	44 (22.8)	40 (23.1)	4 (20.0)	
cecum	29 (15.0)	28 (16.2)	1 (5.0)	
sigmoid colon	19 (9.8)	18 (10.4)	1 (5.0)	
descending colon	14 (7.3)	12 (6.9)	2 (10.0)	
rectum	11 (5.7)	9 (5.2)	2 (10.0)	
ileocecal valve	7 (3.6)	5 (2.9)	2 (10.0)	
Procedure time (min): mean (SD)	74.1 (29.9)	73.3 (30.4)	80.6 (25.5)	.27
En-bloc vs piecemeal resection: n (%)				< .001
en-bloc	108 (52.4)	106 (57.9)	2 (8.7)	
piecemeal	98 (47.6)	77 (42.1)	21 (91.3)	
Complications: n (%)	11 (5.2)	9 (4.8)	2 (8.7)	.34

S773

Effect of Mirikizumab on Bowel Urgency Clinically Meaningful Improvement and Remission: Results From the Phase 3 LUCENT Induction and Maintenance Studies

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Introduction: Bowel urgency (BU) was assessed in mirikizumab (miri) Phase 3 LUCENT studies in moderately-to-severely active ulcerative colitis (UC) using the validated Urgency Numeric Rating Scale (UNRS). UNRS measures BU severity in the past 24 hours from 0 (no urgency) to 10 (worst possible urgency). Psychometric evaluation of the UNRS showed Clinically Meaningful Improvement (CMI) is ≥3 point change; Remission is a score of 0 or 1. This analysis evaluated the proportions of patients in LUCENT studies achieving BU CMI and BU remission.

Methods: The modified intent-to-treat (mITT) population (patients receiving ≥1 dose of miri or placebo (PBO); N= 1281) was randomized at induction study baseline in a 3:1 ratio to IV doses of 300mg miri or PBO every 4 weeks (Q4W) during induction (W0, 4, and 8). Patients achieving Clinical Response, measured by Modified Mayo Score (MMS), to miri during induction were re-randomized at W0 of the maintenance study in a 2:1 ratio to subcutaneous (SC) 200mg miri or PBO Q4W through W40 (52 weeks of treatment). Patients recorded their UNRS score daily in an e-diary. Mean weekly UNRS scores were calculated from diary data if ≥4 days of data were available. Rates of BU CMI and BU remission in the miri v PBO groups were compared at W12 (induction) in the mITT population with a baseline UNRS score ≥3, and W52 (maintenance) among miri clinical responders at W12 with a baseline UNRS score ≥3. Cochran-Mantel-Haenszel tests with non-responder imputation for missing values were used for all treatment comparisons.

Results: Patient population: mean age 43 years, 60% male, disease duration 7 years; 63.0% left-sided colitis; 36.3% pancolitis; 46.7% moderate disease (MMS 4-6); 53.2% severe disease (MMS 7-9). Significantly higher proportions of miri versus PBO patients achieved BU CMI (48.7% v 32.2%) and BU remission (22.1% v 12.3%) at W12 (both p< 0.001; Table) in the induction study. Similarly, at W40 of maintenance, significantly greater proportion of miri patients achieved BU CMI (65.2% v 41.9%) and BU remission (42.9% v 25.0%) compared to PBO among miri induction responders (both p< 0.001; Table).

Conclusion: Miri had a highly significant and clinically meaningful benefit on reducing bowel urgency, one of the most disruptive UC symptoms. The Urgency Numeric Rating Scale usefully quantified the baseline level and change in bowel urgency after treatment across a spectrum of severity.

Table 1. Assessment Bowel Urgency Clinically Meaningful Improvement and Remission in Patients Treated with Mirikizumab v Placebo at Weeks 12 and 40

	Induction (W12 Analysis)			Maintenance (W40 Analysis)		
	300mg miri IV N= 868	PBO IV N= 294	p-value	200mg miri SC N= 365	PBO SC N= 179	p-value
Baseline bowel urgency W0 UNRS Score (Mean ± SD)	6.1 ± 2.2	6.2 ± 2.2	–	6.0 ± 2.2	6.2 ± 1.9	–
UNRS change from baseline (LSM ± SE)	-2.6 ± 0.083[a]	-1.63 ± 0.141[a]	p< 0.00001[a]	-3.8 ± 0.139[h]	-2.7± 0.202 [h]	p< 0.001[b, h]
Bowel urgency clinically meaningful improvement (N [%])[c]	395 [48.7%][e]	89 [32.2%][e]	p< 0.001[g]	219 [65.2%][f]	72 [41.9%][f]	p< 0.001[g]
Bowel Urgency Remission[d] (N [%])	179 [22.1%][e]	34 [12.3%][e]	P< 0.001[g]	144 [42.9%][f, h]	43 [25.0%][f, h]	P< 0.001[g,h]

Abbreviations: IV = intravenous; LSM = least squares mean; PBO = placebo; SC = subcutaneous; SD = standard deviation' UNRS = Urgency Numeric Rating Scale.
[a]Results previously disclosed at ECCO 2022; D'Haens et al. J Crohn's Colitis. 2022;16(Supplement 1): i028-i029.
[b]Treatment comparison is from a mixed model for repeated measures model that contains treatment, baseline value, visit, interaction of baseline value by visit, interaction of treatment by visit, and stratification factors.
[c]Bowel urgency clinically meaningful improvement is defined as a reduction in the UNRS of ≥3 points.
[d]Bowel urgency remission is an UNRS score of '0' or '1'.
[e]Comparisons between miri and PBO at W12 are shown for patients with a baseline UNRS score ≥3; N=811 for 300mg miri and N= 276 for PBO.
[f]Comparisons between miri and PBO at W40 are shown for miri induction responders with a UNRS score ≥3 at baseline; N= 336 for 200mg miri and N=172 for PBO.
[g]Cochran-Mantel-Haenszel tests with non-responder imputation were used for treatment comparisons.
[h]Results previously disclosed at DDW 2022.

S774

Pharmacokinetics, Safety, and Tolerability of Etrasimod: Results From a Phase 1 Drug-Drug Interaction Study in Healthy Volunteers

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Introduction: Etrasimod (ETR), is an investigational, once-daily, oral, selective sphingosine 1-phosphate receptor 1,4,5 modulator in development for the treatment of several immune-mediated inflammatory disorders. ETR has the potential for drug-drug interaction with CYP2C8, CYP2C9, and CYP3A4 when coadministered with inhibitors or inducers of these enzymes. This open-label Phase 1 study evaluated the PK and safety of ETR in the presence of fluconazole, gemfibrozil, or rifampin.
Methods: Fifty-six healthy volunteers (18-55 years) were assigned to 1 of 3 treatment groups, each with 2 dosing periods separated by a 7-day washout. On Day 1 (Period 1), Groups A and B received a single dose of ETR 1mg whereas Group C received a single dose of ETR 2mg. From Days 8–22 (Period 2), Groups A and B received fluconazole once daily (QD) (400mg on Day 8; 200mg on Days 9–22) and gemfibrozil 600mg twice daily, respectively, and a single dose of ETR 1mg on Day 12, whereas Group C received rifampin 600mg QD and a single dose of ETR 2mg on Day 15. Primary endpoints were plasma C_{max}, $AUC_{0\text{-}168h}$, and $AUC_{0\text{-}\infty}$ of ETR in the presence and absence of fluconazole, gemfibrozil, or rifampin. Log-transformed primary PK parameters for ETR were compared using analysis of variance with treatment as fixed effect and participant as random effect.
Results: In the presence of fluconazole or gemfibrozil, there was little impact on ETR C_{max}, but $AUC_{0\text{-}168h}$ and $AUC_{0\text{-}\infty}$ were mildly-to-moderately increased (Table). Geometric mean $t_{1/2}$ of ETR increased from 42 to 87 hours in the presence of fluconazole and from 45 to 70 hours in the presence of gemfibrozil. When administered in the presence vs absence of rifampin, ETR C_{max} only slightly increased while $AUC_{0\text{-}168h}$ and $AUC_{0\text{-}\infty}$ moderately decreased. Geometric mean $t_{1/2}$ of ETR decreased by ~50% in the presence of rifampin. All treatments were generally well tolerated. All treatment-emergent AEs were mild or moderate. One participant discontinued the study due to AEs. No abnormalities were found in laboratory parameters, vital signs, or 12-lead electrocardiograms.
Conclusion: These results are consistent with CYP2C8, CYP2C9, and CYP3A4 being involved in ETR metabolism with no single enzyme appearing to dominate its elimination. The involvement of multiple CYP isoforms reduces the likelihood of ETR having a clinically relevant drug interaction, particularly when only a single CYP isoform is strongly or moderately inhibited/induced by a coadministered drug.

Table 1. Statistical Comparison of Etrasimod Plasma Exposure Measures in the Presence and Absence of Fluconazole, Gemfibrozil, or Rifampin

Analyte	C_{max} (ng/mL) GLSMR (90% CI)	$AUC_{0\text{-}168h}$ (ng*h/mL) GLSMR (90% CI)	$AUC_{0\text{-}\infty}$ (ng*h/mL) GLSMR (90% CI)
Group A (n = 18): [Etrasimod + Fluconazole[a]] / [Etrasimod]			
Etrasimod	1.12 (1.09–1.16)	1.62 (1.52–1.72)	1.84 (1.71–1.99)
Group B (n = 18): [Etrasimod + Gemfibrozil[b]] / [Etrasimod]			
Etrasimod	1.12 (1.06–1.19)	1.27 (1.20–1.35)	1.36 (1.26–1.46)
Group C (n = 18): [Etrasimod + Rifampin[c]] / [Etrasimod]			
Etrasimod	1.24 (0.82–1.88)	0.53 (0.49–0.56)	0.51 (0.47–0.54)

$AUC_{0\text{-}\infty}$, area under the plasma concentration-time curve from time 0 to infinity; $AUC_{0\text{-}168h}$, AUC from time 0 to 168 hours; CI, confidence interval; C_{max}, maximum plasma drug concentration; GLSMR, geometric least squares mean ratio.
[a]Moderate CYP2C9 and CYP3A4 inhibitor; strong CYP2C19 inhibitor.
[b]Strong CYP2C8 inhibitor.
[c]Moderate CYP2C8 and CYP2C9 inducer; strong CYP3A4 and CYP219 inducer.

S775

Major Cardiovascular Adverse Events by Baseline Cardiovascular Risk Stratification in Patients With Ulcerative Colitis Treated With Tofacitinib: Data From the OCTAVE Clinical Program

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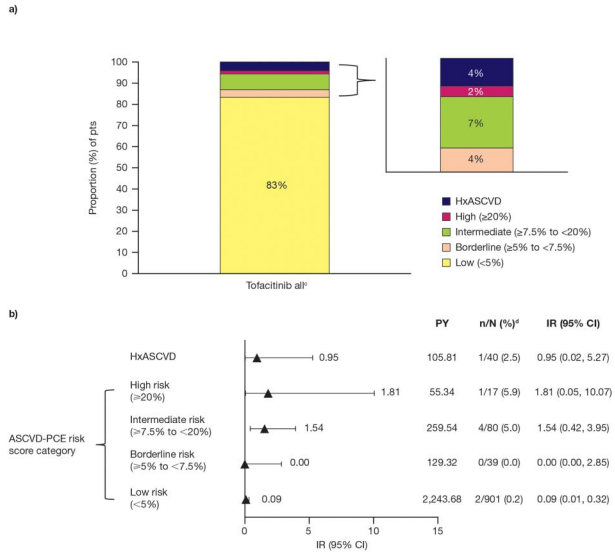
Introduction: Tofacitinib is an oral small molecule JAK inhibitor for the treatment of UC. Results from ORAL Surveillance, a post-authorization safety study in patients (pts) with RA aged ≥ 50 years with ≥ 1 additional cardiovascular (CV) risk factor indicated increased risk of major adverse CV events (MACE) and malignancies (excluding NMSC) with tofacitinib vs tumor necrosis factor inhibitors. Pts with IBD are at increased risk of atherosclerotic CV disease (ASCVD; coronary artery disease, cerebrovascular disease, or peripheral artery disease) vs the general population. The ASCVD-pooled cohort equations calculator, a validated risk-prediction tool recommended by the ACC, considers traditional CV risk factors to estimate 10-year risk of primary ASCVD. This study evaluated MACE occurrence stratified by baseline CV risk in the tofacitinib OCTAVE clinical program.

Methods: 1,157 pts (median treatment duration 623 [range 1–2,850] days; 2,814.4 pt-years [PY] of exposure) who received tofacitinib 5 or 10 mg BID in a Phase(P)2 induction study (NCT00787202) and P3 studies (OCTAVE Induction 1&2 [NCT01465763; NCT01458951], OCTAVE Sustain [NCT01458574], and OCTAVE Open [NCT01470612]) were included. Proportions and incidence rates (IRs; unique pts with events / 100 PY of exposure) were evaluated for MACE. MACE IRs were stratified by baseline (first tofacitinib exposure) CV risk profile: first by history of ASCVD (HxASCVD), then pts without HxASCVD were categorized by 10-year ASCVD risk.

Results: Of 1,109 pts in which baseline CV risk was assessed, 4% had a HxASCVD, and most (87%) pts without a HxASCVD had a low / borderline risk of ASCVD (Figure). 8 pts had an adjudicated MACE; 1 event occurred in a pt with a HxASCVD, 5 in pts in intermediate / high ASCVD risk categories, and 2 in pts in the low ASCVD risk category. MACE IR in pts with a HxASCVD was 0.95 (0.02, 5.27) and IRs in pts without a HxASCVD by ASCVD risk were: high 1.81 (0.05, 10.07); intermediate 1.54 (0.42, 3.95); borderline 0.00 (0.00, 2.85); and low 0.09 (0.01, 0.32). 7 pts with MACE had a medical history of CV risk factors, and 7 were receiving statins (Table).

Conclusion: In the tofacitinib OCTAVE clinical program, MACE were infrequent. Most pts had a low baseline ASCVD risk. This analysis highlights a potential association between baseline CV risk and MACE incidence in pts with UC treated with tofacitinib. Interpretation of these data was limited by the low number of events and short median treatment duration vs assessment of long-latency events.



[0775] **Figure 1.** a) Proportion of patients in each baseline CV risk category[a], and b) IRs (unique patients with events/100 PY of exposure) for MACE baseline CV risk category in the tofacitinib UC clinical trial program[b]. MACE were adjudicated by an independent review committee and defined as any myocardial infarction, stroke, or CV death. HxASCVD was defined as a history of any of coronary artery disease (including myocardial infarction), cerebrovascular disease (including stroke), or peripheral artery disease [a] Patients without a HxASCVD were categorized according to their 10-year risk of ASCVD, per the ASCVD PCE calculator, as recommended by the ACC. Baseline was defined as first tofacitinib exposure. [b] Includes data from the P2 induction study (NCT00787202) and P3 studies (OCTAVE Induction 1&2 [NCT01465763; NCT01458951], OCTAVE Sustain [NCT01458574], and OCTAVE Open [NCT01470612]) from patients who received at least one dose of tofacitinib 5 mg or 10 mg twice daily [c] Includes patients with a HxASCVD and patients for which baseline CV risk could be determined (N=1,109; 48 pts had a missing score due to missing components). [d] Excludes data from the Phase 2 study. Events that occurred >28 days after the last dose of the study drug were excluded. ACC, American College of Cardiology; ASCVD, atherosclerotic CV disease; ASCVD-PCE, ASCVD-pooled cohort equations; CI, confidence interval; CV, cardiovascular; HxASCVD, history of ASCVD; IR, incidence rate (unique patients with events/100 PY of exposure); MACE, major adverse CV events; N, number of patients with a HxASCVD or non-missing baseline ASCVD score; n, number of unique patients with a MACE; P, Phase; PY, patient-years; UC, ulcerative colitis

Table 1. Demographics and clinical characteristics of pts with MACE in the tofacitinib UC clinical program

MACE	Adjudicated event preferred term	Baseline CV risk category (ASCVD risk score, %)[a]	CV risk category prior to first MACE (ASCVD risk score, %)[b]	Induction baseline age (years) and gender	Day of onset[c] and predominant to facitinib dose[d]	Smoking status and CV risk factors	Prior and concomitant CV medication and LLA	Induction baseline serum lipid concen-trations (mg/dL)[e]	Serum lipid concentrations at last recorded study time point (mg/dL)[e]
Myocardial infarction	Acute coronary syndrome	HxASCVD	HxASCVD	66 Male	Day 28[f] 5 mg BID	Ex-smoker Medical history of myocardial infarction, angina pectoris, arrhythmia, hyper-cholesterolemia and hypertension	CV medication: acetylsalicylic acid, perindopril and verapamil LLA: rosuvastatin	TC: 192 HDL-c: 112 LDL-c: 59 TG: 105	TC: 151 HDL-c: 65 LDL-c: 70 TG: 82
Myocardial infarction	Acute myocardial infarction	Inter-mediate (9.6)	Inter-mediate (14.3)	64 Male	Day 1,540[h] 5 mg BID	Non-smoker None reported	CV medication: acetylsalicylic acid and perindopril LLA: atorvastatin	TC: 167 HDL-c:59 LDL-c: 92 TG: 80	TC: 151 HDL-c: 51 LDL-c: 82 TG: 88

Table 1. (*continued*)

MACE	Adjudicated event preferred term	Baseline CV risk category (ASCVD risk score, %)[a]	CV risk category prior to first MACE (ASCVD risk score, %)[b]	Induction baseline age (years) and gender	Day of onset[c] and predominant to facitinib dose[d]	Smoking status and CV risk factors	Prior and concomitant CV medication and LLA	Induction baseline serum lipid concentrations (mg/dL)[e]	Serum lipid concentrations at last recorded study time point (mg/dL)[e]
Myocardial infarction	Myocardial infarction	Inter-mediate (17.9)	Inter-mediate (17.9)	74 Male	Day 142[g] 5 mg BID	Ex-smoker Medical history of hyperlipidemia, hypertension and deep vein thrombosis	CV medication: acetylsalicylic acid and warfarin LLA: simvastatin	TC: 161 HDL-c: 63 LDL-c: 71 TG: 134	TC: 172 HDL-c: 44 LDL-c: 96 TG: 159
CV death	Aortic dissection	Low (1.4)	Low (1.4)	39 Male	Day 31[f] 10 mg BID	Non-smoker Medical history of hyperlipidemia	None reported	TC: 309 HDL-c: 80 LDL-c: 189 TG: 194	Not assessed
CV death	Cardiac arrest	Inter-mediate (15.2)	High (25.7)	67 Male	Day 1,725[h] 10 mg BID	Ex-smoker Medical history of dyslipidemia and pulmonary embolism	CV medication: none reported LLA: atorvastatin	TC: 172 HDL-c: 39 LDL-c: 103 TG: 150	TC: 214 HDL-c: 54 LDL-c: 128 TG: 159
Stroke	Hemorrhagic stroke	Low (4.2)	Borderline (5.5)	55 Female	Day 148[g] 10 mg BID	Non-smoker Medical history of hypertension, hyper-cholesterolemia and diabetes mellitus	CV medication: irbesartan LLA: atorvastatin	TC: 183 HDL-c: 63 LDL-c: 94 TG: 132	TC: 205 HDL-c: 71 LDL-c: 111 TG: 117
Stroke	Cerebro-vascular accident	High (36.3)	High (49.6)	56 Male	Day 857[h] 10 mg BID	Smoker Medical history of hypertension and diabetes mellitus	CV medication: amlodipine and enalapril LLA: atorvastatin	TC: 230 HDL-c: 39 LDL-c: 132 TG: 297	TC: 181 HDL-c: 56 LDL-c: 73 TG: 258
Stroke	Cerebellar hemorrhage	Inter-mediate (9.9)	Inter-mediate (14.0)	55 Male	Day 1,438[h] 5 mg BID	Non-smoker Medical history of left ventricular hypertrophy and hypertension	CV medication: amlodipine LLA: atorvastatin	TC: 216 HDL-c: 34 LDL-c: 150 TG: 161	TC: 282 HDL-c: 51 LDL-c: 191 TG: 194

MACE were adjudicated by an independent review committee and defined as any myocardial infarction, stroke, or CV death.
HxASCVD was defined as a history of any of coronary artery disease (including myocardial infarction), cerebrovascular disease (including stroke), or peripheral artery disease.
[a]Pts without HxASCVD were categorized according to their 10-year risk of ASCVD, per the ASCVD-PCE risk calculator (as recommended by the ACC). Baseline was defined as first tofacitinib exposure.
[b]Latest CV risk score prior to MACE.
[c]Study onset day in relation to first day of tofacitinib exposure.
[d]Pts were categorized based on the average daily dose of tofacitinib (placebo exposure was not included): predominant dose tofacitinib 5 mg BID (average total daily dose < 15 mg) and predominant dose tofacitinib 10 mg BID (average total daily dose ≥ 15 mg).
[e]Reference ranges: TC, 130–200 mg/dL; HDL-c, 40–80 mg/dL; LDL-c, 0–130 mg/dL; TG, 45–250 mg/dL.
[f]Event onset during OCTAVE Induction 1 or 2.
[g]Event onset during OCTAVE Sustain.
[h]Event onset during OCTAVE Open.
ACC, American College of Cardiology; ASCVD, atherosclerotic CV disease; ASCVD-PCE, ASCVD-pooled cohort equations; BID, twice daily; CV, cardiovascular; HDL-c, high-density lipoprotein-cholesterol; HxASCVD, history of ASCVD; LDL-c, low-density lipoprotein-cholesterol; LLA, lipid-lowering agent; MACE, major adverse cardiovascular events; TC, total cholesterol; TG, triglycerides; UC, ulcerative colitis.

S776

Rates of Melanoma and Non-Melanoma Skin Cancers Among IBD Patients Treated With Non-Anti-TNF Advanced Therapies

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Introduction: Use of immunosuppressants in inflammatory bowel disease (IBD) patients has been shown to increase the risk of skin cancers. However, there is limited data on risk of skin cancer among IBD patients who are on non-antiTNF advanced therapies. Using a large database, we sought to describe the rates of melanoma and non-melanoma skin cancers among IBD patients based on medications used.
Methods: We queried a multi-institutional database (Explorys Inc, Cleveland, OH, USA), an aggregate of electronic health record data from 26 US healthcare systems was surveyed. A cohort of patients with a Systematized Nomenclature of Medicine-Clinical Terms of inflammatory bowel disease between 2017-2021 was identified. We then identified cohorts of IBD patients based on medications prescribed. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS version 25, IBM Corp), multivariate analysis was used to adjust for several factors including prescribed medications. For all analyses, a 2-sided P value of < 0.05 was considered statistically significant.
Results: Of the 34,277,840 individuals in the database, 142,890 (0.42%) and 165,960 (0.48%) had a diagnosis of ulcerative colitis (UC) and Crohn's disease (CD) respectively. IBD patients were mostly adults (63.8% vs 70.%) adults, females (60.4% vs 61.1%), and Caucasian (76.2% vs 74.1%) for UC and CD respectively. Among IBD patients who were not previously treated with antiTNFs/immunomodulators, rates of SCC,BCC, and melanoma were 1.3%, 2.6%, and 1.3% for UC treated with ustekinumab, and 1.5%, 2.5%, and 1.5% for UC/vedolizumab and 2.2%, 4.3%, and 1.1% for UC/tofacitinib respectively. In comparison, rates were 1.2%, 2.4%, and 1.0% for CD/ustekinumab and 1.7%, 2.4%, and 1.4% for CD/vedolizumab respectively (Table 1). In the multivariate model, IBD patients were two times higher risk for SCC and melanoma (Table 2).
Conclusion: In this large database, we found a higher rates of melanoma and non-melanoma skin cancers among IBD patients treated with Non-AntiTNF Advanced Therapies. Further studies are required to validate these findings and increase attention to adequately screening for skin cancers and make dermatology referral while taking care of IBD patients.

Table 1: Rates of melanoma and non-melanoma skin cancers among IBD patients based on medications

	Actinic keratosis	SCC	BCC	Malignant melanoma
General population	2.3%	0.5%	1.0%	0.4%
Ulcerative colitis				
Anti-TNFs without IM	8.1%	1.0%	3.7%	1.8%
Anti-TNFs with IM	4.5%	1.7%	3.0%	1.4%
Ustekinumab	5.2%	1.3%	2.6%	1.3%
Vedolizumab	5.5%	1.5%	2.5%	1.5%
Tofacitinib	6.5%	2.2%	4.3%	1.1%
Crohn's disease				
Anti-TNFs without IM	4.5%	1.4%	2.1%	0.9%
Anti-TNFs with IM	6.2%	1.9%	2.7%	1.0%
Ustekinumab	4.6%	1.2%	2.4%	1.0%
Vedolizumab	5.4%	1.7%	2.4%	1.4%

Table 2: Risk of skin cancers among IBD patients on biologics using multivariate analysis

	Ulcerative colitis		Crohn's disease	
	OR	95% CI	OR	95% CI
Squamous Cell Cancer				
IM	3.41	3.26-3.56	3.34	3.19-3.49
Anti-TNFs	1.67	1.60-1.75	2.19	2.09-2.29
Ustekinumab	2.35	2.09-2.64	2.02	1.80-2.27
Vedolizumab	2.05	1.81-2.32	1.77	1.56-2.00
Basal Cell Cancer				
IM	1.94	1.86-2.02	1.8	1.72-1.88
Anti-TNFs	1.62	1.57-1.68	2.06	1.99-2.14
Ustekinumab	1.98	1.80-2.18	1.74	1.58-1.91
Vedolizumab	1.7	1.53-1.89	1.53	1.38-1.70
Multiple Myeloma				
IM	1.95	1.84-2.08	1.81	1.71-1.93
Anti-TNFs	1.62	1.54-1.70	1.93	1.84-2.03
Ustekinumab	2.18	1.92-2.47	2	1.77-2.27
Vedolizumab	2.53	2.23-2.87	2.33	2.06-2.65

[0776] **Figure 1.** Rates of melanoma and non-melanoma skin cancers among IBD patients based on medications

S777

Benefit–Risk Assessment of Upadacitinib Treatment in Patients With Moderately to Severely Active Ulcerative Colitis

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Introduction: Efficacy and safety of upadacitinib(UPA) as induction and maintenance therapy in patients with moderate to severe active ulcerative colitis have been demonstrated in a Phase 3 clinical trial program.[1–3]

Methods: Patients with clinical response(per Adapted Mayo score) after 8 weeks (wks) of UPA 45mg once daily(QD) induction treatment in U-ACHIEVE Induction(NCT02819635) or U-ACCOMPLISH(NCT03653026) were re-randomized to U-ACHIEVE Maintenance(NTC02819635) receiving UPA 15mg QD, UPA 30mg QD, or placebo(PBO) maintenance therapy. We present 52wk efficacy and safety benefit–risk assessment of UPA 15mg and UPA 30mg vs PBO. For efficacy outcomes, point estimates and 95% confidence intervals(CI) of PBO-adjusted treatment effect were calculated. For risk analysis, exposure-adjusted event rates(events per 100 patient-years [E/100 PY]) of selected adverse events of special interest were evaluated.

Results: Overall, 681 patients were analyzed for efficacy(UPA 15mg, 225; UPA 30mg, 233; PBO, 223). For primary endpoint of clinical remission at wk 52, point estimates of PBO-adjusted treatment effect were 30.1%(95% CI: 22.7, 37.4) with UPA 15mg and 42.9%(35.4, 50.4) with UPA 30mg($p< 0.001$ for both; Table). Significant differences were observed across secondary endpoints for UPA doses vs PBO(all $p< 0.001$; **Table**). Rates of serious infections were 5.9 E/100 PY with PBO vs 5.0 and 3.2 for UPA 15mg and UPA 30mg, respectively. No events of herpes zoster were reported with PBO, while rates with UPA 15mg and UPA 30mg were 6.0 and 7.3 E/100 PY, respectively. Rates of malignancy excluding non-melanoma skin cancer were 0.7 E/100 PY with PBO vs 0.5 and 0.9 with UPA 15mg and UPA 30mg, respectively; rates of non-melanoma skin cancer were 1.4 E/100 PY with UPA 30mg, with no cases reported with UPA 15mg or PBO. Adjudicated venous thromboembolic events were low in UPA groups and no cases were reported with PBO; adjudicated major adverse cardiovascular events were low with PBO and UPA 30mg, and none with UPA 15mg (Table).

Conclusion: Response rates were significantly greater with UPA 15mg and UPA 30mg versus PBO across endpoints assessed. UPA doses were well tolerated. Rates of herpes zoster and creatine phosphokinase elevation, known safety signals of JAK inhibitors,[4] were dose-dependent. The data suggest that UPA 15mg and UPA 30mg QD have a favorable benefit–risk profile after 52wks maintenance therapy. The safety of UPA continues to be monitored in long-term extension study.

Table 1.

Primary and key secondary endpoints at Week 52	UPA 15 mg QD – PBO response rate difference, % (95% CI)[a]	UPA 30 mg QD – PBO response rate difference, % (95% CI)[a]
Clinical remission[b]	30.1 (22.7, 37.4)***	42.9 (35.4, 50.4)***
Endoscopic improvement[c]	34.4 (26.7, 42.1)***	49.0 (41.4, 56.7)***
Maintenance of clinical remission[d]	34.9 (21.2, 48.5)***	46.9 (34.0, 59.8)***
Corticosteroid-free clinical remission[e]	33.7 (20.0, 47.3)***	45.5 (32.6, 58.5)***
Maintenance of endoscopic improvement[f]	42.2 (30.4, 53.9)***	51.5 (40.9, 62.1)***
Endoscopic remission[g]	18.6 (12.2, 25.0)***	21.9 (15.4, 28.5)***
Histologic-endoscopic mucosal improvement[h]	28.5 (21.1, 35.9)***	43.8 (36.1, 51.5)***
Mucosal healing[i]	13.5 (7.8, 19.3)***	17.2 (11.2, 23.3)***

Selected adverse events of special interest[j]	PBO, E (E/100 PY) (N=245)	UPA 15 mg QD, E (E/100 PY) (N=250)	UPA 30 mg QD, E (E/100 PY) (N=251)
Serious infection	8 (5.9)	10 (5.0)	7 (3.2)
Herpes zoster	0	12 (6.0)	16 (7.3)
CPK elevation	5 (3.7)	16 (8.0)	22 (10.1)
Malignancy (excluding NMSC)	1 (0.7)	1 (0.5)	2 (0.9)
NMSC	0	0	3 (1.4)
Adjudicated MACE	1 (0.7)	0	1 (0.5)
Adjudicated VTE	0	2 (1.0)	2 (0.9)

***p< 0.001.
[a]The efficacy analysis was based on the ITT population. Results are based on non-responder imputation incorporating multiple imputation to handle missing data due to COVID-19. The point estimate and 95% CI for treatment difference are based on Cochran–Mantel–Haenszel tests adjusted for strata (corticosteroid use at Week 0 [yes or no], clinical remission status at Week 0 [yes or no], biologic-IR status at baseline [biologic-IR or non-biologic-IR]).
[b]Stool frequency subscore ≤1 and not greater than baseline (of induction), RBS=0, and ES ≤1.
[c]ES ≤1.
[d]Among patients with clinical remission at the end of the induction therapy.
[e]Clinical remission at Week 52 and corticosteroid free for ≥90 days prior to Week 52 among patients with clinical remission at the end of the induction therapy.
[f]Endoscopic improvement at Week 52 among patients with endoscopic improvement at the end of the induction therapy.
[g]ES=0.
[h]ES ≤1 and Geboes score ≤3.1.
[i]ES=0 and Geboes score < 2.
[j]The safety analysis included all patients who received ≥1 dose of study therapy (ITT population plus patients who received up to 44 weeks' maintenance therapy under earlier versions of protocol amendments).
CI, confidence interval; CPK, creatine phosphokinase; E, event; ES, endoscopic subscore; IR, inadequate responder; ITT, intention-to-treat; MACE, major adverse cardiovascular event; NMSC, non-melanoma skin cancer; QD, once daily; PBO, placebo; PY, patient-years; RBS, rectal bleeding subscore; UPA, upadacitinib; VTE, venous thromboembolic event.

S778

Racial and Ethnic Diversity in Inflammatory Bowel Disease Randomized Clinical Trials

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Introduction: The prevalence of Inflammatory Bowel Disease (IBD) in non-White populations may be higher than previously thought. However, inclusion of patients from underrepresented backgrounds in IBD randomized clinical trials (RCTs) is not well characterized. To address this, we conducted a systematic review of inclusions of race and ethnicity in Phase 2, 3 and 4 RCTs investigating biologic treatments in IBD.
Methods: National and international trials were included if they investigated a biological treatment against at least one other unique treatment arm in patients with Crohn's Disease (CD), Ulcerative Colitis (UC) or both. Studies with less than fifty patients with IBD were excluded.
Results: Of 111 RCTs that met inclusion criteria, 48.6% of studies did not include information on the racial breakdown of participants and 29.7% included demographics for one race (28 trials reported only White patients, 5 only Asian patients). Multiple racial groups were represented in 22.1% of RCTs. Of these 24 studies, 100% reported White patients, 83.3% reported Black patients, 83.3% reported Asian patients, 16.6% reported Native or Pacific Island patients and 70.8% included patients defined as "Other" (most cases concurrent with reporting of Asian and Black patients). Across studies with reported racial demographics, participants were 89.1% White, 2.6% Black, 7.6% Asian, 0.7% Native or Pacific Islander (NA/PI) and 2.0% "Other". Ethnicity was reported in 4.5% of RCTs, in which 1.3% of participants identified as Hispanic or Latino. There was a significant temporal decrease in the proportion of White participants (RR: 0.96 CI 0.92 - 0.99). There were no significant temporal trends in the participation of Black, Asian, NA/PI, "Other" and Hispanic or Latino patients. (Table)
Conclusion: There is limited inclusion of race and ethnicity in RCTs. When documentation is present, it shows marginalized groups are underrepresented. Ongoing and future RCTs have an opportunity to 1) characterize the racial and ethnic demographics of participants and 2) increase recruitment of participants from underrepresented backgrounds to enhance the generalizability of RCT findings.

Table 1. **Percent and number of studies reporting racial and ethnic demographics, split by time period and IBD subtype**

Races Reported	Percent of Studies (n=111)	Percent Pre-2010 (n=61)	Percent Post-2010 (n=50)	Crohn's Disease (n=67)	Ulcerative Colitis (n=45)
None	48.6 (54)	54.1 (33)	42.0 (21)	53.7 (36)	40.0 (18)
One	29.7 (33)	27.9 (17)	32.0 (16)	23.9 (16)	37.8 (17)
Asian Only	4.5 (5)	1.6 (1)	8.0 (4)	1.5 (1)	8.9 (4)
White Only	26.2 (29)	22.8 (14)	30.6 (15)	22.4 (15)	28.9 (13)
Multiple Races	21.7 (24)	18.0 (11)	26.0 (13)	22.4 (15)	37.8 (17)
Two	3.6 (4)	6.6 (4)	0 (0)	1.5 (1)	6.7 (3)
Three	3.6 (4)	3.3 (2)	4.0 (2)	4.5 (3)	2.2 (1)
Four	13.5 (15)	8.2 (5)	20.0 (10)	13.4 (9)	13.3 (6)
Five	0.9 (1)	0 (0)	2.0 (1)	3.0 (2)	0 (0)
Average Racial Breakdown					

Table 1. (*continued*)

Races Reported	Percent of Studies (n=111)	Percent Pre-2010 (n=61)	Percent Post-2010 (n=50)	Crohn's Disease (n=67)	Ulcerative Colitis (n=45)
White	89.1	90.6	87.6	90.3	86.6
Black	2.6	2.7	2.4	5.2	2.1
Asian	7.6	8.4	7.0	5.6	9.9
NA/PI	0.7	0	0.6	0.5	0.6
Other	2.0	2.3	1.8	1.6	2.6
Reports Ethnicity	4.5 (5)	4.9 (3)	4.0 (2)	4.5 (3)	4.4 (2)
Average Hispanic/Latino	1.3	0.5	3.4	1.1	1.7

S779

Efficacy of Pneumococcal Vaccine in Patients With Inflammatory Bowel Disease - A Propensity-Matched Analysis

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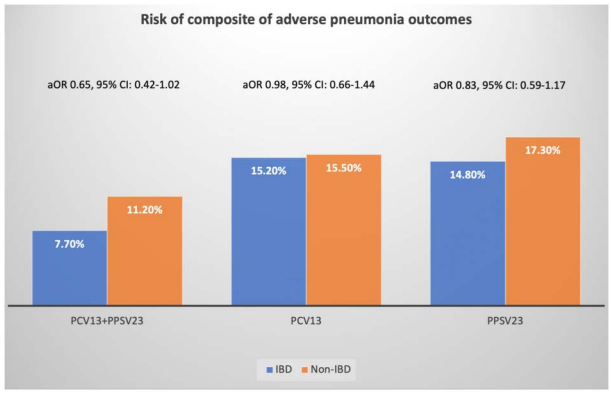
Introduction: Studies in patients with inflammatory bowel disease (IBD) have shown decreased immunogenicity from vaccines compared to the general population. Patients with IBD should receive the 13-valent pneumococcal conjugate vaccine (PCV13) followed by the 23-valent pneumococcal polysaccharide vaccine (PPSV23) after 8 weeks and a single booster of PPSV23, 5 years later. The primary aim of our research is to assess the efficacy of the pneumococcal vaccines in IBD patients.
Methods: A retrospective cohort study was conducted using TriNetX, a multi-institutional database of more than 70 million patients from 49 healthcare organizations in the USA. The risk of pneumococcal disease (PD) in IBD patients who received PCV13, PPS23, PCV13 + PPSV23 and booster dose (PCV13 + two doses of PPSV23) was compared to unvaccinated IBD patients. 1:1 propensity-matching for age, gender, ethnicity, and known risk factors for pneumococcal disease was performed. Adverse outcomes of pneumonia assessed were hospitalization, risk of ICU admission, and endotracheal intubation in patients within 30 days and 90-day mortality. Adjusted odds ratios (aOR) with 95% confidence interval (CI) were calculated to express the risk of each adverse event.
Results: A total of 185,564 patients with IBD were identified in the dataset. A total of 20,850 (11.5%) had received either PCV13, PPSV23 or a combination of PCV13 and PPSV23. The risk of PD was decreased in IBD cohort with PCV13 + PPSV23 (aOR 0.8, 95% CI: 0.71-0.92), PPSV23 (0.85, 0.75-0.96) and booster dose (0.36, 0.22-0.57) compared to the unvaccinated cohort (Table). The vaccinated IBD cohort had a decreased risk for adverse pneumonia outcomes compared to unvaccinated cohort (Table). There was no difference in the risk of PD between vaccinated IBD and non-IBD cohort after PCV13+PPSV23 (aOR 0.95, 95% CI: 0.83-1.09), PCV13 (1.06, 0.92-1.23) and PPSV23 (1.01, 0.89-1.15). The risk of adverse pneumonia outcomes was also similar across all vaccination groups. Patients with IBD on immunomodulator therapy had a higher risk of PD than those on 5-ASA therapy (aOR 1.96, 95% CI; 1.51-2.55) however there was no difference in risk in patients on TNFi or non-TNFi biologic agents.
Conclusion: In conclusion, both PCV13 & PPSV23 confer protection to patients with IBD and protect them from severe disease-related outcomes. Immunomodulator therapy, despite vaccination status, confers a higher risk of developing pneumococcal disease.



[0779] **Figure 1.** Risk of composite of adverse pneumonia outcomes between IBD and non-IBD cohort based on type of pneumococcal vaccine. Composite outcomes include hospitalization, ICU care, intubation and 30-day mortality.

Table 1. **Risk of pneumonia related adverse events in patients with IBD who received a pneumococcal vaccine compared to unvaccinated patients with IBD**

Outcome	Vaccine (%)	Unvaccinated (%)	OR	95% CI
	PPSV23 + PCV13			
Composite	7.2	14.2	0.46	0.30 – 0.71
Hospitalization	25.4	35.4	0.62	0.47 – 0.82
ICU care	5.1	9.9	0.49	0.30 – 0.81
Intubation	2.8	5.5	0.5	0.26 – 0.97
90-day mortality	3.7	9.3	0.37	0.21 – 0.66
	PCV13			
Composite	2.5	11.9	0.19	0.09 – 0.38
Hospitalization	8.1	26.6	0.25	0.16 – 0.38
ICU care	2.5	8.6	0.27	0.13 – 0.56
Intubation	2.5	3.3	0.76	0.33 – 1.76
90-day mortality	0	7.1	N/A	N/A
	PPSV23			

Table 1. (*continued*)

Outcome	Vaccine (%)	Unvaccinated (%)	OR	95% CI
Composite	2.2	13	0.15	0.08 – 0.29
Hospitalization	14.4	28.2	0.42	0.31 – 0.58
ICU care	2.0	9.7	0.19	0.09 – 0.38
Intubation	2.0	5.6	0.34	0.16 – 0.71
90-day mortality	2.0	6.5	0.29	0.14 – 0.61

S780

Impact of Ozanimod on Fecal Calprotectin Levels and the Association With Efficacy in Patients With Moderately to Severely Active Ulcerative Colitis: Results From the Phase 3 True North Study

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Introduction: Ozanimod (OZA) is approved in the USA and EU for the treatment of moderate/severe ulcerative colitis (UC). OZA demonstrated efficacy in the phase 3 True North (TN) trial in patients (pts) with moderate/severe UC (NCT02435992). Infiltration of neutrophils in intestinal mucosa contributes to inflammation in inflammatory bowel diseases. Calprotectin, which is released by neutrophils, is a neutrophilic activity marker that is useful in monitoring UC disease activity.
Methods: We assessed the effect of OZA on fecal calprotectin (FCP) levels and association with OZA efficacy in TN. During the 10-week (W) induction period, pts were randomized to double-blind (DB) OZA 0.92 mg or placebo (PBO) once daily (Cohort 1) or received open-label (OL) OZA once daily (Cohort 2). Pts with clinical response (CRS) to OZA at W10 were rerandomized to DB OZA or PBO for maintenance through W52. Efficacy endpoints (clinical remission, CRS, endoscopic improvement, mucosal healing, and histologic remission) and FCP levels were assessed at W10 and W52.
Results: Change in FCP from baseline (BL) to W10 was assessed in 517 pts who received DB OZA (n=347) or PBO (n=170) and 293 who received OL OZA. Pts on OZA demonstrated reductions from BL in FCP at W10; this was significant vs PBO ($P<.001$, both cohorts) (Table). FCP reductions were significantly greater in pts with vs without CRS at W10 in all treatment groups ($P<.001$, all groups). Change in FCP from BL to W52 was assessed in 149 pts remaining on OZA and 109 who switched to PBO. FCP levels remained low through W52; pts on continuous OZA had significantly greater FCP reductions at W52 vs pts who switched to PBO ($P=.0002$). FCP reductions were significantly greater in pts with vs without CRS at W52 in OZA-OZA and OZA-PBO groups ($P<.01$, for both). Significantly greater reductions from BL in FCP occurred with OZA vs PBO at W10 and W52 regardless of prior biologic or tumor necrosis factor inhibitor exposure ($P<.05$, all groups). BL FCP level was predictive for CRS and histologic remission at W10 ($P<.05$, both endpoints). Reduction from BL in FCP at W10 was predictive and prognostic for all endpoints except CRS at W52 ($P<.05$, all endpoints).
Conclusion: OZA treatment led to FCP reductions, indicative of decreases in intestinal neutrophil levels. BL FCP was predictive for OZA response. FCP reductions were predictive for OZA response and prognostic for UC. These findings may support use of FCP as a predictive biomarker for OZA response and prognostic biomarker in UC.

Table 1. **Change from baseline in FCP at Weeks 10 and 52**

FCP adjusted mean percent change (95% CI)	Induction (Week 10)			Maintenance (Week 52)	
	Cohort 1		Cohort 2		
	Placebo (n=170)	Ozanimod (n=347)	Ozanimod (n=293)	Ozanimod-placebo (n=109)	Ozanimod-ozanimod (n=149)
All patients	18.8 (-11.6, 59.6)	-59.3 (-67.1, -49.7)	-71.6 (-77.2, -64.5)	-70.7 (-79.6, -57.7)	-87.7 (-91.0, -83.3)
Responders[a]	-48.7 (-68.7, -16.0)	-83.9 (-87.8, -78.8)	-86.2 (-89.5, -81.8)	-81.5 (-87.8, -71.7)	-91.0 (-93.7, -87.1)
Nonresponders[b]	54.9 (12.4, 113.5)	-12.1 (-32.4, 14.4)	-33.3 (-50.9, -9.5)	-10.5 (-53.6, 72.9)	-75.4 (-85.9, -57.2)

[a]Responders during induction are pts who achieved CRS at W10, and responders during maintenance are pts who achieved CRS at W52.
[b]Nonresponders during induction are pts who did not achieve CRS at W10 and nonresponders at W52 did not achieve CRS at W52.

S781

Comparison of Surgical History and Reported Symptoms Between Patients With Concomitant IBD and IBS and Those With IBD Alone

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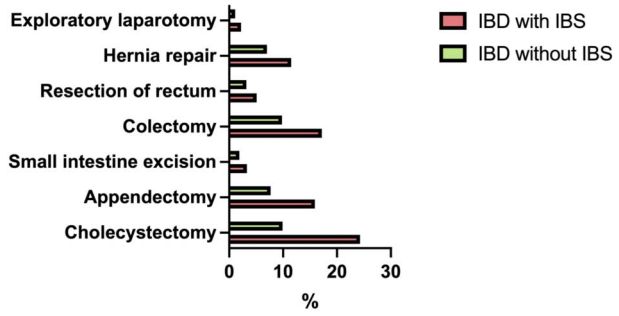
Introduction: While symptoms of inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS) can often overlap, IBD patients with documented remission may continue to experience IBS symptoms of abdominal pain, bloating and altered bowel function. The aim of this study was to determine the history of surgical interventions and gastrointestinal symptoms of patients with concomitant IBD and IBS and compare with patients with IBD alone.
Methods: We performed a population-based study using IBM Explorys database (1999-2022), a large deidentified healthcare database with information from over 300 hospitals across the United States. We identified patients with concomitant diagnosis of IBD and IBS (IBD+IBS). The control group consisted of patients with IBD without IBS. We collected surgical history and common gastrointestinal symptoms in both cohorts. The number of patients and respective percentages were tabulated. Odds ratios (OR) with 95% confidence intervals were used to compare the cohorts.
Results: We identified a total of 366,420 patients with IBD, of which 38,650 (10.5%) patients were reported to have coexisting IBD and IBS, and 327,770 (89.5%) patients had IBD without a concurrent diagnosis of IBS (Table). Patients with both IBD and IBS are more likely to have undergone surgical intervention when compared to patients with IBD alone, including cholecystectomy (24.3 vs 9.9%), appendectomy (15.9% vs 7.7%), small intestine excision (3.3 vs 1.9 %), colectomy (17.2% vs 9.8%), rectal resection (5.1 vs 3.2%), hernia repair (11.5 vs 7.0%) and exploratory laparotomy (2.2 vs 1.1%) (all p value < 0.0001) (Figure). Compared to the patients with IBD alone, patients with coexisting IBD and IBS are more likely to report gastrointestinal symptoms, including abdominal pain (23.1-38.8% vs 8.1-15.2%), diarrhea (66.9% vs 33.2%), constipation 36.2% vs 16.4), bloating (0.9% vs 0.2%), hematochezia (16.2 vs 8.0%) and abnormal weight loss (19.2 vs 8.6%) (all p value < 0.0001).
Conclusion: Surgery and gastrointestinal symptoms appear to be more common in patients with coexisting IBD and IBS when compared to patients with IBD alone. Clearly, much work remains to improve the symptomatic management of functional GI disorders. Targeted therapies may help to reduce the need for surgical intervention and improve the quality of life of patients with overlapping IBD and IBS.



[0781] **Figure 1.** Comparison of Surgical Interventions in IBD+IBS and IBD alone

Table 1. Comparison of Surgical History and Reported Symptoms Between Patients with Concomitant IBD and IBS and Those with IBD alone

		IBD with IBS (N=38650)	%	IBD without IBS (N=327770)	%	OR	95% CI	P
Surgeries	Cholecystectomy	9390	24.3%	32380	9.9%	2.93	2.85-3.00	< 0.0001
	Appendectomy	6140	15.9%	25190	7.7%	2.27	2.20-2.34	< 0.0001
	Small intestine excision	1260	3.3%	6220	1.9%	1.74	1.64-1.85	< 0.0001
	Colectomy	6650	17.2%	32170	9.8%	1.91	1.86-1.97	< 0.0001
	Resection of rectum	1960	5.1%	10610	3.2%	1.60	1.52-1.68	< 0.0001
	Hernia repair	4460	11.5%	22810	7.0%	1.74	1.69-1.80	< 0.0001
	Exploratory laparotomy	860	2.2%	3460	1.1%	2.13	1.98-2.30	< 0.0001
Symptoms	Upper abdominal pain	14990	38.8%	49690	15.2%	3.55	3.47-3.63	< 0.0001
	Lower abdominal pain	12740	33.0%	43210	13.2%	3.24	3.16-3.32	< 0.0001
	Central abdominal pain	11610	30.0%	36460	11.1%	3.43	3.35-3.52	< 0.0001
	Generalized abdominal pain	10690	27.7%	34190	10.4%	3.28	3.20-3.37	< 0.0001
	Right sided abdominal pain	10600	27.4%	35020	10.7%	3.16	3.08-3.24	< 0.0001
	Left sided abdominal pain	8940	23.1%	26410	8.1%	3.43	3.34-3.53	< 0.0001
	Diarrhea	25860	66.9%	108690	33.2%	4.08	3.99-4.17	< 0.0001
	Constipation	13990	36.2%	53840	16.4%	2.89	2.82-2.95	< 0.0001
	Bloating	330	0.9%	500	0.2%	5.64	4.90-6.48	< 0.0001
	Hematochezia	6260	16.2%	26060	8.0%	2.24	2.17-2.31	< 0.0001
	Abnormal weight loss	7420	19.2%	28230	8.6%	2.52	2.45-2.59	< 0.0001

S782

Patients With Inflammatory Bowel Disease (IBD) Who Identify as Transgender Have Increased Mortality and Length of Stay (LOS): An Analysis of In-Hospital Outcomes 2012-2019

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Introduction: Inflammatory Bowel Disease encompasses a group of diseases (Ulcerative Colitis and Crohn's Disease) that causes inflammation in the digestive tract. Patients affected by IBD can experience a gamut of symptoms which range from gastrointestinal bleeding, nausea, vomiting, and abdominal pain to malnutrition and weight loss. Gender differences in IBD have been well studied, however, there are extremely few studies that evaluate the outcomes of patients who have IBD and identify as Transgender compared to patients with IBD who identify as Cisgender. We aimed to study these differences using the National Inpatient Database Sample.
Methods: The National Inpatient Sample (NIS) is a large publicly available all-payer inpatient care database in the USA. In this study, the NIS database was queried for the years 2012-2019. Adult patients (>age 18) with a diagnosis of IBD (Inflammatory Bowel disease, either Ulcerative Colitis or Crohn's Disease) who identified as transgender versus patients with IBD who identified as cisgender, were found using ICD-10 codes. The primary outcome was inpatient mortality. Secondary outcomes were hospital length of stay (LOS) and total hospital charges (TOTHC). Statistical analysis was performed using STATA
Results: We identified 786,431 patients who had a diagnosis of IBD (Ulcerative Colitis and Crohn's Disease). We found 177 patients who were also transgender. After propensity score matching, transgender patients with IBD had an increased mortality rate (2.28%) compared to cisgender patients with IBD (< 1%) which was statistically significant (p< 0.0001). Furthermore, patients with IBD who were identified as transgender had increased LOS (+2.05 days, p< 0.0001, CI: 1.05-3.10) and increased TOTHC ($4,014, p=0.577, CI: -$10,087-$18,114) compared to patients with IBD who did not identify as transgender. TOTHC however was not statistically significant.
Conclusion: Transgender Individuals have a different gender identity than the specific sex they were assigned at birth. It is estimated that fair number of these patients also have IBD. Our study is important because it is the first NIS study to evaluate outcomes in this patient population. We found that there was an increased LOS and mortality in transgender patients with IBD. We hypothesize transgender patients have increased difficulty obtaining care from gastroenterologists and long wait times for treatment. This needs to be further assessed with clinical trials not only for IBD but for various gastrointestinal diseases.

S783

Improvement in Fatigue With Mirikizumab Therapy Is Associated With Improvements in Patient-Reported Outcomes in Patients With Moderately-to-Severely Active Crohn's Disease

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Introduction: Fatigue is a debilitating, underrecognized, multifactorial symptom experienced by many patients (pts) with Crohn's disease (CD). We reported previously that fatigue was significantly improved in pts with CD receiving Mirikizumab (miri) in the AMAG study. Here we assessed the association between changes in selected pt reported outcomes (PROs) and changes in fatigue during the AMAG study.
Methods: 191 pts with moderately to severely active CD were randomized 2:1:1:2 into 4 treatment arms (placebo, 200mg, 600mg, 1000mg miri); miri or placebo (PBO) was administered intravenously every 4 weeks at Week (W) 0, W4, W8. At W12 pts were switched from PBO to miri and re-randomized between miri doses based on response. Fatigue was assessed using the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) questionnaire. Additional PROs included the Inflammatory Bowel Disease Questionnaire (IBDQ), the Short Form (SF-36) health survey physical and mental health components, Pts' Global Rating of Severity (PGRS), and Abdominal Pain Numeric Rating Scale. Pearson's correlation coefficients, 95% confidence intervals, and p-values were calculated. Cohen's conventions were used to assess strength of correlations. Data were pooled for all treatment arms including placebo.

Results: Change in FACIT-F at W12 or W52 showed strong correlations with changes at the same timepoint in IBDQ total score, and IBDQ bowel symptoms, systemic symptoms, emotional function, and social function dimensions, as well as with the SF-36 Mental and Physical Component Scores. Moderate correlations were seen with changes in PGRS and abdominal pain; each of the listed correlations was statistically significant (Table). Similar results were seen for correlations for each of these PROs at W52 (Table).
Conclusion: Improvement in fatigue during treatment for CD was correlated with some aspects of physical symptom improvement, including abdominal pain, but also correlated strongly with emotional, social, and mental well-being. Investigations of bidirectional effects of brain-gut interactions could clarify the relationship between subjective perception of well-being and physical symptom improvement in CD.

Table 1. Correlation of FACIT-F improvement with changes in patient reported outcomes

	Week 12 (N=191)			Week 52 (N=176)		
PRO	**Pearson corr**	**95% CI**	**p-value**	**Pearson corr**	**95% CI**	**p-value**
IBDQ total score	0.714	(0.632, 0.781)	< .0001	0.791	(0.721, 0.845)	< .0001
IBDQ bowel symptoms dimension	0.588	(0.480, 0.678)	< .0001	0.709	(0.617, 0.782)	< .0001
IBDQ systemic symptoms dimension	0.669	(0.577, 0.745)	< .0001	0.777	(0.703, 0.835)	< .0001
IBDQ emotional function dimension	0.672	(0.580, 0.747)	< .0001	0.733	(0.647, 0.800)	< .0001
IBDQ social function dimension	0.608	(0.503, 0.695)	< .0001	0.674	(0.574, 0.754)	< .0001
SF-36 Physical Component Score	0.614	(0.511, 0.700)	< .0001	0.613	(0.500, 0.705)	< .0001
SF-36 Mental Component Score	0.621	(0.519, 0.706)	< .0001	0.687	(0.590, 0.764)	< .0001
Patient's Global Rating of Severity	-0.389	(-0.512, -0.250)	< .0001	-0.469	(-0.591, -0.327)	< .0001
Abdominal pain NRS	-0.365	(-0.491, -0.224)	< .0001	-0.421	(-0.550, -0.272)	< .0001

Abbreviations: CI = confidence interval; corr = correlation; FACIT-F = Functional Assessment of Chronic Illness Therapy-Fatigue; IBDQ = Inflammatory Bowel Disease Questionnaire; N = number of patients in the analysis (including patients with non-missing change scores); NRS = Numeric Rating Scale; PRO = patient reported outcome; SF-36 = 36-Item Short Form Survey.

S784

Sustained Symptom Control With Mirikizumab in Patients With Moderately-to-Severely Active Ulcerative Colitis in the LUCENT-2 Maintenance Trial

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Introduction: Mirikizumab (miri) improved symptom control in a Phase 3, multicenter, randomized, double-blind, parallel, placebo-controlled induction study at Week (W)12, in patients (pts) with moderately-to-severely active ulcerative colitis (UC; LUCENT-1). This analysis assessed sustained symptom control during the maintenance phase through W40 (W52 of continuous therapy), among pts who were induced into clinical response with miri.
Methods: During the 40W maintenance study (LUCENT-2), pts (N=544) who achieved clinical response to miri 300mg Q4W by W12 of induction, were re-randomized 2:1 to subcutaneous (SC) miri 200mg (n=365) or PBO Q4W (n=179). We evaluated sustained control of stool frequency (SF), rectal bleeding (RB), bowel movement urgency (BU) and abdominal pain (AP). The proportion of pts achieving SF Remission (defined as SF=0, or SF=1 with a ≥1-point decrease from induction baseline [BL]), RB Remission (RB=0), Symptomatic Remission (both SF and RB Remission), Stable Maintenance of Symptomatic Remission (defined as pts in Symptomatic Remission for at least 7 out of 9 visits from W4 to W36 and also at Week 40 among pts in Symptomatic Remission and Clinical Response at the end of LUCENT-1), and AP Improvement (Numeric Rating Scale [NRS] pain score ≥30% improvement from BL in pts with baseline AP NRS ≥3) were assessed. BU NRS change from baseline, and the proportion of pts achieving BU Remission (NRS 0 or 1 in pts with BU NRS ≥3 at baseline) were evaluated.
Results: A greater proportion of miri-treated pts achieved SF Remission, RB Remission and Symptomatic Remission compared to PBO at W40 (Table), with significant differences observed from W8 of LUCENT-2 (p=0.042; p=0.004; p=0.036, respectively) and maintained through W40. Miri-treated pts had a significantly higher percentage of Stable Maintenance of Symptomatic Remission (p< 0.001). Pts in the miri-treatment group had a significantly greater mean reduction in BU NRS change from induction BL starting at W12 (p=0.034) onwards compared to PBO (Table). Pts assigned to miri accrued an additional 13.6 percentage-point benefit in BU Remission during the first 8W of maintenance therapy and achieved a significant greater improvement at W40 compared to PBO (p< 0.001, Table). Similarly, AP was significantly improved for the miri-treated group starting at W16 (p=0.034) onwards compared to PBO.
Conclusion: Miri provides sustained control of UC symptoms including BU, RB, and SF compared to PBO in pts with moderately to severely active UC.

Table 1. Proportion of Patients with Sustained Symptom Control at Week 40 (LUCENT-2)

Endpoint (W40)	**PBO SC Q4W N=179**	**Miri 200 mg SC Q4W N=365**	**Risk difference vs PBO (95% CI)***	**P-value**
SF Remission, n (%)	80 (44.7)	274 (75.1)	29.6 (21.2, 38.0)	< 0.001
RB Remission, n (%)	89 (49.7)	291 (79.7)	29.1 (20.8, 37.4)	< 0.001
Symptomatic Remission, n (%)	71 (39.7)	259 (71.0)	30.2 (21.9, 38.6)	< 0.001
Stable Maintenance of Symptomatic Remission, n (%)	N=112** 43 (38.4)	N=264** 184 (69.7)	31.0 (20.7, 41.2)	< 0.001
BU NRS, LSM change from baseline (SE)	-2.74 (0.20)	-3.80 (0.14)	-1.06 (-1.51, -0.61)	< 0.001
BU Remission, n (%)	N=172** 43 (25.0)	N=336** 144 (42.9)	18.1 (9.8, 26.4)	< 0.001
AP NRS ≥30% reduction, n (%)	N=159** 75 (47.2)	N=303** 231 (76.2)	27.4 (18.3, 36.4)	< 0.001

*The Cochran-Mantel-Haenszel (CMH) test, with missing data imputed as nonresponse, was used to assess the outcomes. Mixed Model for Repeated Measures was used to assess BU NRS. *The risk difference and CMH test were both adjusted for the stratification factors of prior biologic or tofacitinib failure, baseline corticosteroid use, region, and clinical remission status at the end of induction study.*
**Baseline population differs according to definition of each endpoint.
Abbreviations: PBO= placebo; miri= mirikizumab; Q4W= every 4 weeks; CI= confidence interval; n= number of patients in the specified category; SF= stool frequency; RB= rectal bleeding; BU= bowel movement urgency; NRS = numeric rating scale; LSM = least square mean; SE= standard error.

S785

The Impact of Bowel Urgency on the Lives of Patients With Ulcerative Colitis in the U.S. and Europe: Communicating Needs and Features of IBD Experiences (CONFIDE) Survey

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Introduction: The Communicating Needs and Features of IBD Experiences (CONFIDE) study aims to increase understanding of the impact of symptoms, including bowel urgency, on the lives of patients (pts) with moderate to severe Ulcerative Colitis (UC) and Crohn's disease in the United States (US), Europe (EUR), and Japan. These data focus on pts in the US and EUR.
Methods: Online, quantitative, cross-sectional surveys of pts with moderate to severe UC were conducted in the US and EUR (France, Germany, Italy, Spain, and UK). Data included pt perspectives on their UC symptoms and the impact on their daily lives. Moderate to severe UC was defined based on treatment, steroid use, and/or hospitalization history. Descriptive statistics summarize the data.
Results: 200 US pts (62% male, mean age 40.4 years) and 556 EUR pts (57% male, mean age 38.9 years) completed the survey, with 77% and 54% currently receiving advanced therapies (biologic or novel oral therapy), respectively. The top 3 symptoms currently (past month) experienced by US and EUR pts were diarrhoea (63% and 50%), bowel urgency (47% and 30%) and increased stool frequency (39% and 30%). In past 3 months, pts who have ever experienced bowel urgency or urge incontinence reported bowel urgency (93% US, 89% EUR) and urge incontinence (86% US, 71% EUR) at least once a month (Table). 69% and 65% of all US and EUR pts, respectively, reported wearing a diaper/pad/protection at least once a month in the past 3 months due to fear/anticipation of urge incontinence. For pts receiving advanced therapies, similar patterns were observed. Among both US and EUR pts, the most common UC-related reasons for declining participation in social events were bowel urgency (43% and 30%) and fear of urge incontinence (40% and 32%). Similarly, the most common reasons for declining participation in work/school and sports/physical exercise were bowel urgency and fear of urge incontinence.
Conclusion: Bowel urgency, which was the second-most frequently reported symptom, has an extensive impact on the lives of pts with moderate to severe UC. In this younger pt population, including pts receiving advanced therapies, almost two thirds of US and EUR pts reported wearing diapers/pads/protection at least once a month in the past 3 months due to fear/anticipation of urge incontinence. Both US and EUR pts reported bowel urgency and fear of urge incontinence as the top reasons for declining participation in social events, work/school, and sports/physical exercise.

Table 1. Frequency of bowel urgency, urge incontinence and diaper/pad/other protection use over the past 3 months*

	Frequency of bowel urgency (all patients who have ever experienced bowel urgency)		Frequency of urge incontinence (all patients who have ever experienced urge incontinence)		Frequency of diaper/pad/other protection use due to fear/anticipation of urge incontinence (all patients)	
	US patients (n=123)	EUR patients (n=250)	US patients (n=90)	EUR patients (n=175)	US patients (n=200)	EUR patients (n=556)
At least once a month, n (%)	114 (93)	222 (89)	77 (86)	124 (71)	137 (69)	361 (65)
Less frequently than monthly, n (%)	7 (6)	19 (8)	5 (6)	25 (14)	15 (8)	60 (11)
Not in the last three months, n (%)	2 (2)	9 (4)	8 (9)	26 (15)	48 (24)	135 (24)

*Percentages are rounded and as a result totals may not add up to 100%

S786

IBD 101: Three-Year Follow-Up of a Primer for First-Year GI Fellows

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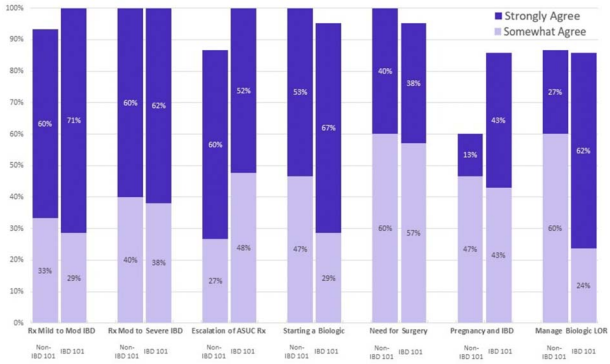
Introduction: The care of inflammatory bowel disease (IBD) has become increasingly complex and specialized. IBD education of gastroenterology (GI) trainees needs improvement and standardization. IBD 101, an annual course designed to introduce first-year GI fellows to various clinical topics in the management of IBD, was held on September 14, 2019. In this inaugural program, a select group of fellows (N=55 from 32 different programs) participated in a one-day course involving small group didactic sessions and Group Observed Structured Clinical Examinations (OSCEs) led by expert faculty members in seven clinical topics.
Methods: To assess the long-term impact of IBD 101, email surveys were administered in May 2022 (the graduating year of the inaugural IBD 101 cohort) to all third-year GI fellows from participating programs, inclusive of both attendees and non-attendees. The primary outcome was comfort level discussing the 7 topics addressed at IBD 101, graded using a Likert scale (1= "strongly disagree" to "4= "strongly agree"). Information regarding each fellow's exposure to IBD education was collected.
Results: Thirty-six fellows completed surveys, of whom 21 (58%) were IBD 101 attendees and 15 (42%) were non-attendees. Overall, attendees reported equivalent or higher levels of comfort in each of the 7 topics than did non-attendees (Figure). In particular, a higher proportion of attendees strongly agreed with comfort in discussing pregnancy and IBD (43% vs. 13%; P=0.04) and loss of response to biologics (62% vs. 27%; P=0.13) than non-attendees. When assessing overall confidence, 76% of attendees reported comfort in all 7 categories, compared with 53% of non-attendees (P=0.15). Attending IBD 101 was associated with overall confidence (OR 5.21 [95% CI 0.91-29.9]; P=0.06) even after adjusting for presence of an IBD specialist at a fellow's home institution, number of IBD patients seen per month (≤5 vs. >5) and rotating through an IBD-only clinic or inpatient service (Table).
Conclusion: IBD 101, a primer for first-year GI trainees, was associated with increased comfort in the management of IBD, with more pronounced impact on challenging topics. IBD 101 is a valuable learning opportunity for first-year GI fellows with a durable benefit independent of individual access to IBD education, and we plan continued development, expansion and assessment of this program in collaboration with the ACG to further enhance the IBD education of the pipeline of GI trainees.



[0786] **Figure 1.** IBD 101 Attendee vs. Non-Attendee Comfort Level in Addressing Various IBD Topics

Table 1. Multivariable Analysis of Factors Associated with Global Confidence in IBD 101 Topics

	Odds Ratio [95% CI]
IBD 101 attendee	5.21 [0.91-29.9]
No. of IBD patients seen per month (>5)	4.48 [0.80-25.2]
IBD specialist at home institution	8.30 [0.47-145.4]
Rotation in IBD-only clinic or inpatient service	2.92 [0.43-19.7)

S787

Early Biologic or Small Molecule Therapy Initiation After Index Hospitalization for an Ulcerative Colitis Flare Prevents Re-Hospitalization

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Introduction: Ulcerative colitis (UC) patients hospitalized for acute flares are at an increased risk for re-hospitalization. A recent RAND panel recommended early (within 3 months) biologic or small molecule therapy initiation post-discharge; however, evidence supporting this strategy is limited. We aimed to quantify the impact of early biologic or small molecule therapy initiation post-discharge on the risk of re-hospitalization in UC patients
Methods: A retrospective cohort study was conducted using TriNetX, a multi-institutional database of more than 70 million patients in the USA. We included UC patients with no prior exposure to biologics or small molecules, hospitalized for the first time, and started on intravenous steroids. We compared re-hospitalization rates for a UC flare at 1- and 2 years based on the timing of medical therapy initiation in-hospital or post-discharge. 1:1 propensity-score matching was performed for age, gender, race, ethnicity, BMI, baseline Hemoglobin (Hgb), C-reactive protein (CRP), and albumin. Odds ratios (OR) with 95% confidence interval (CI) were calculated
Results: A total of 1,203 biologic and small molecule naïve UC patients were hospitalized for an acute flare. Patients were treated with methylprednisolone (74%), with a median CRP of 45.1 and albumin of 3.37 on admission. Re-hospitalization for a flare was observed in 338 (28%) by 3 months and 548 (46%) by 12 months. Inpatient biologic (infliximab) or small molecule (cyclosporine) therapy was used in only 12% of patients, and early post-discharge initiation of a biologic was observed in only 27% of patients. Delayed (between 3-12 months post-discharge) initiation of a biologic or small molecule was associated with a significantly higher risk for re-hospitalization at 1- (OR 1.47, 95% CI 1.01-2.15) and 2 years (OR 1.65, 95% CI 1.14-2.41) post-discharge. No significant differences were observed in re-hospitalization risk among patients starting a biologic or small molecule in-hospital versus within 3 months of discharge (OR 1.15, 95% CI 0.68-1.95). A total of 133 (11%) patients were not started on a biologic or small molecule until > 12 months, and only after they had already been re-hospitalized for a second flare
Conclusion: Biologic and small molecule naïve UC patients hospitalized for an acute flare are at a significantly increased risk for re-hospitalization up to 1-year later. Initiation of biologics or small molecules within 3 months of discharge is associated with a reduction in risk for re-hospitalization.

S788

Long-Term Use of Bile Acid Sequestrants to Improve Diarrhea and Abdominal Pain in IBD Patients With Ileoanal Pouch Anastomosis: A Tertiary Referral Center Experience

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Introduction: Bile acid (BA) sequestrants are commonly used in IBD following ileocecal resection to treat bile acid malabsorption and associated abdominal pain and diarrhea. There is less experience with use of BA binders in IBD patients following colectomy and ileoanal pouch reconstruction. IBD ileoanal pouch patients frequently experience bouts of diarrhea and abdominal pain and have limited treatment options. We sought to characterize our institutional experience with BA sequestrants to treat abdominal pain and diarrhea in a large cohort of IBD ileoanal pouch patients with a focus on longterm therapy and improvement in patient reported outcomes.
Methods: We analyzed a prospective, natural history registry of consented IBD patients followed at a tertiary center (2009-2022). Patients with ileoanal pouch reconstruction following colectomy were identified and individuals with > 2 years of follow up formed the study cohort. BA sequestrants included cholestyramine, colestipol and colesevelam. Patient reported outcomes of diarrhea and abdominal pain, recorded at the time of clinic encounters were organized, and mean scores before and after bile acid binder therapy were compared.
Results: There were 132 ileoanal pouch patients with longterm followup (mean age 51.8 + 13.9 years; 42% F; 58% M). BA sequestrants were initiated in 93 individuals and 63 patients (68%) continued therapy for >2 years, forming the multiyear therapy group. Patterns of BA sequestrant use included 48% receiving one, 41% trialing two and 11% using all three agents. The most commonly prescribed were colesevelam (48 patients), cholestyramine (33 patients) and colestipol (22 patients) and switching between BA sequestrants was commonly due to insurance coverage. The mean number of stools per day improved following initiation of BA sequestrants (p< 0.001). Abdominal pain scores also improved with longterm BA sequestrant therapy (p=0.017). Patterns of healthcare utilization improved with longterm BA sequestrant therapy with a reduction in annual patterns of emergency room visits (p=0.007) and hospitalizations (p< 0.001). (Figure)
Conclusion: A majority of IBD ileoanal pouch patients benefitted from BA sequestrant treatment, reducing number of bowel movements and abdominal pain over a >2 year period, with a parallel reduction in healthcare utilization. Formal trials of BA sequestrants in the longterm management of chronic ileoanal pouch symptoms in the IBD patient population are warranted.

	Before bile acid sequestrants	After bile acid sequestrants	Mean Difference	T	df	p value
Patient reported outcomes						
Mean stool per day	9.02	6.14	0.3	2.4	42	0.017
Mean abdominal pain score (0–3 scale; 0= no pain and 3=severe pain)	1.21	0.9	2.88	3.5	41	<0.001
Health care utilization before and after Bile acid sequestrants						
ED visits (mean per year)	1.2	0.94	0.33	2.7	62	0.007
Hospital admissions (mean per	0.89	0.35	0.55	4.3	62	<0.001

[0788] **Figure 1.** Results before and after bile acid sequestrants.

S789

The Differences of Hospitalization Outcomes Between Teaching and Non-Teaching Hospitals in Taking Care of Patients With Inflammatory Bowel Disease in the United Sates

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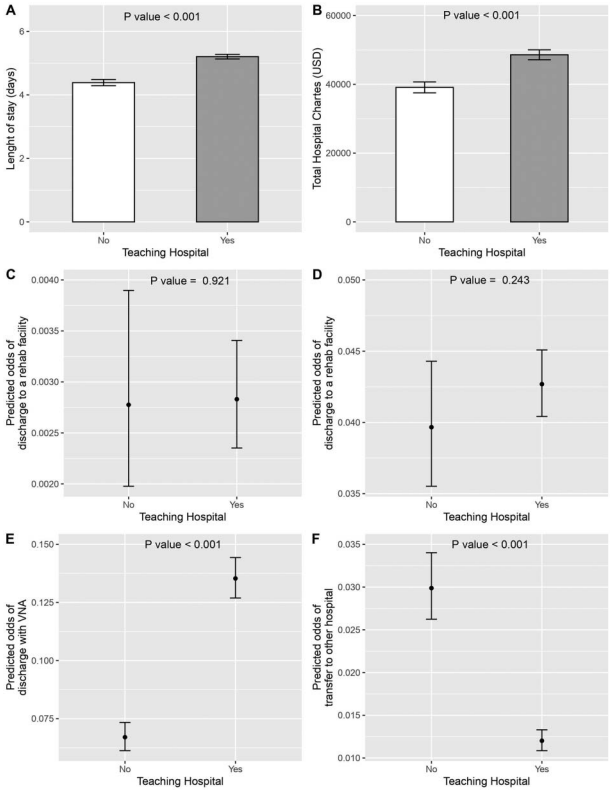
Introduction: IBD costs continue to rise in the US.[1] Teaching hospitals tend to have more resources for care, but the effect of these resources on cost and utilization is unknown.[2] We therefore investigated the differences in characteristics and outcomes of patients admitted to teaching hospitals vs non-teaching hospitals.
Methods: We utilized the national inpatient sample data (NIS) 2016-2018[3] and hospitalized patients with a 1ry discharge diagnosis of IBD were identified. We excluded all patients who were younger than 18 years and classified our population to those who were admitted to teaching and non-teaching hospitals. Our outcomes included hospital length of stay (LOS), hospital charges, mortality, and discharge disposition. Survey analysis was applied to account for discharge weight and multistage sampling of the NIS data.[4] We calculated the propensity score for patients based on their demographics, hospital bed size and region, Charlson comorbidity index,[5] obesity, and tobacco, alcohol, or drug use. We estimated the average treatment effect weight based on the propensity score and used it to adjust differences between the two groups.
Results: 281,440 patients (weighted number) were eligible for our study and 203,815 patients were admitted to teaching hospitals. These patients were more likely to be from larger counties, had private insurance, higher median household income, and their hospitals were more likely to be located at the Northeast or the Midwest (Table). In the adjusted analyses, patients who were admitted to teaching facilities

had a higher mean difference of LOS (0.82 days, 95% CI 0.7 – 0.94, P < 0.001), hospital charges ($9,482.75, 95%CI 7,336.2 – 11,629.3, P=0.14), higher odds ratio (OR) of discharge with visiting nurse (2.02, 95% CI 1.81 – 2.26, P=< 0.001), and lower OR to be transferred to other hospitals (0.4, 95%CI 0.34 – 0.48, P< 0.001). (Figure)

Conclusion: In this national analysis of hospitalized patients with IBD, patients who were admitted to teaching hospitals were associated with higher utilization of healthcare resources even after adjusting for demographic, hospitals differences, and comorbidities. Further studies are needed to understand the differences in care at teaching and non-teaching hospitals to explain the cause for the increased utilization of resources in teaching hospitals compared to non-teaching hospitals.



[0789] **Figure 1.** The hospitalization outcomes for patients with Inflammatory Bowel Disease based on their hospital type, teaching vs non-teaching facilities.

Table 1. Baseline characteristics for hospitalized patients with IBD comparing patients who were admitted to teaching vs non-teaching hospitals

Characteristics	Teaching Hospitals	Non- teaching Hospitals	P value
Total number (Weighted)	203,815	77,625	
Age (mean (SD))	44.56 (17.81)	47.74 (18.33)	< 0.001
Female (%)	108,075 (53)	42,730 (55.1)	< 0.001
Race (%)			< 0.001
•F020White	139,595 (71.0)	59,149.9 (78.7)	
•F020Black	30,525 (15.5)	7,785 (10.4)	
•F020Hispanic	17,065 (8.7)	5,185 (6.9)	
•F020Others	9,505 (4.8)	3,075 (4.1)	
Patient Location: NCHS Urban-Rural Code (%)			< 0.001
•F020"Central" counties of ≥1 million population	68,235 (33.6)	12,725 (16.4)	
•F020"Fringe" counties of ≥1 million population	57,420 (28.3)	20,360 (26.3)	
•F020Counties of 250,000-999,999 population	42,580 (21.0)	13,740 (17.7)	
•F020Counties of 50,000-249,999 population	16,120 (7.9)	8,890 (11.5)	
•F020Not metropolitan or micropolitan counties	18,685 (9.2)	21,739.9 (28.1)	
Expected primary payer (%)			< 0.001
•F020Medicare	48,645 (23.9)	23,385 (30.2)	
•F020Medicaid	39,290 (19.3)	14,000 (18.1)	
•F020Private insurance	98,510 (48.4)	32,045 (41.4)	
•F020Self-pay/ Others/No charge	17,100 (8.4)	8,025 (10.4)	
Median household income for patients ZIP Code (%)			< 0.001
•F0200-25th percentile	48,885 (24.3)	22,435 (29.4)	
•F02026th to 50th percentile	47,765 (23.8)	22,730 (29.8)	
•F02051st to 75th percentile	53,400 (26.6)	17,320 (22.7)	

Table 1. (*continued*)

Characteristics	Teaching Hospitals	Non- teaching Hospitals	P value
•F02076th to 100th percentile	50,780 (25.3)	13,845 (18.1)	
Weighted Charlson Comorbidity (mean (SD))	0.64 (1.30)	0.68 (1.30)	0.003
Alcohol use disorder (%)	3,655 (1.8)	1,670 (2.2)	0.007
Drug use disorder (%)	12,795 (6.3)	4,600 (5.9)	0.16
Tobacco use (history and current) (%)	34,295 (16.8)	15,345 (19.8)	< 0.001
Patients with Obesity (%)	18,370 (9)	6545 (8.4)	< 0.001
Weekend admissions (%)	40,890 (20.1)	17,940 (23.1)	< 0.001
Bed size of the hospital (%)			< 0.001
•F020Small	40,970 (20.1)	12,300 (15.8)	
•F020Medium	55,340 (27.2)	23,860 (30.7)	
•F020Large	107,505 (52.7)	41,465 (53.4)	
Region of the hospital (%)			< 0.001
•F020Northeast	49,705 (24.4)	10,870 (14.0)	
•F020Midwest	51,420 (25.2)	17,025 (21.9)	
•F020South	71,525 (35.1)	35,110 (45.2)	
•F020West	31,165 (15.3)	14,620 (18.8)	

S790

The Safety of Ustekinumab Treatment in Patients With Moderate-to-Severe Crohn's Disease and Latent Tuberculosis/HBV Infection: A Nationwide Retrospective Study

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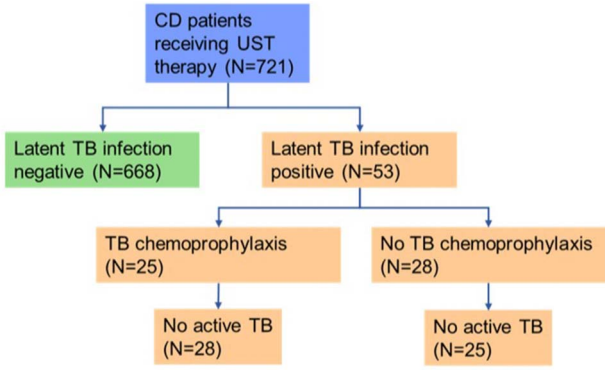
Introduction: Ustekinumab is a human monoclonal antibody specially blocking interleukin-12/23 has been approved in China for moderate-to-severe Crohn's disease in 2020. There is concern about the risk of infectious among biological agents treated patients, because of the high prevalence of tuberculosis and hepatitis B viral (HBV) infection in China and the expected risk of reactivation is higher in these patients. We aimed to assess the risk of tuberculosis and hepatitis B virus reactivation in Crohn's disease patients with latent tuberculosis infection (LTBI) and previous HBV infection who are receiving Ustekinumab.
Methods: A multi-center retrospective cohort study was performed at 68 hospitals in China of 721 adult patients with CD receiving ustekinumab from May 1, 2020 to October 31, 2021, Crohn's disease with concomitant LTBI or HBV carrier were included. All patients were tested for hepatitis B serology, T-SPOT TB and tuberculin skin tests at baseline. LTBI was defined as positive of T-SPOT TB or tuberculin skin tests, HBV carrier was defined as hepatitis B surface antigen and isolated anti-HBc positivity. The primary outcome of this study was tuberculosis or hepatitis B reactivation.
Results: Patients with Crohn's disease concomitant LTBI or HBV carrier receiving ustekinumab therapy were retrospectively enrolled from 17 hospitals in China. Fifty-three Crohn's disease with LTBI patients and seventeen Crohn's disease patients with HBV carrier patients receiving ustekinumab were included. Figure summarized the inclusion of the latent TB patients treated with ustekinumab. The average follow-up was 32 ± 20 weeks and 28 ± 16 weeks, respectively. Twenty-five Crohn's disease patients with LTBI received chemoprophylaxis regimen and eleven HBV carrier patients received antiviral prophylaxis. No cases of LTBI reactivation, virologic reactivation, and liver dysfunction were observed during the follow-up period. (Figure)
Conclusion: The risk of reactivation of HBV/TB infection during immunosuppressant treatment is dependent on many factors and it influences the choice of practice significantly. This study has a medium time follow-up period and it is the largest studies involving patients with CD coexistent with TB or HBV receiving ustekinumab therapy in a high TB/HBV burden region. The outcomes indicate that ustekinumab could be safe for Crohn's disease since whether received prophylaxis regimen or not, none developed tuberculosis, liver enzymes increasing, persistent hepatitis or acute liver failure during therapy.



[0790] **Figure 1.** Analysis of the incidence of active TB in the latent TB infection with UST therapy

S791

Impact of Biologic Therapies on Risk of Major Adverse Cardiovascular Events in Crohn's Disease: Systematic Review and Meta-Analysis of Randomized Controlled Trials

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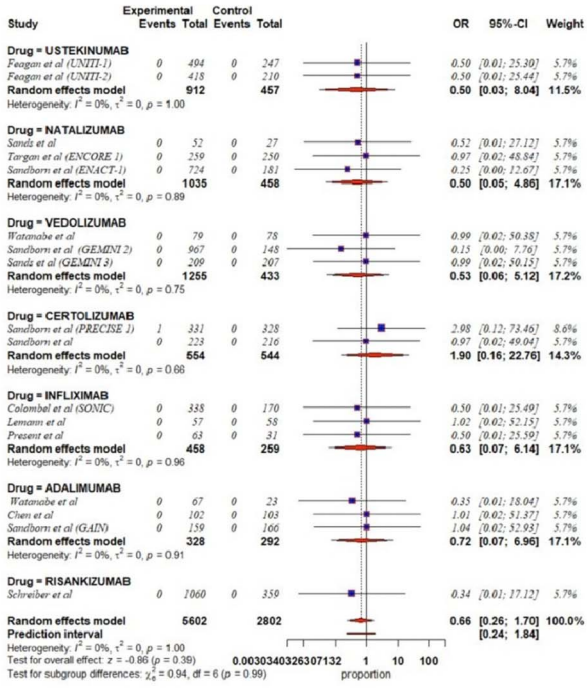
Introduction: Biologic therapies are efficacious in inducing response and remission in patients with moderate to severe Crohn's Disease (CD); however, no previous systematic reviews investigated risk of major adverse cardiovascular events (MACEs). The aim of this systematic review and meta-analysis is to estimate the risk of MACEs in adult patients with CD treated with biologic therapies.
Methods: We systematically searched Medline, Cochrane Central Register of Controlled Trials, Scopus, and Embase databases up to March 2022 to identify eligible studies that assessed the risk of MACEs in adult patients (age ≥18 years) with CD on biologic therapies. Only phase 3, active-comparator or placebo controlled randomized trials (RCTs) were included in the analysis. Our primary outcome was the rate of

MACEs observed in patients receiving biologic therapies during induction and maintenance phases of RCTs. Random effects model was used to calculate pooled odds ratios (ORs) and 95% CIs and I2 statistics was used to assess heterogeneity.

Results: Twenty-nine RCTs involving 12196 patients with CD were included in our systematic review and meta-analysis. There was no evidence of statistical heterogeneity across the studies using the I2 statistic (I2=0). Biologic therapies were not associated with increased risk of MACEs during induction [infliximab (OR 0.63, 95% CI 0.07–6.14), adalimumab (OR 0.72, 95% CI 0.07–6.96), ustekinumab (OR 0.50, 95% CI 0.03–8.04), natalizumab (OR 0.50, 95% CI 0.05–4.86), vedolizumab (OR 0.53, 95% CI 0.06–5.12), certolizumab (OR 1.90, 95% CI 0.16–22.76) and risankizumab (OR 0.34, 95% CI 0.01–17.12)]. Additionally, there was no statistically significant difference in risk of MACEs associated with the use of biologic therapies during maintenance compared to placebo [infliximab (OR 0.72, 95% CI 0.01–5.10), adalimumab (OR 0.80, 95% CI 0.08–7.77), ustekinumab (OR 1.53, 95% CI 0.06–37.71), natalizumab (OR 1.02, 95% CI 0.02–51.59), vedolizumab (OR 0.70 95% CI 0.04–11.53), and certolizumab (OR 1.91, 95% CI 0.16–22.83].

Conclusion: Although pervious systematic reviews have studied the efficacy of biologic therapies in CD, major adverse cardiovascular events (MACEs), which are important safety outcomes, have not been addressed. In our study, we found that the use of biologic therapies among adult patients with Crohn's disease was not associated with increased risk of MACEs. However, patient level data were lacking and meta-regression analyses were not performed to adjust for confounding factors. (Figure)

A.



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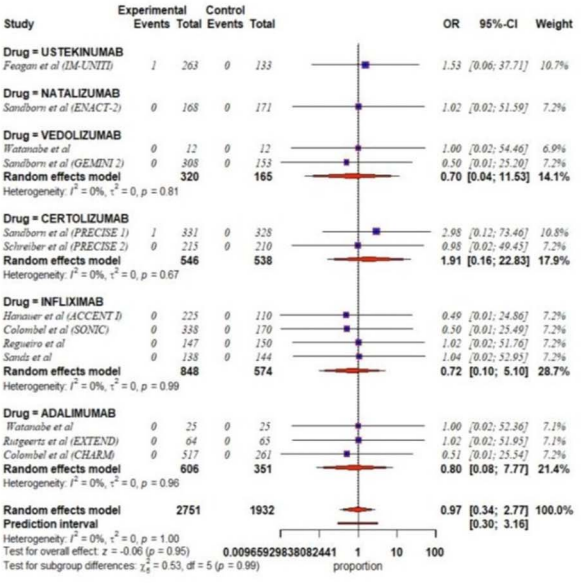

[0791] **Figure 1.** A. Forest plot showing risk of MACEs in patients receiving biologic therapies for the induction of remission in randomized controlled trials B. Forest plot showing risk of MACEs in patients receiving biologic therapies for the maintenance of remission in randomized controlled trials

S792

Patient Activation and Clinical Trial Participation in a Racially/Ethnically Diverse Population With Inflammatory Bowel Disease: Results From the National Health and Wellness Survey

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Introduction: Black, Indigenous, and People of Color (BIPOC) are often underrepresented in clinical trials, limiting the generalizability of study results. However, research has shown BIPOC enrollment rates are similar to White participants when offered the opportunity to partake in culturally sensitive settings that address social needs. Patient activation measure (PAM) scores, which assess a patient's engagement in their health care, may also influence clinical trial participation. In this study, the relationship between race/ethnicity, PAM scores, and clinical trial participation was evaluated in participants with inflammatory bowel disease (IBD).
Methods: Data were obtained from the 2018–2020 United States National Health and Wellness Survey. Adults with self-reported, known diagnosed Crohn's disease (CD) or ulcerative colitis (UC) and a valid PAM score were included. Bivariate analyses were conducted to compare sociodemographic characteristics, PAM scores, and clinical trial participation across racial/ethnic groups.
Results: Analyses included 1,077 participants with CD (818 White, 109 Black, and 150 Hispanic) and 1,500 with UC (1,150 White, 99 Black, and 251 Hispanic). Significant differences were observed in sociodemographic characteristics and disease severity across racial/ethnic groups for CD and UC. Mean PAM scores were significantly lower in Black (56.90 [SD 12.95]) and Hispanic (58.16 [13.76]) participants with CD than in White participants (62.31 [12.30], P< 0.001 and P=0.001, respectively). PAM scores were also lower in Black (58.41 [14.25]) and Hispanic (58.03 [13.55]) participants with UC than in White participants (62.28 [11.44], P=0.007 and P< 0.001, respectively). Despite these differences, 33.9% and 39.4% of Black and 45.3% and 38.6% of Hispanic participants with CD and UC, respectively, had previously enrolled in clinical trials, compared with 20.0% of White participants with CD and 16.6% with UC (all P≤0.003). (Table)
Conclusion: Contrary to conventional belief, these findings using data from a nationally representative source indicate that a higher proportion of BIPOC participants had previously enrolled in clinical trials than White participants, despite lower PAM scores. Notably, sampling bias of the survey population and across participants, as well as respondent misinterpretation of the survey, may influence these results. Further research is needed to better understand the factors influencing BIPOC participation in clinical trials.

Table 1. Sociodemographic characteristics and study outcomes in White, Black, and Hispanic participants with IBD

	CD (N = 1,077)			UC (N = 1,500)		
	White (n = 818)	Black (n = 109)	Hispanic (n = 150)	White (n = 1,150)	Black (n = 199)	Hispanic (n = 251)
Sociodemographics						
Female, n (%)	421 (51.5%)	55 (50.5%)	55 (36.7%)	696 (60.5%)	47 (47.5%)	138 (55.0%)
Age in years, mean (SD)	48.34 (16.48)	36.84 (14.39)*	34.05 (11.05)†	52.48 (16.28)	38.48 (16.08)	38.45 (14.27)†
Education, n (%)						
Less than a college graduate	383 (46.8%)	66 (60.6%)*	81 (54.0%)	564 (49.0%)	59 (59.6%)	133 (53.0%)
College graduate or higher	434 (53.1%)	43 (39.4%)*	69 (46.0%)	582 (50.6%)	39 (39.4%)	118 (47.0%)
Decline to answer	1 (0.1%)	0 (0.0%)	0 (0.0%)	4 (0.3%)	1 (1.0%)	0 (0.0%)
Employment status, n (%)						
Employed full time	364 (44.5%)	56 (51.4%)	94 (62.7%)†	424 (36.9%)	44 (44.4%)	132 (52.6%)†
Self-employed	54 (6.6%)	9 (8.3%)	13 (8.7%)	78 (6.8%)	9 (9.1%)	15 (6.0%)
Employed part-time	83 (10.1%)	14 (12.8%)	12 (8.0%)	85 (7.4%)	17 (17.2%)*	30 (12.0%)
Homemaker	39 (4.8%)	7 (6.4%)	3 (2.0%)	73 (6.3%)	3 (3.0%)	19 (7.6%)
Retired	159 (19.4%)	2 (1.8%)*	9 (6.0%)†	321 (27.9%)	9 (9.1%)	29 (11.6%)
Student	21 (2.6%)	9 (8.3%)*	7 (4.7%)	16 (1.4%)	8 (8.1%)	8 (3.2%)
Long-Term Disability	56 (6.8%)	5 (4.6%)	5 (3.3%)	84 (7.3%)	2 (2.0%)	12 (4.8%)
Not employed (whether looking for work or not)	42 (5.1%)	7 (6.4%)	7 (4.7%)	69 (6.0%)	7 (7.1%)	6 (2.4%)
Household income, n (%)						
< $25,000	102 (12.5%)	32 (29.4%)*	16 (10.7%)	166 (14.4%)	22 (22.2%)*	39 (15.5%)
$25,000 to < $50,000	163 (19.9%)	20 (18.3%)	29 (19.3%)	235 (20.4%)	25 (25.3%)	53 (21.1%)
$50,000 to < $100,000	289 (35.3%)	29 (26.6%)	47 (31.3%)	409 (35.6%)	29 (29.3%)	74 (29.5%)
$100,000+	246 (30.1%)	27 (24.8%)	57 (38.0%)	299 (26.0%)	23 (23.2%)	77 (30.7%)
Decline to answer	18 (2.2%)	1 (0.9%)	1 (0.7%)	41 (3.6%)	0 (0.0%)	8 (3.2%)
Health insurance, n (%)						
Not insured	58 (7.1%)	16 (14.7%)*	21 (14.0%)†	88 (7.7%)	11 (11.1%)	37 (14.7%)†
Commercially insured	456 (55.7%)	65 (59.6%)	91 (60.7%)	583 (50.7%)	54 (54.5%)	149 (59.4%)†
Medicaid	81 (9.9%)	10 (9.2%)	11 (7.3%)	85 (7.4%)	13 (13.1%)	21 (8.4%)
Medicare	203 (24.8%)	15 (13.8%)*	14 (9.3%)†	362 (31.5%)	16 (16.2%)*	27 (10.8%)†
Other type of insurance/unsure	20 (2.4%)	3 (2.8%)	13 (8.7%)†	32 (2.8%)	5 (5.1%)	17 (6.8%)†
Severity of condition, n (%)						
Mild	514 (62.8%)	51 (46.8%)*	83 (55.3%)	789 (68.6%)	61 (61.6%)	134 (53.4%)†
Moderate	249 (30.4%)	43 (39.4%)	50 (33.3%)	300 (26.1%)	27 (27.3%)	93 (37.1%)†
Severe	55 (6.7%)	15 (13.8%)*	17 (11.3%)	61 (5.3%)	11 (11.1%)	24 (9.6%)†
PAM score and clinical trial participation						
PAM score[a], mean (SD)	62.31 (12.30)	56.90 (13.95)*	58.16 (13.76)†	62.28 (11.44)	58.41 (14.25)*	58.03 (13.55)†
Ever participated in a clinical trial, n (%)	164 (20.0%)	37 (33.9%)*	68 (45.3%)†	191 (16.6%)	39 (39.4%)*	97 (38.6%)†

[a]PAM scores range from 0 to 100 where higher scores indicate higher levels of activation.
*P < 0.05 between Black and White participants.
†P < 0.05 between Hispanic and White participants.
‡P < 0.05 between Hispanic and Black participants.
Note: P values were calculated using Bonferroni-adjusted pairwise comparisons.
Abbreviations: BMI = body mass index; CCI = Charlson comorbidity index; GAD = general anxiety disorder; HRCU = healthcare resource utilization; HRQoL = health-related quality of life; PAM = patient activation measure; PHQ = patient health questionnaire; SD = standard deviation; USD = United States dollar; WPAI = work productivity and activity impairment.

S793

Full Target Engagement With Saturation of α4β7 Integrin Receptor Occupancy Resulting in Changes in Subset of Lymphocytes by MORF-057 Following 200 Mg Daily Dosing in Healthy Subjects

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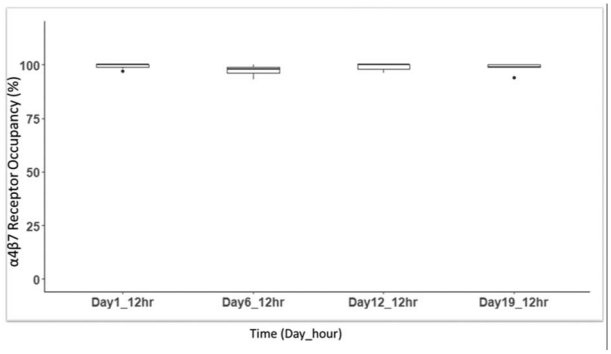
Morphic Therapeutic, Waltham, MA.

Introduction: MORF-057 is a potent and selective $\alpha_4\beta_7$ integrin inhibitor being developed as an oral treatment for patients with inflammatory bowel disease. In a previously reported Phase 1 study in healthy subjects (NCT04580745) MORF-057 was well tolerated and demonstrated favorable pharmacokinetic (PK) and pharmacodynamic (PD) properties at doses up to 100 mg twice daily (BID). This study evaluated second generation formulation and the multidose assessment to 200 mg BID.
Methods: An immediate release formulation in capsules at dosage strengths of 25 and 100 mg was used for this study. This was a two-part healthy volunteer study where Part 1 investigated the safety and PK of a single administration of 25 mg (fasted) and 100 mg (fasted, fed) MORF-057. Part 2 investigated the safety, PK and PD of a single dose of 200 mg MORF-057 followed, after washout, by 14 days of repeat dosing at 200 mg BID. Blood samples to assess PK (Part 1 and 2) and receptor occupancy (RO; Part 2 only) of $\alpha_4\beta_7$ and $\alpha_4\beta_1$ integrins were obtained prior to the first dose and 12 hours post-dose. Changes in lymphocyte subsets (LS) and expression of C-C Motif Chemokine Receptor 9 (CCR9) mRNA in blood were also measured in Part 2 of the study. (Figure)
Results: A total of 20 subjects were enrolled in the study (n=8 in Part 1; n=12 in Part 2). Three non-serious adverse events (AEs) were reported. No AEs were deemed related to MORF-057, and no safety signals were identified. Approximately dose proportional exposures of MORF-057 was observed following single administration at doses from 25 to 200 mg. MORF-057 was rapidly absorbed with a T_{max} ranging from 2-4 hours. The high fat meal delayed the absorption resulting in a slight decrease in AUC (23%) and C_{max} (49%) and an increase in C_{trough} (46%). Saturating $\alpha_4\beta_7$ RO (99%) was achieved at 12 hours following a single 200 mg dose and was sustained over multiple doses at 200 mg BID. α4β1 RO was below the limit of quantitation. The B cells and T cell subsets, and expression of CCR9 mRNA in blood, were elevated at Day 19 during BID dosing. (Table)
Conclusion: Single and multiple dose MORF-057 was well tolerated in this study. Compared with data from a previous study, biomarker responses are consistent between 100 and 200 mg BID suggesting saturation of biomarker effect. MORF-057 demonstrated a favorable PK and PD profile supporting further clinical development.



[0793] **Figure 1.** α4β7 receptor occupancy (RO) Following Multiple Oral Administration of 200 mg BID MORF-057 Data presented as boxplots with central line representing the median value; α4β7 RO was measured at trough (12 h post dose) after a single administration (Day1_12h) and during repeat dose administration at 200 mg BID (Day6_12h, Day12_12h, Day19_12h).

Table 1. Summary of Plasma MORF-057 PK Parameters Following Single Dose Administration AUC, Cmax, and C12, values are presented as geometric mean (geometric CV%). Tmax is presented as median (min, max)

Pharmacokinetic Parameter (Unit)	Part 1 Period 1 100 mg MORF-057 IR Capsules (Fasted) (N=8)	Part 1 Period 2 100 mg MORF-057 IR Capsules (Fed) (N=7)	Part 1 Period 3 25 mg MORF-057 IR Capsules (Fasted) (N=7)	Part 2 200 mg MORF-057 IR Capsules (Fasted) (N=9)
$AUC_{0\text{-inf}}$ (h*ng/mL)	2050 (51.2)	1660 (41.1)	604 (36.5)	3770 (30.3)
C_{max} (ng/mL)	545 (45.9)	299 (48.7)	139 (38.6)	970 (46.6)
C_{12} (ng/mL)	19.0 (81.9)	35.1 (98.6)	5.98 (61.8)	40.0 (44.1)
T_{max} (h)	2.01 (1.02, 4.02)	4.00 (1.50, 4.00)	1.50 (1.00, 2.50)	2.50 (1.52, 4.02)

NA = Not Applicable.

S794

Pathway Enrichment Analysis Reveals Ulcerative Colitis Patients With Non-Response to TNFi Therapy May Have More Biological Dysregulation

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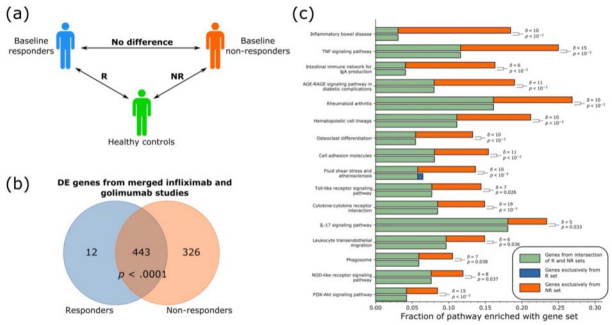
Introduction: Tumor necrosis factor-α inhibitors (TNFi) are essential to ulcerative colitis (UC) management, however only 50% of patients will achieve a clinical response during induction therapy. There is an unmet need to identify and predict UC therapy response. This study aims to analyze potential etiologies for lack of TNFi response using pathway enrichment analysis.
Methods: Differential expression analysis between TNFi responders, non-responders, and healthy controls was conducted from Gene Expression Omnibus UC patient cohorts (Table) using the limma package. All datasets contained post-treatment mucosal gene expression data and corresponding response, defined as endoscopic healing at 4 to 8 weeks after treatment initiation. Enrichment analysis of signaling pathways from the Kyoto Encyclopedia of Genes and Genomes (KEGG) database was performed to compare the gene expression profile dysregulation severity between responders and non-responders. Genes exclusive to each group for select significantly enriched pathways were identified. The difference between the number of responder and non-responder exclusive genes was computed and assessed using the random label permutation test. Significantly different pathways between non-responder-exclusive genes and responder-exclusive genes were reported.
Results: Several differentially expressed genes between responders and healthy controls (R-set) and between non-responders and healthy controls (NR-set) were identified (Figure a). Multiple overlapping dysregulated genes were observed between the two groups. Non-responders had significantly more differentially expressed genes (Figure b). Pathway enrichment analysis on the R- and NR-sets demonstrated that 40 of 282 KEGG pathways were significantly enriched with non-responder genes ($p< 0.05$). Of the 40 pathways, 28 had significantly more NR-exclusive genes than R-exclusive genes ($p< 0.05$) (Figure c). The NR-set included unique differentially expressed genes involved in cytokine signaling, receptor mediation, and signal transduction.
Conclusion: UC-relevant KEGG pathways are significantly more enriched and disrupted in non-responders compared to responders, suggesting that non-responders have more dysregulated biological pathways. Other enriched pathways highlight the role of inflammation, barrier integrity, and the intestinal microbiome in UC. This study illustrates the potential value of precision medicine to predict clinical response to TNFi in UC patients.



[0794] **Figure 1.** KEGG pathway enrichment analysis for genes differentially expressed in responders and non-responders at baseline with respect to healthy controls. (a) schematic illustration of the differential expression gene sets obtained by comparing different pairs of responders, non-responders, and healthy controls; (b) Venn diagram showing responders' and non-responders' differentially expressed genes at baseline with respect to healthy controls after merging infliximab- and golimumab-based cohorts. Merging is done by taking the intersection of differential expression gene sets from infliximab- and golimumab-based cohorts; (c) KEGG pathways significantly enriched with NR-gene set that also have significantly more NR-exclusive genes than R-exclusive genes. UC-related pathways are shown here.

Table 1. Number of patients from Gene Expression Omnibus UC patient cohort datasets included in analyses

Cohort	Dataset	Control	Responders	Non-Responders
Infliximab	GSE16879	6	8	16
	GSE23597	-	24	7
Golimumab	GSE92415	21	32	27

S795

Predictive Value of Primary Non-Response in Initial Biologic for IBD on Future Biologics

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Introduction: The armamentarium of medical therapies to treat inflammatory bowel disease (IBD) continues to grow, giving patients more options if they fail their first biologic. Currently, there are limited studies investigating the predictive value of first biologic primary nonresponse (PNR) on subsequent biologic success. Our objective was to determine if PNR to the first biologic for IBD is predictive to response to subsequent biologic therapy.
Methods: A multicenter retrospective study was performed on IBD patients that received two or more biologics. PNR was defined as no clinical or symptomatic improvement leading to cessation of drug. Patients who stopped their first biologic due to adverse side effects were classified in the intolerance group. Patients with initial significant response to biologic followed by a loss of response including antibody response to the biologic agent were classified as secondary loss of response (SLOR). Python was used for analysis.
Results: We identified 87 patients with PNR, 96 patients with SLOR, and 66 patients with intolerance to their first biologic exposure. In patients with PNR, there was a significantly (p=0.0344) higher percentage of patients with ulcerative colitis and indeterminate colitis (UC: 57.5%, IC: 10.3%) compared to Crohn's disease (CD: 32.2%). Among patients who had PNR, SLOR, or intolerance of their first biologic, there was no significant difference in those that demonstrate non-response to their second biologic. Univariate and multivariate analyses showed no difference in rates of PNR to second biologic when switching intra-class or out of class. There was a trend towards significance of higher rates of PNR to adalimumab as second biologic when switching from infliximab (OR 0.36, CI: 0.09 – 1.55, p = 0.171), however the total sample size was low (n=60). Additionally, when analyzing Crohn's disease and ulcerative colitis separately, there were no differences in response to second biologic after PNR to first biologic. (Table)
Conclusion: Our results are reassuring that despite PNR to first biologic, there is a high chance of response to second biologic. Subanalyses evaluating intraclass and out of class medication switches showed similar success, however larger studies are required to better evaluate this. Ulcerative colitis and indeterminant colitis have higher rates of PNR compared to Crohn's disease, but still have high response to second biologic agents.

Table 1.

	n	Odds Ratio (Confidence Interval) PNR / (SLOR + Intolerance)	p value
Response to 2nd biologic			
All biologics changes	258	1.06 (0.58 - 1.91)	0.859
Anti-TNF to anti-TNF	110	0.70 (0.29 - 1.66)	0.419
IFX to ADA	60	0.36 (0.09 - 1.55)	0.171
ADA to IFX	48	0.89 (0.24 - 3.31)	0.868
Anti-TNF to non-TNF (class switch)	113	1.26 (0.47 - 3.38)	0.645
Subanalyses by Disease			
Crohn's Disease			
All biologics changes	116	0.98 (0.40 - 2.45)	0.974
Anti-TNF to anti-TNF	69	0.52 (0.17 - 1.58)	0.248
IFX to ADA	35	0.48 (0.06 - 3.89)	0.489
ADA to IFX	32	0.57 (0.12 - 2.60)	0.469
Anti-TNF to non-TNF	-	n too small to calculate	-
Ulcerative Colitis			
All biologic changes	142	0.86 (0.37 - 2.01)	0.735
Anti-TNF to anti-TNF	41	1.01 (0.24 - 4.26)	0.986
IFX to ADA	25	0.28 (0.04 - 2.17)	0.226

Table 1. (*continued*)

	n	Odds Ratio (Confidence Interval) PNR / (SLOR + Intolerance)	p value
ADA to IFX	16	1.80 (0.09 - 35.42)	0.699
Anti-TNF to non-TNF	80	0.81 (0.26 - 2.51)	0.718

S796

Monitoring in Post-Operative Crohn's Disease: Describing Approaches and the Impact of Guidelines

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Introduction: Ileocecal resection (ICR) often leads to remission of Crohn's Disease (CD), but relapse is common. Guidelines suggest postoperative biologic prophylaxis in high-risk patients and colonoscopy within 6-12 months of surgery to assess for post-operative recurrence (POR). Guidance on adjunctive disease monitoring modalities such as biomarkers and cross-sectional imaging is lacking. We aimed to describe the real-world surveillance approach for CD patients after ICR in relation to evidence-based guidelines.
Methods: This was a dual center retrospective study of CD patients who underwent ICR with ≥1 year of follow-up. We grouped patients into high- (HR) and low-risk (LR) for POR per guidelines and assessed the use of biomarkers, imaging, and colonoscopy postoperatively. Approaches and recurrence rates in patients who received resection prior to or after 2015, accounting for changing practices with guidelines, were compared. Biomarker, radiographic, and endoscopic POR were defined as high CRP/fecal calprotectin (FC), active inflammation on CT/MRE, and modified Rutgeerts ≥i2b, respectively. P-values were calculated using Wilcoxon and Chi squared tests.
Results: Of 1026 CD patients who underwent ICR, 798 were HR. For LR patients, median time to first CRP was 244 days (d), FC was 267d, imaging was 579d, and colonoscopy was 392d. For HR patients, median time to first CRP was 183d, FC was 241d, imaging was 460d, and colonoscopy was 352d. 72% of HR patients had at least 1 modality within 1 year compared to 59% of LR. Compared to pre-2015, patients who underwent an ICR in 2015 or later had significantly earlier imaging (543d vs. 379d, $p < 0.001$) and colonoscopy (404d vs. 292d, $p < 0.001$). There was no difference in time to first CRP or FC. Timing of ICR was significantly associated with postoperative biologic use and the detection of POR by all methods ($p < 0.001$).
Conclusion: 30% of HR CD patients did not undergo any monitoring within the first year after ICR. Evolving practice patterns suggest earlier disease monitoring with imaging and colonoscopy in more recent years whereas utilization of biomarkers was not changed. These data suggest that while guidelines have changed practice, allowing for the earlier identification of POR and initiation of therapy, many patients remain under-monitored. As earlier monitoring may improve long-term clinical outcomes, additional studies are required to further guide optimal surveillance intervals and use of biomarkers.

S797

Direct and Indirect Effects of Tofacitinib on Work Productivity in Patients With Ulcerative Colitis: A Mediation Analysis Between Work Productivity and the Mayo Score

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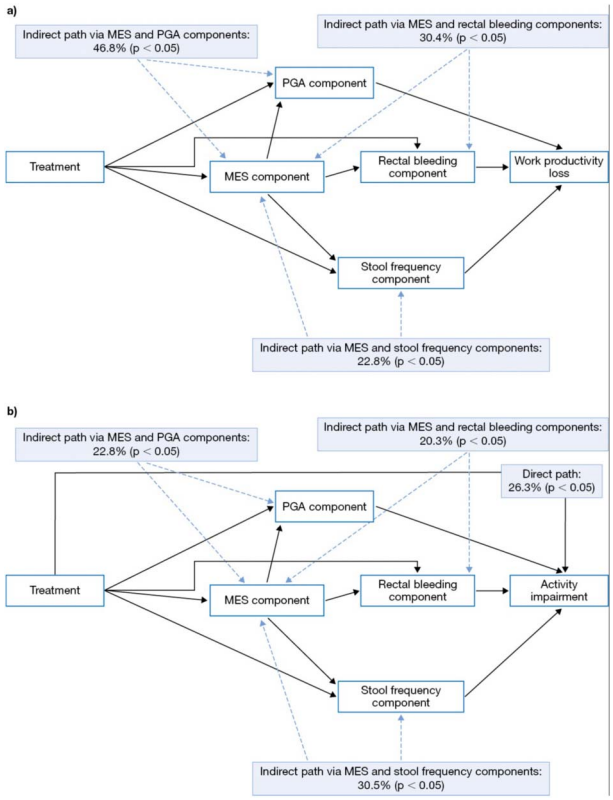
Introduction: Tofacitinib is an oral small molecule JAK inhibitor for the treatment of UC. Tofacitinib induction treatment has been shown to improve work productivity in patients (pts) with UC. However, it is unknown whether improvements in work productivity are fully explained by changes in the Mayo score or if other factors not captured by these changes contribute.
Methods: We evaluated the interrelationship between Mayo score components (rectal bleeding [RB], stool frequency [SF], Mayo endoscopic subscore [MES], and Physician Global Assessment [PGA]) and Work Productivity and Activity Impairment-UC (WPAI-UC) components (overall work productivity loss and activity impairment) among pts in the Phase 3, 8-week induction studies that evaluated tofacitinib as induction therapy for UC (OCTAVE Induction 1&2; NCT01465763; NCT01458951). A mediation model used Mayo score components as mediators of the treatment effect on WPAI-UC components as outcomes. The MES was modelled as a predecessor of RB, SF, and PGA components as these are at least partially impacted by endoscopic inflammation. Work productivity loss and activity impairment can be viewed as complementary outcomes covering work and other daily activities, respectively. Analyses used all available pooled data from Week 8 in pts receiving tofacitinib/placebo.
Results: There were 484 and 1,073 pts available for analysis in the models assessing work productivity loss and activity impairment, respectively. For the model evaluating work productivity loss, 100% of the impact of tofacitinib was mediated through Mayo score components, with the largest effect mediated by MES and PGA (46.8%; Figure a). For the model evaluating the effect of tofacitinib on activity impairment, 26.3% of the effect was mediated through factors not captured by the Mayo score, and 73.7% was mediated through Mayo score components; the largest effect was via MES and bowel-related symptoms, specifically SF (30.5%; Figure b).
Conclusion: This analysis suggests the effects of tofacitinib on work productivity loss in pts with UC were fully mediated by Mayo score components, whereas the effects on activity impairment were only partially mediated by these. Bowel-related symptoms had the largest indirect effects in non-work environments. These findings provide important insights into the interrelationship between Mayo score components and WPAI-UC and may help inform healthcare providers on the impact of UC therapies on pts' work and leisure activities.



[0797] **Figure 1.** Summary of direct and indirect (mediated through Mayo score components) effects of tofacitinib vs placebo on the a) work productivity loss and b) activity impairment WPAI-UC components as a percentage of the total treatment effect. The WPAI-UC is a self-administered six-item questionnaire that generates four metrics: absenteeism (work time missed), presenteeism (impairment whilst working), productivity loss (overall work impairment from the combination of absenteeism and presenteeism), and activity impairment (non-work activity impairment). WPAI-UC component scores are expressed as percentages, with a higher percentage indicating greater impairment and less productivity. The Mayo score measures disease activity by assessing stool frequency, rectal bleeding, endoscopic appearance, and PGA. Total Mayo score ranges from 0 to 12 points (each subscore ranges from 0 to 3), with higher scores indicating more severe disease activity. MES, Mayo endoscopic subscore; PGA, Physician Global Assessment; WPAI-UC, Work Productivity and Activity Impairment-Ulcerative Colitis.

S798

Indirect Effects of Tofacitinib on Work Productivity in Patients with Ulcerative Colitis: A Mediation Analysis Between Work Productivity and the Inflammatory Bowel Disease Questionnaire

Laura Targownik, MD, MSHS[1], Marla C. Dubinsky, MD[2], Flavio Steinwurz, MD, MSc, MACG[3], Andrew G. Bushmakin, MS[4], Joseph C. Cappelleri, PhD, MPH[4], Elaine Tai, PharmD[5], Sean Gardiner, MD[6], Peter Hur[6], Julian Panés, MD, PhD[7].

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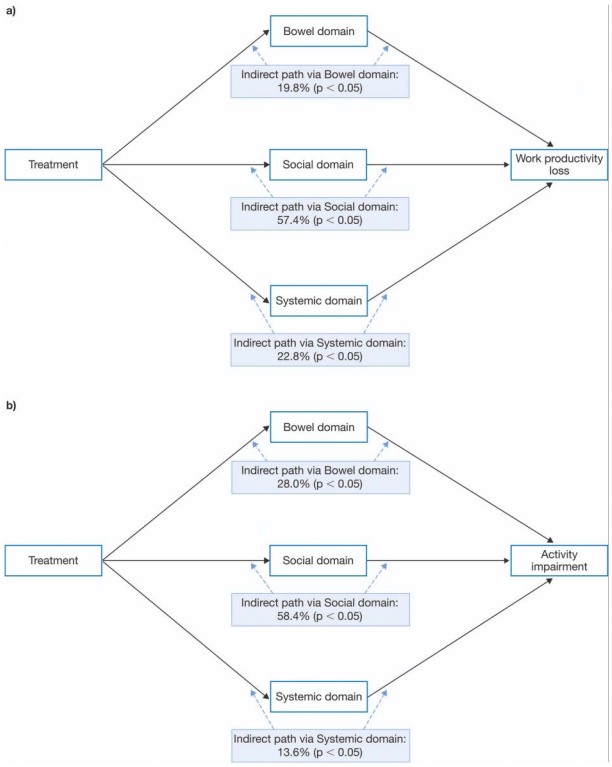
Introduction: Tofacitinib is an oral small molecule JAK inhibitor for the treatment of UC. Tofacitinib induction treatment has been shown to improve work productivity in patients (pts) with UC. However, it is unknown whether improvements in work productivity are fully explained by changes in the Inflammatory Bowel Disease Questionnaire (IBDQ) or if other factors not captured by these changes contribute.
Methods: We evaluated the interrelationship between IBDQ domains (bowel, emotional, social, and systemic) and Work Productivity and Activity Impairment-UC (WPAI-UC) components (overall work productivity loss and activity impairment) among pts in the Phase 3, 8-week induction studies that evaluated tofacitinib as induction therapy for UC (OCTAVE Induction 1&2; NCT01465763; NCT01458951). A mediation model used IBDQ domains as mediators of the treatment effect on WPAI-UC components as outcomes. Work productivity loss and activity impairment can be viewed as complementary outcomes covering work and other daily activities, respectively. Analyses used all available pooled data from Week 8 in pts receiving tofacitinib/placebo.
Results: There were 490 and 1,083 pts available for analysis in the models assessing work productivity loss and activity impairment, respectively. For the models evaluating work productivity loss (Figure a) and activity impairment (Figure b), the effects of tofacitinib were fully mediated via IBDQ domains; the largest effects were via the IBDQ social domain, which represented 57.4% and 58.4% of the effects of tofacitinib on work productivity loss and activity impairment, respectively (Figure a and Figure b, respectively). The impact of tofacitinib via the IBDQ emotional domain did not affect work productivity loss or activity impairment.
Conclusion: This analysis suggests that the effects of tofacitinib induction therapy on work productivity loss and activity impairment in pts with UC were fully mediated via IBDQ bowel, social, and systemic domains. These findings provide insights into the interrelationship between IBDQ domains and WPAI-UC and may help inform healthcare providers on the impact of UC therapies on pts' work and leisure activities.



[0798] **Figure 1.** Summary of indirect (mediated through IBDQ domains) effects of tofacitinib vs placebo on the a) work productivity loss and b) activity impairment WPAI-UC components as a percentage of the total treatment effect. The WPAI-UC is a self-administered six-item questionnaire that generates four metrics: absenteeism (work time missed), presenteeism (impairment whilst working), productivity loss (overall work impairment from the combination of absenteeism and presenteeism), and activity impairment (non-work activity impairment). WPAI-UC component scores are expressed as percentages, with a higher percentage indicating greater impairment and less productivity. The IBDQ evaluates disease-related quality of life by 32 items over four domains: bowel (total domain score ranges from 10 to 70), emotional (total domain score ranges from 12 to 84), social (total domain score ranges from 5 to 35), and systemic (total domain score ranges from 5 to 35). For the total score (ranges from 32 to 224) and each domain, a higher score indicates a better quality of life. IBDQ, Inflammatory Bowel Disease Questionnaire; WPAI-UC, Work Productivity and Activity Impairment-Ulcerative Colitis

S799

Health-Related Quality of Life with Guselkumab Induction and Maintenance Therapy as Measured by PROMIS-29: Results Through Week 48 of Phase 2 GALAXI 1 Study

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Introduction: Patients (pts) with Crohn's disease (CD) suffer from symptoms that negatively impact their health related quality of life (HRQoL). In GALAXI 1, a phase 2 study of guselkumab (GUS), a selective IL-23 antagonist, for the treatment of pts with moderately to severely active CD who had inadequate response or intolerance to conventional therapies and/or biologics, HRQoL was evaluated using the Patient-Reported Outcomes Measurement Information System (PROMIS)-29.

Methods: GALAXI has a treat-through design with pts remaining on randomized treatment (GUS or ustekinumab [UST]) through Wk48. Pts were randomized 1:1:1:1:1 into 5 arms for induction: GUS 200, 600, or 1200mg IV at Weeks (Wks) 0, 4, 8; UST ~6mg/kg IV at Wk0 and 90mg SC at Wk8; or PBO IV. At Wk12, pts transitioned to maintenance: GUS 200mg IVà100mg SC q8w, GUS 600mg IVà200mg SC q4w, GUS 1200mg IVà200mg SC q4w, PBO non-respondersàUST ~6mg/kg IVà90mg SC q8w, and PBO respondersàPBO SC q4w. UST pts continued 90mg SC q8w. Pts randomized to PBO were not included in the Wk48 analyses. PROMIS-29 consists of 7 domains (depression, anxiety, physical function, pain interference, fatigue, sleep disturbance, and social participation) and a pain intensity 0-10 numeric rating scale (NRS). The raw score of each domain is converted into a standardized T-score with a general population mean of 50 and standard deviation (SD) of 10. For physical function and social participation, higher scores indicate better outcomes, while for all other symptom domains like anxiety, higher scores indicate worse outcomes. Clinically meaningful improvement was defined as ≥3-point improvement in pain NRS score and ≥5-point (or 1/2 SD of population) improvement in each domain T-score.

Results: Among pts randomized and evaluated in the primary efficacy analysis, mean PROMIS-29 domain scores were similar between treatment groups at baseline with functional domain score < 50 and symptom domain scores >50, indicating impaired HRQoL (Table). Pts treated with GUS had greater improvement in all domain scores at Wk12 compared with PBO. GUS treatment resulted in continued improvement in domain scores from Wk12 to Wk48. GUS-treated pts achieved clinically meaningful improvement in fatigue T-scores (45.9-63.5%), pain interference T-scores (52.5-71.4%) and pain intensity NRS score at Wk48 (56.4-70.2%).

Conclusion: Induction and maintenance treatment with GUS was effective in improving HRQoL as measured by PROMIS-29 in pts with moderately to severely active CD at Wk48.

Table 1. Change from baseline at Wk 12 and Wk 48 for PROMIS-29 scores

	Placebo (N=61)	GUS 200 mg IV q4w à100 mg SC q8w (N=61)	GUS 600 mg IV q4w à200 mg SC q4w (N=63)	GUS 1200 mg IV q4w à 200 mg SC q4w (N=61)	UST ~6 mg/kg IV à90 mg SC q8w (N=63)
Anxiety T-score [a,b]					
Baseline, mean (SD)	57.68 (10.004), N=57	56.43 (9.344), N=60	56.94 (9.843), N=63	57.29 (9.455), N=61	54.25 (9.068), N=63
Change from baseline, mean (SD), at:					

Table 1. (*continued*)

	Placebo (N=61)	GUS 200 mg IV q4w à100 mg SC q8w (N=61)	GUS 600 mg IV q4w à200 mg SC q4w (N=63)	GUS 1200 mg IV q4w à 200 mg SC q4w (N=61)	UST ~6 mg/kg IV à90 mg SC q8w (N=63)
Wk 12		-4.63 (8.869),* N=58	-3.43 (9.178),* N=61	-6.78 (7.805),** N=57	-3.86 (7.908), N=63
Wk 48	-0.73 (8.872), N=56	-5.66 (10.437), N=56	-4.85 (8.831), N=58	-6.34 (10.188), N=49	-5.09 (6.624), N=59
Depression T-score [a,b]	54.99 (9.386), N=57				
Baseline, mean (SD)	-0.17 (8.384), N=56	54.33 (9.306), N=60	53.64 (10.567), N=63	54.07 (9.499), N=61	52.20 (8.619), N=63
Change from baseline, mean (SD), at:					
Wk 12		-4.54 (10.567),** N=58	-1.98 (7.123),* N=61	-5.48 (6.999),** N=57	-3.70 (8.217), N=63
Wk 48		-4.91 (11.899), N=56	-3.33 (8.077), N=58	-5.52 (9.559), N=49	-2.86 (7.055), N=59
Fatigue T-score [a,b]	57.80 (9.128), N=57				
Baseline, mean (SD)	-0.89 (9.640), N=56	56.36 (9.193), N=60	56.74 (10.097), N=63	58.35 (9.361), N=61	56.03 (8.991), N=63
Change from baseline, mean (SD), at:					
Wk 12		-7.33 (9.320),** N=58	-6.30 (9.314)**, N=61	-7.27 (8.021),** N=57	-5.91 (10.467), N=63
Wk 48		-7.59 (10.587), N=56	-9.53 (9.903), N=58	-8.03 (9.114), N=49	-7.44 (9.369), N=59
Pain interference T-score [a,b]	62.25 (6.625), N=57				
Baseline, mean (SD)	-2.43 (7.811), N=56	60.26 (8.550), N=60	62.26 (6.337), N=63	60.69 (7.418), N=61	60.37 (8.431), N=63
Change from baseline, mean (SD), at:					
Wk 12		-8.19 (9.467),** N=58	-9.29 (8.997),** N=61	-6.60 (7.659),** N=57	-7.93 (9.854), N=63
Wk 48		-10.71 (10.989), N=56	-13.44 (9.060), N=58	-10.34 (9.568), N=49	-7.70 (9.334), N=59
Pain intensity NRS score, [a,b]	5.53 (2.122), N=57				
Baseline, mean (SD)	-0.84 (2.380), N=56	5.13 (2.012), N=60	5.49 (1.925), N=63	5.46 (2.038), N=61	5.37 (2.238), N=63
Change from baseline, mean (SD), at:					
Wk 12		-2.41 (2.740),** N=58	-2.82 (2.164),** N=61	-2.30 (2.420),** N=57	-2.21 (2.259), N=63
Wk 48		-3.11 (2.695), N=56	-3.53 (2.494), N=58	-2.88 (2.990), N=49	-2.73 (2.420), N=59
Physical Function T-score [a,b]	42.70 (7.491), N=57				
Baseline, mean (SD)	1.24 (8.106), N=56	44.71 (8.391), N=60	45.24 (7.888), N=63	43.16 (8.275), N=61	45.72 (8.056), N=63
Change from baseline, mean (SD), at:					
Wk 12		4.64 (8.249),* N=58	3.73 (7.053),* N=61	3.40 (8.037),* N=57	3.30 (7.888), N=63
Wk 48		5.98 (8.851), N=56	5.73 (8.242), N=58	5.18 (8.243), N=49	3.80 (7.307), N=59
Sleep disturbance T-score [a ,b]	55.06 (8.418), N=57				
Baseline, mean (SD)	-0.88 (6.833), N=56	54.19 (8.062), N=60	54.84 (7.181), N=63	53.23 (7.447), N=61	52.55 (7.408), N=63
Change from baseline, mean (SD), at:					
Wk 12		-4.83 (8.489),** N=58	-4.05 (5.805),* N=61	-4.02 (5.727),** N=57	-3.16 (8.143), N=63
Wk 48		-5.36 (8.520), N=56	-6.28 (7.636), N=58	-5.48 (7.018), N=49	-4.61 (7.580), N=59
Ability to participate in social roles and activities T-score [a,b]	45.50 (7.990), N=57				
Baseline, mean (SD)	0.58 (7.962), N=56	46.25 (9.278), N=60	46.80 (8.705), N=63	45.40 (9.329), N=61	47.99 (8.827), N=63
Change from baseline, mean (SD), at:					
Wk 12		6.54 (8.867),** N=58	5.18 (8.922),** N=61	5.49 (7.130),** N=57	4.81 (8.364), N=63
Wk 48		7.65 (10.842), N=56	8.56 (9.877), N=58	7.10 (8.142), N=49	5.44 (8.757), N=59

*Nominal p-value < 0.05 for guselkumab vs placebo at Wk 12.
**Nominal p-value < 0.001 for guselkumab vs placebo at Wk 12.
[a]Patients who had a prohibited change in concomitant Crohn's disease medication, a Crohn's disease-related surgery, or discontinued study agent due to lack of efficacy or an AE of worsening Crohn's disease prior to the designated analysis timepoint had their baseline value carried forward from that timepoint onwards. Patients who had discontinued study agent due to any other reasons prior to the designated analysis timepoint had their observed data used, if available, from that timepoint onwards.
[b]Patients who had insufficient data to calculate PROMIS-29 domain score at the designated analysis timepoint did not have their missing data imputed.
NOTE: No comparisons between ustekinumab and placebo were made at Wk 12. No treatment comparisons were made at Wk 48. The p-values for the comparisons of each guselkumab treatment group with the placebo group at Wk 12 were based on MMRM analysis including change from baseline in PROMIS-29 domain score as the response; treatment group, visit, baseline PROMIS-29 domain score, BIO-Failure status (yes, no), baseline CDAI stratification (≤300, >300), an interaction term of visit with treatment group and an interaction term of visit with baseline PROMIS-29 domain score as explanatory variables.

S800

Dose Escalation of Biologic Therapies in Biologic Treatment-Naïve Patients With Crohn's Disease: Results From the ODESSA-CD Study

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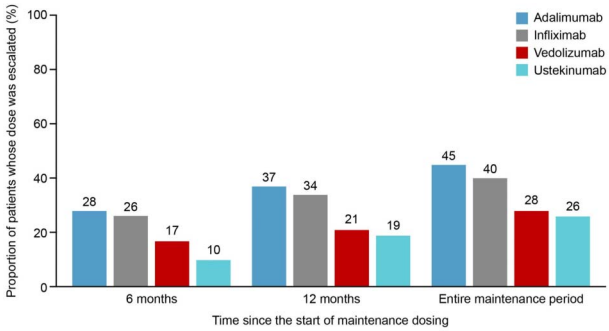
Introduction: Dose escalation is often used to recapture response in patients with Crohn's disease (CD) who experience loss of response to biologic treatment; however, real-world data on rates of dose escalation are mostly limited to anti-tumor necrosis factor (TNF) therapies. Furthermore, outcomes after dose escalation have not been well characterized.
Methods: ODESSA-CD (real wOrld Dose EScalation and outcomeS with biologics in IBD pAtients) is a retrospective cohort study investigating dose escalation and outcomes in biologic-naïve patients with CD who received adalimumab, infliximab, ustekinumab, or vedolizumab, using data from the IBM® MarketScan® Research Databases. Adult patients with at least one claim for a study drug between January 1, 2017 and December 31, 2018 were included, with the first claim date defined as index date 1. Eligible patients had at least two claims for CD at least 10 days apart, identified using CD diagnosis codes, with at least one claim on or before index date 1. The maintenance period began on index date 2, defined as the date of the third (adalimumab) or fourth (infliximab or vedolizumab) claim or the first subcutaneous dose after an intravenous dose (ustekinumab) after index date 1. Dose escalation was defined as an increase of at least 20% in average daily dose relative to expected daily dose based on prescribing information for CD during the maintenance period. Drug costs after dose escalation were calculated from the paid amount captured in medical or pharmacy claims.
Results: During the entire maintenance period, the proportions of patients with CD (N = 2,664) whose dose was escalated were 45% for adalimumab, 40% for infliximab, 28% for vedolizumab, and 26% for ustekinumab (Figure). Mean unweighted drug costs after dose escalation ranged from $12,717.97 for vedolizumab to $36,045.07 for adalimumab (Table). Among patients whose dose was escalated, mean per patient per month drug costs were lowest for vedolizumab ($4,503.78) and highest for ustekinumab ($13,800.81).
Conclusion: This real-world study of US claims data confirms frequent dose escalation of all biologics in biologic-naïve patients with CD. Vedolizumab and ustekinumab had less frequent dose escalation than anti-TNF therapies, and drug costs were lowest for vedolizumab. While there are multiple factors that lead to dose escalation, the findings from this study may help to inform clinicians' choice of treatment and positioning of biologic therapies in CD.



[0800] **Figure 1.** Proportion of patients with Crohn's disease whose dose was escalated

Table 1. Drug costs after dose escalation in patients with Crohn's disease

Study drug	Overall cohort, N	Mean (SD) unweighted study drug cost per patient, US$
Adalimumab	1,178	36,045.07 (68,787.33)
Infliximab	1,046	22,469.39 (58,648.70)
Vedolizumab	311	12,717.97 (30,936.18)
Ustekinumab	129	33,339.80 (99,630.47)

Study drug	Patients whose dose was escalated, N	Mean (SD) study drug cost per patient per month, US$
Adalimumab	436	6,467.41 (2,936.65)
Infliximab	353	4,617.56 (4,119.17)
Vedolizumab	66	4,503.78 (1,817.49)
Ustekinumab	24	13,800.81 (6,587.90)

SD, standard deviation.

S801

Long-Term Persistence to Ustekinumab and Adalimumab Among Bio-Naïve Patients With Crohn's Disease

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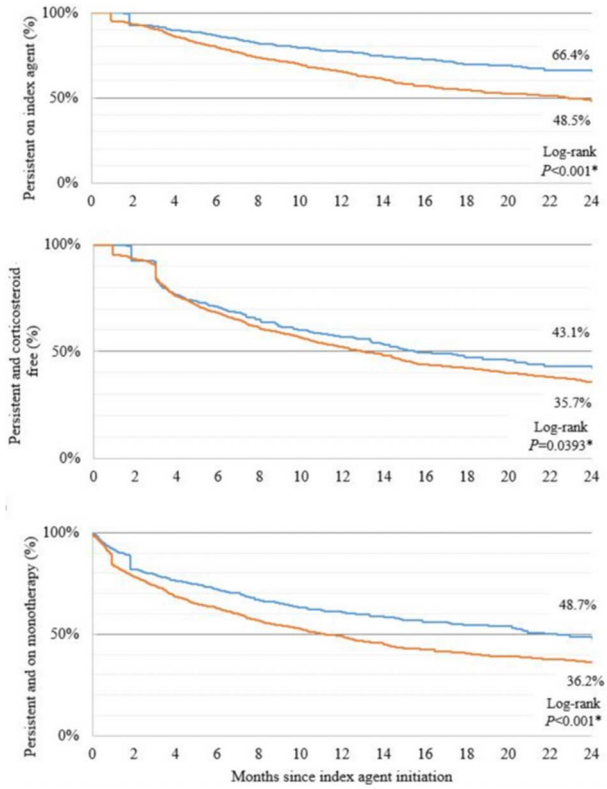
[1]Analysis Group, Inc., Montreal, PQ, Canada; [2]Janssen Scientific Affairs, LLC, Horsham, PA.

Introduction: Persistence on biologics in Crohn's disease (CD) is an important measure, reflecting real-world treatment effectiveness, safety, and other factors. In the real world among bio-naïve patients with CD, evidence of superior one-year persistence on newer biologics, such as ustekinumab, relative to adalimumab exists, however, an understanding of persistence beyond one year is lacking.
Methods: Adults with CD initiated on ustekinumab or adalimumab between 09/23/2016 (approval of ustekinumab for CD in the US) and 08/01/2019 were selected from IBM® MarketScan® Commercial Database. Patients without other CD-indicated biologics (bio-naive) and diagnoses for other autoimmune diseases in the 12 months pre-index date (baseline) were included. No minimal follow-up was imposed post-index date. Persistence on index agent was defined as absence of gaps >120 days (ustekinumab) or >60 days (adalimumab) between days of therapy supply. Composite endpoints of being persistent and corticosteroid-free (no corticosteroids with ≥14 days of supply after day 90 post-index) and persistent while on monotherapy (no immunomodulators or non-index biologics) were also assessed. Cohorts were balanced on baseline characteristics using inverse probability of treatment weights. All endpoints were estimated at 24 months post-index using weighted Kaplan-Meier and Cox's proportional hazards models.
Results: There were 671 and 2,975 patients in the ustekinumab and adalimumab cohorts, respectively, and the cohorts were well-balanced at baseline (Table). At 24 months post-index, a significantly higher proportion of patients in the ustekinumab versus adalimumab cohort was persistent on index agent, as well as persistent and corticosteroid-free and persistent while on-monotherapy (Figure). At 24 months in ustekinumab versus adalimumab cohort, the rate of being persistent on index agent was 66% higher (hazard ratio [HR]: 1.66; 95% confidence interval [CI]: 1.40-1.97), the rate of being persistent and corticosteroid-free 15% higher (HR: 1.15; 95% CI: 1.01-1.31), and the rate of being persistent while on-monotherapy 44% higher (HR: 1.44; 95% CI: 1.26-1.64).
Conclusion: Bio-naïve patients with CD initiated on ustekinumab versus adalimumab were significantly more persistent, more persistent and corticosteroid-free, and also more persistent while on-monotherapy 24 months after treatment initiation. These results are consistent with those in our previous work at 12 months.



[0801] **Figure 1.** Kaplan-Meier curves of being: a) persistent on index biologic, b) persistent and corticosteroid-free following a 90 days grace period, c) persistent and on monotherapy in weighted ustekinumab and adalimumab cohorts1,2 Notes: 1. Cohorts were weighted on baseline characteristics using inverse probability of treatment weights 2. Rates and log-rank p-values provided at 24 months.

Table 1. Selected baseline characteristics in weighted1 ustekinumab and adalimumab cohorts

Mean ± SD or n (%)	Ustekinumab N=671		Adalimumab N=2,975		Std diff, %
Age	41.7	± 13.3	41.6	± 13.8	0.8
Female	371	(55.3%)	1,642	(55.2%)	0.2
All-cause costs (US$ 2020)	35,258	± 57,472	30,104	± 52,884	9.3
Prescription drug costs	5,095	± 11,691	5,029	± 18,564	0.4
Total medical costs	30,163	± 55,485	25,075	± 47,187	9.9
Charlson Comorbidity Index	0.60	± 1.2	0.61	± 1.1	0.8
CD-related surgery	57	(8.5%)	221	(7.4%)	4.0
Medication					
Corticosteroids	440	(65.6%)	2,068	(69.5%)	8.4
≥1 episode with ≥60 days of continuous use	164	(24.4%)	736	(24.8%)	0.7
Immunomodulators	177	(26.4%)	797	(26.8%)	1.0
5-ASA	177	(26.4%)	795	(26.7%)	0.8
Antidiarrheals	51	(7.6%)	204	(6.9%)	2.8

Abbreviations: CD: Crohn's disease; Std diff: standardized difference; SD: standard deviation; 5-ASA: 5-aminosalicylic acid Notes: (1) Cohorts were weighted on baseline characteristics using inverse probability of treatment weights; characteristics considered well balanced if standardized difference is <10%

S802

Persistence Among Patients With Crohn's Disease Previously Treated With an Anti-tumor Necrosis Factor Inhibitor and Switching or Cycling to Another Biologic Agent

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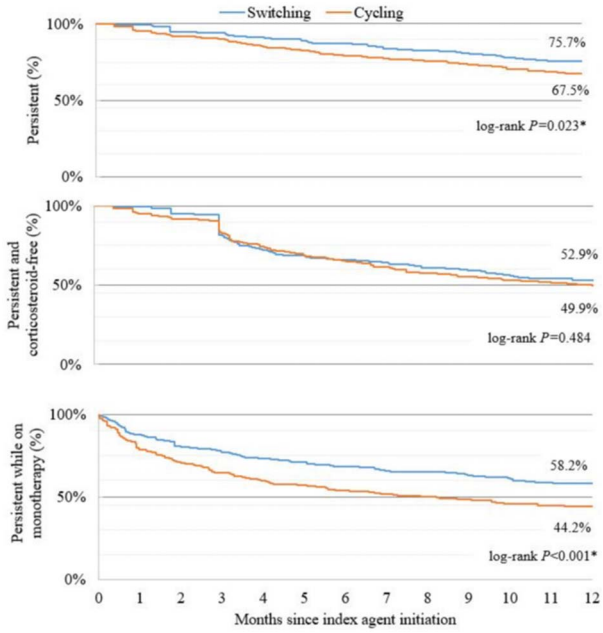
[1]Analysis Group, Inc., Montreal, PQ, Canada; [2]Janssen Scientific Affairs, LLC, Horsham, PA.

Introduction: Among patients with Crohn's disease (CD), non-response to an anti-TNF agent can lead to switching to a biologic in a different class (i.e., ustekinumab, vedolizumab) or cycling to another anti-TNF agent (i.e., adalimumab, infliximab, certolizumab). This study compared real-world persistence among patients with CD who switch or cycle from an anti-TNF agent.
Methods: Adults with CD treated with an anti-TNF whose first switching or cycling (index date) occurred between 09/23/2016 and 08/01/2019 were selected from the IBM® MarketScan® Commercial Database. Patients had: ≥12 months of continuous insurance eligibility before the first anti-TNF, discontinuation of the first anti-TNF within 12 months (baseline period) of the index date, and no other immune disorders in the 12-month baseline period. Cohorts were balanced on baseline characteristics using inverse probability of treatment weights (IPTW). Persistence to index biologic (i.e., biologic switched or cycled to) was defined as absence of therapy exposure gaps >120 days (ustekinumab, vedolizumab, infliximab) or >60 days (adalimumab, certolizumab) between days of supply. Composite endpoints were: persistence and

being corticosteroid-free (no corticosteroids with ≥14 days of supply after day 90 post-index), and persistence while on monotherapy (no immunomodulators/non-index biologics). Weighted Kaplan-Meier and Cox models were used to assess outcomes at 12 months post-index.

Results: After IPTW, the sample size was 444 and 441 in the switching and cycling cohorts, and baseline characteristics were well balanced (Table). At 12 months post-index, the proportions of patients persistent to the index agent and patients persistent while on-monotherapy were significantly higher in the switching compared to the cycling cohort (Figure). In the switching compared to the cycling cohort, the rate of being persistent to the index agent was 44% higher (hazard ratio [HR]: 1.44; 95% confidence interval [CI]: 1.11-1.88; P=0.007*), the rate of being persistent and corticosteroid-free 8% higher (HR: 1.08; 95% CI: 0.89-1.32; P=0.426), and the rate of being persistent while on-monotherapy 56% higher (HR: 1.56; 95% CI: 1.28-1.90; P< 0.001*).

Conclusion: Following the discontinuation of the first anti-TNF agent, patients with CD who switched to a different class of biologic were more persistent than patients who cycled to another anti-TNF agent. These findings may aid physicians whose patients experience loss of response on the first anti-TNF agent.



[0802] **Figure 1.** CD: Crohn's disease; Std diff: standardized difference; SD: standard deviation; TNF: tumor necrosis factor; 5-ASA: 5-aminosalicylic acid Table: Selected baseline characteristics in weighted switching and cycling cohorts1,2. Notes: (1) cohorts were weighted on baseline characteristics using inverse probability of treatment weights; characteristics considered well balanced if standardized difference is <10%; (2) patients receiving immunomodulators or corticosteroids (at least one episode of ≥90 days of continuous use), patients with CD-related hospitalizations or CD-related surgeries.

Table 1. CD: Crohn's disease

Mean ± SD or n (%)	Switching N=444		Cycling N=441		Std diff (%)
Age	40.4	± 14.2	39.5	± 13.9	6.3
Female	250	(56.3%)	257	(58.4%)	4.3
All-cause costs (US$ 2021)	72,594	± 52,331	71,643	± 53,192	1.8
Prescription drug costs	35,134	± 29,132	34,340	± 30,674	2.7
Total medical costs	37,459	± 51,598	37,303	± 52,046	0.3
Claims-derived CD severity indicator[2]	263	(59.1%)	266	(60.5%)	2.7
Charlson Comorbidity Index	0.54	± 0.9	0.52	± 0.9	1.4
CD-related surgery	38	(8.6%)	37	(8.4%)	0.9
Medication					
Corticosteroids	343	(77.1%)	331	(75.0%)	4.8
≥1 episode with ≥60 days of continuous corticosteroid use	137	(30.9%)	144	(32.7%)	3.9
5-ASA	150	(33.7%)	138	(31.3%)	5.1
Immunomodulators	149	(33.5%)	154	(34.9%)	2.9
Antidiarrheals	26	(5.8%)	27	(6.0%)	0.9
Baseline anti-TNF					
Adalimumab	288	(64.9%)	278	(63.1%)	3.7
Infliximab	140	(31.4%)	148	(33.5%)	4.4
Certolizumab pegol	16	(3.7%)	15	(3.4%)	1.6

Std diff: standardized difference; SD: standard deviation; TNF: tumor necrosis factor; 5-ASA: 5-aminosalicylic acid Table: Selected baseline characteristics in weighted switching and cycling cohorts[1,2]. Notes: (1) 1. Cohorts were weighted on baseline characteristics using inverse probability of treatment weights; characteristics considered well balanced if standardized difference is <10%; (2) Patients receiving immunomodulators or corticosteroids (at least one episode of ≥90 days of continuous use), patients with CD-related hospitalizations or CD-related surgeries

S803 WITHDRAWN

S804

Pilot Study to Assess Pharmacokinetic and Pharmacodynamic Markers Following Enema-Dosing With Adalimumab in Patients With Active Ulcerative Colitis (UC)

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Introduction: The local delivery of drug at the desired site in the gastrointestinal (GI) tract has been a longstanding goal of IBD therapy. Data from topical administration of anti-TNFα antibody in chronic colitis mouse models are promising and show significant efficacy when compared to systemic administration. Here, we investigate the effects of topical dosing of adalimumab in active ulcerative colitis patients.
Methods: Up to 12 eligible patients with active Ulcerative Colitis (fecal calprotectin ≥ 250 ug/g or serum C-reactive protein ≥ 2) received adalimumab enema daily (160mgs/50ml or 80mgs/50 ml) on day 1, 2 and 3 and underwent sigmoidoscopy with biopsy on day 0, 4, 5 and 8. Serum samples were collected on Days 1,2,3,4,5,8 and 30. The endpoints of the study were safety, tissue and blood PK/PD assessment. Tissue, serum, and fecal samples were collected as defined in the protocol. PK and PD were analyzed after each patient has completed dosing. Adalimumab dose were adjusted based on initial PK and PD data for previous subjects.
Results: Administration of adalimumab by enema was well tolerated and did not give rise to any safety concerns. PD data from the initial cohort of patients are presented. All the patients with a Day 0 tissue TNFα measurement and treated with adalimumab enema demonstrated decrease in tissue TNF (average of 6 biopsies) levels at Day 8. The 2 patients who benefited from treatment (patient reported outcomes) also had decrease in tissue IL-6, Oncostatin M, and Phospho/Total STAT 3. Serum (CRP) and fecal markers (Calprotectin) also decreased along with mayo score. The 2 patients who did not report benefit from treatment had increase in tissue IL-6 and Oncostatin M on Day 4 and 8. (Table)
Conclusion: Topical treatment with adalimumab may be beneficial in patients with Active UC. Target engagement and modulation was demonstrated in at least 2 patients. Monitoring tissue TNFa, IL-6 and Oncostatin M might be useful in understanding pathway redundancy or feedback loops. Available data from the literature, and the results of our current work indicate that the topical route of administration has the potential to provide higher exposures of adalimumab in the target tissue in comparison to plasma exposures. In addition, there is lower risk of overexposing the patient systemically while providing expected tissue exposure. These data suggest that targeted administration of adalimumab has the potential to result in pharmacologically relevant tissue levels while reducing systemic side effects.

Table 1. All tissue values are based on an average of 6 biopsies

	Age	Gender	Treatment Dose	Day	Mayo Score	Tissue TNF-α (ng/g)	Tissue IL-6 (ng/g)	Tissue OSM (ng/g)	Fecal Calpro (μg/g)	R/NR Final Visit
Patient 1	26	F	160 mg	0	10	14.9	40.5	24.6	1643	
				4	3	8.1	10.8	4.6		
				8	1	4.49	3.4	4.8	358	
				120					25	R
Patient 2	28	F	160 mg	0	4				2760	
				2/4	2	6.68	35.3	32.2	235	
				8	3	5.08	18.5	10.2		R
Patient 3	29	M	160 mg	0	7	29.8	9.7	43	681	
				4	5	42.1	31.6	24	3143	
				8		29.2	13.2	36.9	754	
Patient 4	67	F	80 mg	0	9	174.4	60.7	13.7	2432	
				4		121	89.6	19	258	
				8		141	346	228	1834	

S805

Efficacy of Upadacitinib Dose Escalation in a Phase 3 Long-Term Extension Ulcerative Colitis Study

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Introduction: Upadacitinib (UPA), an oral selective and reversible JAK inhibitor, recently demonstrated significantly greater therapeutic efficacy compared to placebo (PBO) in patients with moderate to severe ulcerative colitis (UC) during a Phase 3 program.1,2,3 We evaluated the efficacy of dose escalation to UPA 30 mg QD (UPA30) among patients who demonstrated an inadequate response to UPA 15 mg QD (UPA15) during the long-term extension (LTE) study U-ACTIVATE.
Methods: In the UPA UC program, patients who did not achieve a clinical response per Adapted Mayo score at week (wk) 8 in the phase 2 induction study and patients who had inadequate or loss of response in the phase 3 maintenance study could enroll into the 288-wk U-ACTIVATE study and receive open-label UPA15 regardless of their treatment and dose in the precedent studies. (For definitions of loss of response or inadequate response, see Table) Dosing could then be escalated to UPA30 if the patients demonstrated inadequate response to UPA15 and met the criteria for dose escalation. In those with dose escalation prior to wk 48, efficacy endpoints were assessed at wk 48 (the first visit with endoscopy evaluation in U-ACTIVATE) including clinical remission per Adapted Mayo Score, clinical remission per Adapted Mayo Score and corticosteroid (CS)-free remission at wk 48, clinical remission per Adapted Mayo Score at wk 48 and CS-free clinical remission ≥ 90 days prior to the wk 48 visit, endoscopic improvement, and endoscopic remission. All patients who received at least one dose of the study drug (ITT analysis) were included in this study. Results were based on non-responder imputation (NRI-NC) with 95% confidence intervals (CI) calculated by normal approximation to binomial distribution.
Results: The analysis was performed among 190 patients who have completed the wk 48 visit or had entered the study at least prior to wk 48 and the data cut-off. At wk 48, 30.0% achieved clinical remission, 27.9% achieved CS-clinical remission, 15.8% achieved clinical remission at wk 48 and CS-free clinical remission ≥ 90 days prior to the wk 48 visit, 41.1% achieved endoscopic improvement, and 19.5% achieved endoscopic remission.

Conclusion: In patients with an inadequate or loss of response to UPA15, dose escalation to UPA30 was associated with improved efficacy outcomes including clinical remission, CS-free clinical remission, endoscopic improvement, and endoscopic remission.

Table 1. Efficacy of Upadacitinib Dose Escalation in Patients that Entered U-ACTIVATE Long-Term Extension Stud0079

Endpoint	Patients with Dose Escalation, n (%) [95% CI][a]
Clinical remission per Adapted Mayo score[b]	57 (30.0) [63.5, 76.5]
Clinical remission per Adapted Mayo score and corticosteroid-free remission at wk 48[c]	53 (27.9) [65.7, 78.5]
Clinical remission per Adapted Mayo score at wk 48 and corticosteroid-free clinical remission ≥ 90 days prior to the wk 48 visit[c]	30 (15.8) [79.0, 89.4]
Endoscopic improvement[d]	78 (41.1) [52.0, 65.9]
Endoscopic remission[e]	37 (19.5) [74.9, 86.2]

The criteria for a loss of response or an inadequate response depended on the patient's response at wk 0. For patients who were responders upon completion of U-ACHIEVE Maintenance wk 44, an inadequate response was defined as: a stool frequency subscore (SFS) and rectal bleeding subscore (RBS) at least 1 point greater than the wk 0 value on two consecutive visits at least 7 days apart; or •F020For patients with SFS or RBS ≥ 2.1 at wk 0, loss of response is defined as an increase in either the SFS or RBS of at least 1 point greater than the wk 0 value on two consecutive visits at least 7 days apart and associated with the presence of signs/symptoms of UC progression of UC disease.
•F020For patients enrolled from U-ACHIEVE Maintenance due to loss of response, inadequate response was defined as: SFS + RBS value that remains unchanged or has increased from wk 0 on two consecutive visits at least 7 days apart.
[a]Non-responder imputation with no special data handling for missing due to COVID-19 was applied. 95% CI calculated by normal approximation to binomial distribution.
[b]Clinical remission per Adapted Mayo score: SFS≤1 and not greater than baseline (of induction), RBS=0, and endoscopic subscore (ES) ≤ 1.
[c]Clinical remission per Adapted Mayo score and CS-free clinical remission (clinical remission at wk 48 and CS-free for ≥90 days prior to wk 48 among patients with clinical remission at the end of the induction therapy).
[d]Endoscopic improvement: ES ≤ 1
[e]Endoscopic remission: ES= 0.

S806

Impact of Biologics Therapy on the Prevalence of Pregnancy Complications Among Women With Inflammatory Bowel Disease: A Nationwide Population-Based Study

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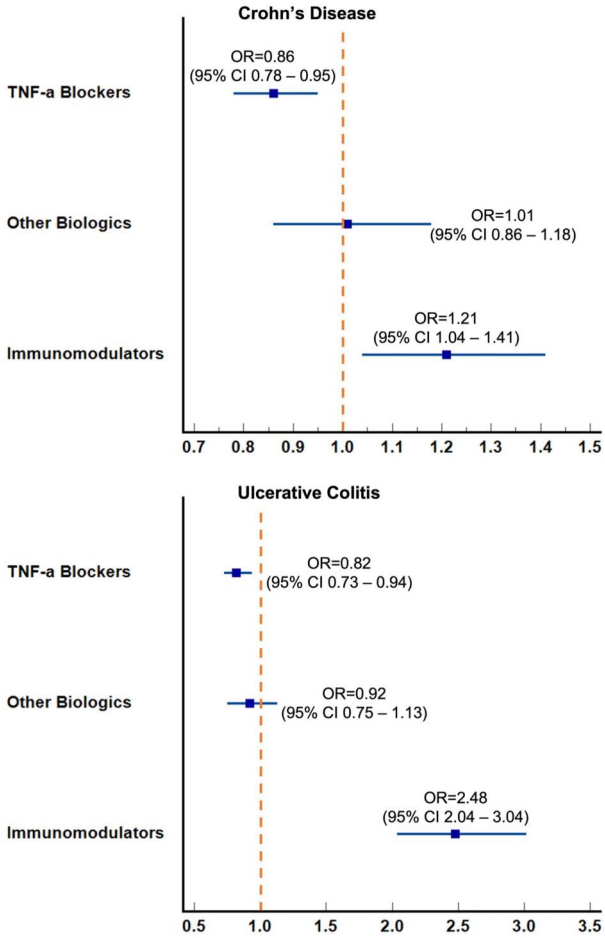
Introduction: Inflammatory bowel disease (IBD) typically coincides with childbearing years in women. IBD has been established as an independent risk factor for pregnancy complications (PC) and adverse pregnancy outcomes. Biologics have been shown to decrease inflammation among IBD patients however its implications on pregnancy outcomes remain unclear. We sought to compare the prevalence of PC among individuals with or without IBD and to assess whether the risk of PC among patients with IBD is altered by biologics therapy.
Methods: We used the IBM Explorys clinical database which includes over 74 million de-identified unique patients across 300 hospitals in the United States. Patient were identified using SNOMED and ICD codes. We included female patients in childbearing age between 18 – 50 years, with history of pregnancy and diagnosis of either Crohn's disease (CD) or ulcerative colitis (UC). We investigated the prevalence of PC in IBD patients compared to patients with no IBD. PC included pre-eclampsia, pre-term labor and miscarriages. Also, we compared the prevalence of PC in IBD patients who received biologics therapy against other treatment modalities. Odds ratios with 95% confidence intervals were calculated to evaluate the risk of pregnancy complications.
Results: Among our cohort of women with history of pregnancy, we identified 23,830 patients with CD and 19,220 patients with UC, of whom 6,550 (27.5%) and 5,520 (28.7%) developed PC, respectively compared to 18.8% in women without IBD, p< 0.0001 to all. Both CD [OR: 1.64; 95% CI: 1.59 – 1.69] and UC [OR: 1.74; 95%CI: 1.69 – 1.80] patients had a significant higher risk of PC compared to patients without IBD. 2,870 (12.0%) patients with CD and 1,520 (7.9%) patients with UC received biologics therapy. Sub-group analysis of the biologics-treated cohort was associated with a significantly lower risk of developing PC in CD [OR: 0.87; 95%CI: 0.79 – 0.95] and UC [OR: 0.81; 95%CI: 0.72 – 0.92], respectively (Figure).
Conclusion: In this large retrospective study, we found that the prevalence of pregnancy complications in women with IBD was significantly higher than the general population. Furthermore, we found that IBD patients treated with biologics were significantly less likely to be associated with pregnancy complications. Further studies are required to determine whether biologics therapy may mitigate pregnancy complications risk.



[0806] **Figure 1.** Logistic Regression of pregnancy complications risk in IBD, IBD; inflammatory bowel disease. Immunomodulators included azathioprine, methotrexate and mercaptopurine. Other biologics included natalizumab, ustekinumab and vedolizumab. TNF-a Blockers; tumor necrosis factor-alpha blocker.

Table 1. Demographics of patients with IBD and PC

Variable	Patients with Pregnancy Complications		No Pregnancy Complications N=2,413,580 (%)
	With IBD N=8,210 (%)	Without IBD N=552,000 (%)	
Age >35	4960 (60.4%)	333,810 (60.5%)	1,322,060 (54.8%)
Caucasian	6,460 (78.7%)	337,470 (61.1%)	1,386,960 (57.5%)
Smoker	2,180 (26.6%)	72,990 (13.2%)	222,460 (9.2%)
Alcohol Abuse	230 (2.8%)	12630 (2.3%)	35,300 (1.5%)
T2DM	610 (7.4%)	32,660 (5.9%)	82,280 (3.4%)
Hyperlipidemia	1,680 (20.5%)	43,590 (7.9%)	125,010 (5.2%)
HTN	280 (3.4%)	13,460 (2.4%)	28,800 (1.2%)
CAD	580 (7.1%)	3,870 (0.7%)	13,860 (0.6%)
Obesity	4,750 (57.9%)	127,470 (23.1%)	355,890 (14.7%)
Intestinal Resection	880 (10.7%)	7,410 (1.3%)	24,130 (1.0%)
Colectomy	540 (6.6%)	6,170 (1.1%)	20,350 (0.8%)
Pre-eclampsia	1,570 (19.1%)	113,220 (20.5%)	NA
Pre-term Labor	2,910 (35.4%)	116,860 (21.2%)	NA
Miscarriage	4,930 (60.0%)	365,420 (66.2%)	NA

IBD; inflammatory bowel disease, PC; pregnancy complications, T2DM; type 2 diabetes mellitus; HTN; hypertension, CAD; coronary artery disease.

S807

Corticosteroid-Sparing Effects of Ustekinumab Therapy for Ulcerative Colitis Through 4 Years: UNIFI Long-Term Extension

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Introduction: Ustekinumab (UST) is an IL-12/23p40 inhibitor approved for treatment of Crohn's disease and ulcerative colitis (UC). In the UNIFI maintenance study of patients (pts) with moderate to severe UC, > 90% of pts who achieved clinical response or remission at week (wk) 44 were not receiving corticosteroids, an important therapeutic goal. In this analysis, we describe the corticosteroid-sparing effects of UST treatment through 4 years (yrs) among pts who were treated in the UNIFI long-term extension (LTE).
Methods: Overall, 523 intravenous UST induction responders were randomized to subcutaneous (SC) maintenance therapy (placebo [PBO], n=175; UST 90mg every 12 wks [q12w], n=172; or UST 90mg q8w, n=176). A total of 284 UST pts completed wk44 and were treated in the LTE. PBO pts were discontinued after study unblinding. Based on investigator's clinical judgement of UC disease activity, pts in the LTE were eligible to receive a dose adjustment starting at wk56: PBO to q8w, q12w to q8w, and q8w to q8w (sham adjustment). Pts in PBO or q8w groups were only eligible for dose adjustment or sham dose adjustment before unblinding. Efficacy was evaluated using symptomatic remission (Mayo stool frequency subscore of 0 or 1 and a rectal bleeding subscore of 0). During the maintenance study, all pts receiving corticosteroids at maintenance baseline were required to initiate tapering. Through wk200 of the LTE, symptomatic remission endpoints were calculated with treatment failure and missing data nonresponder imputation, and dose adjustment was not considered to be a treatment failure. Missing corticosteroid dose data were managed using last observation carried forward.
Results: Of the 284 pts randomized to UST and treated in the LTE, 139 were receiving corticosteroids at maintenance baseline. Of these, 79.1% (n=110) were no longer receiving corticosteroids at wk200. Rates of corticosteroid-free symptomatic remission at wk200 were generally similar for the q8w and q12w maintenance doses (Table). Of the UST-treated pts in symptomatic remission at wk200, 94/96 (97.9%) in the q12w group and 91/96 (94.8%) in the q8w group were corticosteroid free.
Conclusion: UST maintenance therapy, with both q8w and q12w dosing regimens, was effective in reducing and eliminating the use of corticosteroids in pts with UC through 4 yrs. The majority of pts in symptomatic remission were corticosteroid free through 4 yrs of treatment with UST.

Table 1. Symptomatic remission and corticosteroid-sparing effects in patients who were randomized to UST in maintenance and were treated in the long-term extension

Analysis	90 mg UST SC q12w[a]	90 mg UST SC q8w[a]	Combined UST[a]
Randomized patients in maintenance who were treated in the LTE, N	141	143	284
Patients in symptomatic remission, n/N (%)[d,e,f]			
Week 44	117/141 (83.0)	119/143 (83.2)	236/284 (83.1)
Week 200	96/141 (68.1)	96/143 (67.1)	192/284 (67.6)
Patients in symptomatic remission and not receiving corticosteroids, n/N (%)[b,d,e,f]			
Week 44	111/141 (78.7)	115/143 (80.4)	226/284 (79.6)
Week 200	94/141 (66.7)	91/143 (63.6)	185/284 (65.1)
Patients in symptomatic remission and not receiving corticosteroids among patients receiving corticosteroids at maintenance baseline, n/N (%)[b,c,d,e,f]			
Week 44	49/68 (72.1)	56/71 (78.9)	105/139 (75.5)
Week 200	39/68 (57.4)	47/71 (66.2)	86/139 (61.9)
Patients who were able to eliminate the use of corticosteroids, n/N (%)[b,c]			
Week 44	61/68 (89.7)	64/71 (90.1)	125/139 (89.9)
Week 200	53/68 (77.9)	57/71 (80.3)	110/139 (79.1)

LTE, long-term extension; q8w, every 8 weeks; q12w, every 12 weeks; SC, subcutaneous; UST, ustekinumab.
[a]Randomized group at maintenance Week 0 regardless of whether patients had a dose adjustment during the LTE.
[b]Patients who had a missing value in corticosteroid use at the designated visit had their last available value carried forward to the designated visit.
[c]Denominator is the number of patients who were receiving concomitant corticosteroids at maintenance baseline.
[d]Symptomatic remission is defined as a stool frequency subscore of 0 or 1 and a rectal bleeding subscore of 0.
[e]Patients who had both stool frequency and rectal bleeding subscores missing at a visit were considered not to be in symptomatic remission for that visit.
[f]Patients who had an ostomy or colectomy, or discontinued study agent due to lack of therapeutic effect or due to an adverse event of worsening of ulcerative colitis prior to the designated visit were considered not to be in symptomatic remission.

S808

Level and Change of CRP Are Associated With 30-Day Risk of Colectomy in Patients Hospitalized With Acute Severe Ulcerative Colitis Receiving Infliximab

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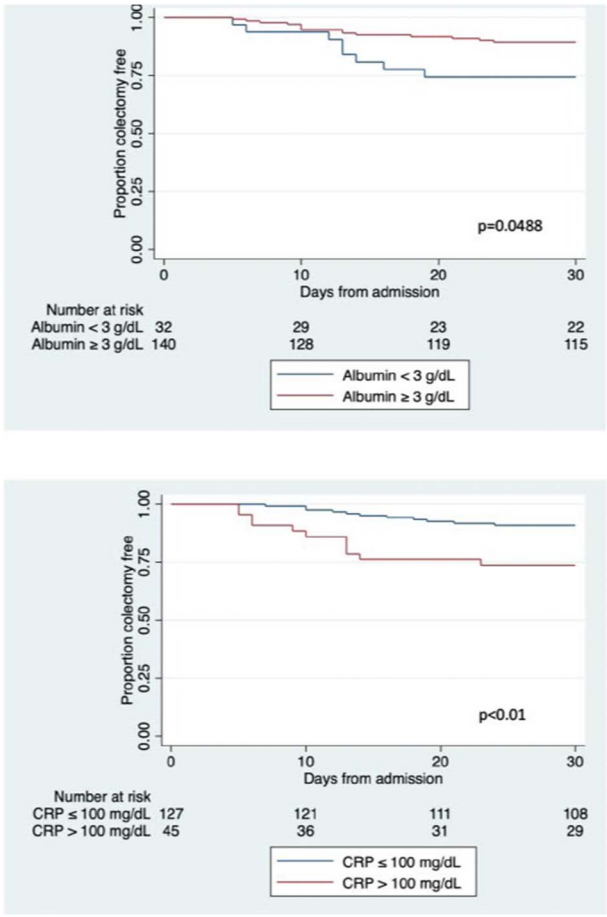
Introduction: Infliximab (IFX) has been efficacious in reducing colectomy rates among patients with moderate-to severe ulcerative colitis, but predictors of colectomy within 30 days of IFX among patients with acute severe ulcerative colitis (ASUC) are less established.
Methods: We performed a single-center retrospective analysis of patients who received at least one dose of IFX while admitted between 2011-2022. We assessed demographic, clinical and laboratory predictors of colectomy within 30 days of first IFX dose. Multivariable and time-to-event analysis using Kaplan-Meier with log-rank statistics were used to assess risk factors for colectomy within 30 days.
Results: A majority of the 172 patients hospitalized with ASUC who received IFX received 10 mg/kg (87.79%). Overall, 22/172 patients (12.79%) underwent colectomy within 30 days of first IFX dose. On univariable analysis, age, sex, race, ethnicity, BMI and smoking status were not associated with risk of colectomy. Higher initial CRP was significantly associated with 30-day risk of colectomy (106.17 vs. 65.10 mg/dL among patients who did not undergo colectomy; p< 0.01), as was a decrease of CRP ≤50% prior to discharge (p< 0.01). Lower initial albumin [< 3 (36.36%), 3.0-3.5 (40.91%), >3.5 g/dL (22.73%)] was associated with our primary outcome (p=0.046), as was a higher number of bowel movements in a 24-hour period prior to discharge (5.6 vs. 3.9 among patients who did not undergo colectomy; p=0.0256). On multivariable analysis, higher initial CRP (aOR 1.01, 95% CI 1.00 – 1.02), ≤50% change in CRP after first dose of IFX (aOR 9.00, 95% CI 2.43 – 33.29) and higher number of bowel movements in a 24-hour period prior to discharge (aOR 1.24, 95% CI 1.01– 1.52) remained significantly associated with risk of colectomy when adjusting for relevant covariables (Table). On Kaplan-Meier analysis, initial CRP >100 mg/dL, albumin < 3 g/dL and change in CRP ≤50% prior to discharge were significantly associated with decreased time to colectomy (Figure).
Conclusion: Among patients with ASUC, higher CRP, decrease of CRP ≤50% and higher number of bowel movements prior to discharge were associated with increased risk of colectomy within 30-days of receiving IFX. Initial CRP >100 mg/dL, albumin < 3 g/dL and decrease of ≤50% in CRP prior to discharge were associated with decreased time to colectomy. These results can identify patients at highest risk and impact clinical decision-making regarding need for and timing of colectomy in patients with ASUC receiving IFX.



[0808] **Figure 1.** Kaplan–Meier curve showing estimates of proportion of patients requiring colectomy within 30 days of first infliximab dose (A) comparing patients with albumin on admission < 3 g/dL and albumin on admission ≥ 3 g/dL (p=0.0488) and (B) comparing patients with CRP on admission > 100 mg/dL and CRP on admission ≤ 100 mg/dL (p<0.01).

Table 1. Multivariable Analysis Examining Predictors of Colectomy within 30 Days Among Patients Hospitalized with Acute Severe Ulcerative Colitis Receiving Infliximab. *p=0.015; **p<0.01; ***p=0.036

Variable	$_{adj}$Odds Ratio (95% Confidence Interval)
Disease Duration (years)	0.95 (0.86 – 1.04)
Family history of IBD	
No	Reference
Yes	0.53 (0.10 – 2.79)
Extent of disease on admission	
Proctitis/Left sided colitis	Reference
Not documented	0.13 (0.01 – 2.04)
Pancolitis	1.30 (0.35 – 4.85)
GI infection	
No	Reference
Yes	2.13 (0.51 – 8.91)
CRP on admission (mg/dL)*	1.01 (1.00 – 1.02)
Serum albumin on admission	
>3.5 g/dL	Reference
3-3.5 g/dL	1.83 (0.47 – 7.12)
< 3 g/dL	3.77 (0.79 – 18.07)
Percent change in CRP after first infliximab dose**	
>50% decrease	Reference
≤50% decrease	9.00 (2.43 – 33.29)
Number of bowel movements in 24-hour period prior to discharge***	1.24 (1.01– 1.52)

S809

Impact of Biologics Therapy on the Prevalence of Parkinson's Disease Among Patients With Inflammatory Bowel Disease: A Nationwide Population-Based Study

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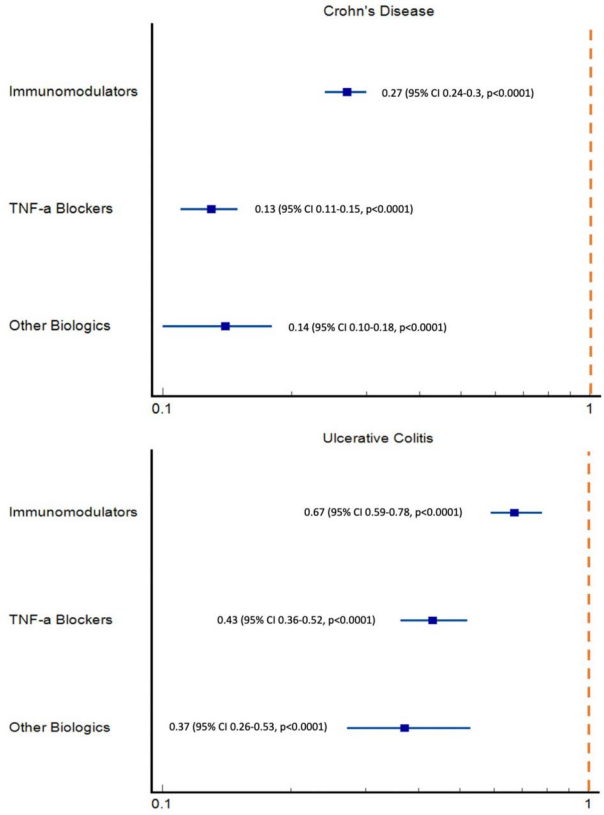
Introduction: Inflammatory bowel disease (IBD) and Parkinson's disease (PD) are chronic progressive disorders that mainly affect different organs: the gut and brain, respectively. Increasing evidence supports reciprocal communication between the enteric and the central nervous system in disease, termed the 'gut-brain axis'. Biologics have been shown to decrease inflammation among IBD patients however the long-term neurological implications remain unclear. We sought to compare the prevalence of PD among individuals with or without IBD and to assess whether PD risk among patients with IBD is altered by biologics therapy.
Methods: We used the IBM Explorys clinical database which includes over 74 million de-identified unique patients across 300 hospitals in the United States. Patient were identified using SNOMED and ICD codes. We identified all patients (age >18 years) who were diagnosed with either Crohn's disease (CD) or ulcerative colitis (UC). We investigated the prevalence of PD in IBD patients compared to patients with no IBD. Also, we compared the prevalence of PD between IBD patients with and without anti-TNF therapy. Odds ratios with 95% confidence intervals were calculated to evaluate the risk of PD.
Results: We identified 249,480 patients with CD and 209,030 patients with UC, of whom 7,180 (2.88%) and 2,700 (1.29%) developed PD, respectively compared to 0.37% in individuals without IBD, (Table) p< 0.0001 to all. Both CD [OR: 7.91; 95% CI: 7.73-8.10] and UC [OR: 3.44; 95%CI: 3.31-3.57] patients had a significantly higher risk of PD compared to patients without IBD. 45,030 (18.0%) patients with CD and 23,110 (11.1%) patients with UC received biologics therapy. Sub-group analysis of the biologics-treated cohort was associated with a significantly lower risk of developing PD in CD [OR: 0.13; 95%CI: 0.11-0.13] and UC [OR: 0.40; 95%CI: 0.34-0.49], respectively (Figure).
Conclusion: In this large retrospective study, we found that the prevalence of PD in patients with IBD was significantly higher than the general population. Furthermore, we found that IBD patients treated with biologics were significantly less likely to be diagnosed with PD. These findings may support a role of systemic inflammation in the pathogenesis of both diseases. Further studies are required to determine whether biologics therapy may mitigate PD risk.



[0809] **Figure 1.** Logistic Regression of Parkinson's disease Risk in IBD, IBD; inflammatory bowel disease. Immunomodulators included Azathioprine, Methotrexate and Mercaptopurine. Other biologics included Natalizumab, Ustekinumab and Vedolizumab. TNF-a Blockers; tumor necrosis factor-alpha blocker.

Table 1. Demographics of patients with IBD and PD

Variable	Patients with PD		No PD
	With IBD	Without IBD	
N	9050	259900	70129700
18-65	3310 (36.6%)	26610 (10.2%)	47,919,160 (68.3%)
>65	5600 (61.9%)	226030 (87.0%)	21,034,720 (30.0%)
Female	5210 (57.6%)	112100 (43.1%)	38,353,970 (54.7%)
Caucasian	7710 (85.2%)	200420 (77.1%)	37,649,020 (53.7%)
T2DM	3160 (34.9%)	74510 (28.7%)	5,575,570 (8.0%)
Primary HTN	6200 (68.5%)	174330 (67.1%)	14,014,310 (20.0%)
Hyperlipidemia	7700 (85.1%)	144590 (55.6%)	11,635,480 (16.6%)
Obesity	2700 (29.8%)	36170 (13.9%)	5,404,010 (7.7%)

Table 1. (*continued*)

Variable	Patients with PD		No PD
	With IBD	Without IBD	
Tobacco Abuse	3710 (41.0%)	22280 (8.6%)	3,789,760 (5.4%)
Cannabis Abuse	280 (3.1%)	1540 (0.6%)	528,780 (0.75%)
Alcohol Abuse	670 (7.4%)	6530 (2.5%)	1,083,540 (1.55%)
Carbidopa-levodopa	2030 (22.4%)	130470 (50.2%)	NA
Dopamine agonists	2470 (27.3%)	145230 (55.9%)	NA
MAO-B inhibitors	310 (3.4%)	22630 (8.7%)	NA

IBD; inflammatory bowel disease, PD; Parkinson's disease, T2DM; type 2 diabetes mellitus; HTN; hypertension, MAO-B inhibitors; mono-amine oxidase B inhibitors.

S810

Efficacy Outcomes by Symptom-Based Response Status After Induction: Week-48 Results from the GALAXI 1 Trial of Guselkumab in Crohn's Disease

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Introduction: The GALAXI 1 study evaluated the efficacy and safety of guselkumab (GUS) in patients (pts) with moderate to severe Crohn's disease (CD). The study employed a "treat-through" design in which all pts randomized to active treatment continued that treatment through week (Wk) 48, regardless of response to intravenous (IV) induction. Here, we report a *post hoc* analysis of clinical and endoscopic efficacy outcomes to GUS maintenance treatment in pts with symptom-based response to induction treatment.
Methods: Pts were randomized 1:1:1:1:1 to induction with GUS 200, 600, or 1200mg IV, ustekinumab (UST) ~6mg/kg IV, or PBO IV. At Wk12, pts transitioned to maintenance dosing as follows: GUS 200mg IVà100mg SC q8w, GUS 600mg IVà200mg SC q4w, GUS 1200mg IVà200mg SC q4w, UST ~6mg/kg IVà90mg SC q8w, PBO CDAI clinical non-respondersàUST ~6mg/kg IVà90mg SC q8w, and PBO CDAI clinical responders àPBO SC q4w. Response to induction was defined as ≥30% decrease from baseline to Wk12 in average daily stool frequency and/or abdominal pain score and both not worse than baseline. Analyses of Wk48 endpoints were prespecified but not controlled for multiplicity. The study was not powered to evaluate differences in efficacy among treatment groups at Wk48 and UST was used as a reference arm.
Results: Of pts in the primary efficacy analysis set, 43/61 (70%), 46/63 (73%), and 41/61 (67%) in the respective GUS 200, 600, and 1200mg groups, 45/63 (71%) in the UST group, and 23/61 (38%) in the PBO group exhibited response to induction. Percentages of pts in response after induction who achieved clinical remission at Wk48 ranged from 63% to 89% among GUS dose groups compared with 57% to 73% in the overall population (Table). Most pts in clinical remission at Wk48 were also in corticosteroid-free remission. PRO-2 remission rates at Wk48 among pts in response after induction ranged from 59% to 80%, and CDAI clinical response rates ranged from 73% to 96%. Endoscopic response rates ranged from 49% to 56%.
Conclusion: This *post hoc* analysis of a study with a "treat-through" design showed that pts randomized to GUS who were in symptom-based response after induction were more likely to achieve clinical and endoscopic outcomes at Wk48 compared with the overall population, regardless of the induction dose received. The "treat-through" study design allows for the evaluation of outcomes during maintenance in all pts randomized to treatment, rather than only induction responders.

Table 1. **Efficacy Outcomes at Week 48 Overall and in Patients with Symptom-based Response to Induction Treatment**

	Guselkumab						Ustekinumab ~6 mg/kg IV à90 mg SC q8w	
	200 mg IV à100 mg SC		600 mg IV à 200 mg SC		1200 mg IV à200 mg SC			
	Overall[a]	Resp[a]	Overall[a]	Resp[a]	Overall[a]	Resp[a]	Overall[a]	Resp[a]
N	61	43	63	46	61	41	63	45
CDAI clinical remission (CDAI score < 150)[b, c]	64%	72%	73%	89%	57%	63%	59%	69%
Corticosteroid-free CDAI clinical remission (CDAI score < 150 at Wk 48 and not receiving corticosteroids at Wk 48)[b, c]	59%	67%	71%	87%	56%	61%	59%	69%
PRO-2 remission (unweighted CDAI component of daily average AP score ≤1 AND the unweighted CDAI component of daily average SF ≤3, and no worsening of AP or SF from baseline)[b, c]	57%	63%	70%	80%	51%	59%	46%	51%
CDAI clinical response (≥100-point reduction from baseline in CDAI score or CDAI score < 150)[b, c]	74%	81%	84%	96%	67%	73%	68%	78%
Endoscopic response (≥50% improvement from baseline in SES-CD or SES-CD ≤2)[b, c]	44%	49%	46%	54%	44%	56%	30%	31%

AP=Abdominal pain; CDAI=Crohn's disease activity index; IV=Intravenous; PRO-2=Patient-reported CDAI components of abdominal pain and stool frequency; SC=subcutaneous; SES-CD=Simple Endoscopic Score for Crohn's Disease; Wk=week.
[a]"Overall" defined as all randomized patients who were in the primary efficacy analysis set of the treat-through study; "Resp" defined as ≥30% decrease from baseline at Wk12 in average daily SF and/or AP score and both not worse than baseline.
[b]Patients who had a prohibited change in concomitant CD medication, a CD-related surgery, or discontinued study agent due to lack of efficacy, or an adverse event of worsening CD prior to the designated analysis timepoint, were considered not to have achieved the endpoint.
[c]Patients who had insufficient data to calculate the outcome measure at the designated analysis timepoint were considered not to have achieved the endpoint.

S811

Evaluation of Ozanimod Efficacy and Safety in Older Patients With Ulcerative Colitis: Post Hoc Analysis From the Phase 3 True North Study

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Introduction: Ozanimod (OZA), an oral S1P receptor modulator, is approved for the treatment (tx) of moderate/severe ulcerative colitis (UC) in the US and EU. Inflammatory bowel disease prevalence is increasing in older pts.

Methods: This post hoc analysis examined OZA efficacy and safety in pts < 60y and ≥60y in True North (TN). Pts were randomized to double-blind (DB) OZA 0.92 mg or placebo (PBO; Cohort 1 [C1]) or received open-label OZA (Cohort 2 [C2]) during the 10-week (W) TN induction period (IP). Pts with clinical response to OZA at W10 were rerandomized to DB OZA or PBO in the maintenance period (MP) through W52.
Results: This analysis included 562 pts < 60y (OZA, n=376; PBO, n=186) and 83 pts ≥60y (OZA, n=53; PBO, n=30) from C1 and 315 pts (< 60y) and 52 pts (≥60y) from C2. During MP, 196 pts (< 60y) and 34 pts (≥60y) continued on OZA; 196 pts (< 60y) and 31 pts (≥60y) were rerandomized to PBO. Demographics and baseline (BL) characteristics were generally well balanced across tx and age groups; older pts had less extensive disease, lower BL fecal calprotectin levels, and more polypharmacy. Adjusted tx differences favored OZA v PBO and were generally similar between age groups across all efficacy endpoints (clinical remission, clinical response, endoscopic improvement, mucosal healing) at W10 and W52. PBO response rates were higher in older v younger pts. During IP, tx-emergent adverse event (TEAE) incidence with OZA in C1 and C2 was lower in older pts; rates of serious TEAEs and TEAEs leading to tx discontinuation were similar in older v younger pts (Table). With continued OZA tx during MP, TEAEs occurred more often in older pts, serious TEAEs were less frequent in older pts, and TEAEs leading to tx discontinuation were similar in older v younger pts. Adverse events of special interest during MP were generally low overall, with the most common being infection (≥60y: 2 pts v < 60y: 3 pts), hepatic effects (≥60y: 0 pts v < 60y: 2 pts), macular edema (≥60y: 1pt v < 60y: 0 pts), malignancy (≥60y: 0 pts v < 60y: 2 pts), and pulmonary effects (≥60y: 0 pts v < 60y: 1 pt). One death from acute respiratory distress syndrome due to viral pneumonia occurred during IP in an older pt (64y) on OZA but was deemed unrelated to tx.
Conclusion: OZA is a safe, tolerable, oral tx option for older UC pts with an absence of serious AEs of concern. OZA efficacy in older pts was comparable to younger pts. This study was limited by the small sample size, warranting larger future real-world studies.

Table 1. TEAEs in older and younger pts on OZA in TN

TEAE, n (%)	< 60 y			≥60 y		
	IP C1: OZA (n=376)	IP C2: OZA (n=315)	MP: OZA-OZA (n=196)	IP C1: OZA (n=53)	IP C2: OZA (n=52)	MP: OZA-OZA (n=34)
≥1 TEAE	153 (41%)	130 (41%)	94 (48%)	19 (36%)	16 (31%)	19 (56%)
≥1 serious TEAE	14 (4%)	21 (7%)	11 (6%)	3 (6%)	2 (4%)	1 (3%)
≥1 TEAE leading to tx discontinuation	13 (3.5%)	11 (3.5%)	2 (1%)	1 (2%)	3 (6%)	1 (3%)

S812

Hepatic Safety of Ozanimod in Ulcerative Colitis and Relapsing Multiple Sclerosis Phase 3 Trials

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Introduction: Ozanimod (OZA) is a sphingosine 1-phosphate (S1P) receptor modulator approved for the treatment of moderately to severely active ulcerative colitis (UC) and relapsing forms of multiple sclerosis (MS) in the United States and European Union. Other S1P receptor modulators have shown substantial elevations in hepatic enzymes.
Methods: The impact of OZA on liver function tests was assessed in this safety analysis from phase 3 UC and MS trials. In the 52-week (10-week induction period and 42-week maintenance period), randomized True North (TN) trial, patients (pts) with moderately to severely active UC were treated with placebo (n=216) or OZA 0.92 mg (equivalent to OZA HCl 1 mg) (n=796). In the randomized MS trials (SUNBEAM and RADIANCE), MS pts were treated with interferon beta-1a 30 μg (n=885) or OZA (n=882) for 12 and 24 months, respectively. Hepatic enzymes were assessed at baseline and Weeks 5, 10, 18, 28, 40, and 52 in TN, and at baseline and every 3 months for the MS trials. In the UC and MS trials, enzyme elevations were confirmed with a repeated test within 14 days.
Results: Percentages of pts on OZA 0.92 mg with elevations in alanine transaminase (ALT), aspartate aminotransferase (AST), and bilirubin are shown in the Table; < 6% and < 2% of pts had ALT and AST elevations ≥3 x upper limit of normal (ULN), respectively, and < 2% had bilirubin elevations >2 x ULN. Of those with ALT ≥3 x ULN, 86.4% (19/22) of UC pts and 85.4% (41/48) of MS pts recovered to ALT < 3 x ULN within 3 months. Most hepatic treatment-emergent adverse events (TEAEs) were mild to moderate in UC and MS pts. In TN, 3 (0.4%) pts on OZA reported a hepatobiliary disorder TEAE, 1 (0.1%) of whom had hyperbilirubinemia. In the MS trials, 15 (1.7%) pts on OZA 0.92 mg reported a hepatobiliary disorder TEAE, 3 (0.3%) of whom had hyperbilirubinemia. Hepatic-related events leading to discontinuation, which were generally asymptomatic laboratory abnormalities, were reported in 4 (0.5%) UC pts and in 11 (1.2%) MS pts on OZA 0.92 mg. No serious hepatic TEAEs, Hy's law cases, or severe drug-induced hepatocellular injuries occurred with OZA 0.92 mg in any of the trials.
Conclusion: In this analysis of phase 3 UC and MS trials with OZA, elevations of aminotransferases and bilirubin occurring with OZA were infrequent, generally asymptomatic, and transient. These elevations, which generally resolved without study drug discontinuation, did not meet the criteria for Hy's law or protocol-defined serious AEs.

Table 1. Maximum postbaseline ALT, AST, and bilirubin levels with OZA 0.92 mg

	Parameter	TN (UC) (n=783)	Sunbeam/Radiance (MS) (n=878)
ALT	>1 × ULN	215 (27.5)	373 (42.5)
	≥3 × ULN	22 (2.8)	48 (5.5)
	≥5 × ULN	8 (1.0)	14 (1.6)
AST	>1 × ULN	136 (17.4)	185 (21.1)
	≥3 × ULN	14 (1.8)	9 (1.0)
	≥5 × ULN	5 (0.6)	5 (0.6)
Bilirubin	>1 × ULN	32 (4.1)	122 (13.9)
	>2 × ULN	3 (0.4)	14 (1.6)
	>3 × ULN	1 (0.1)	3 (0.3)

S813

Venous Thromboembolism Rates Among Patients Hospitalized for Inflammatory Bowel Disease Exacerbation: A Time Trend Analysis of the National Inpatient Sample

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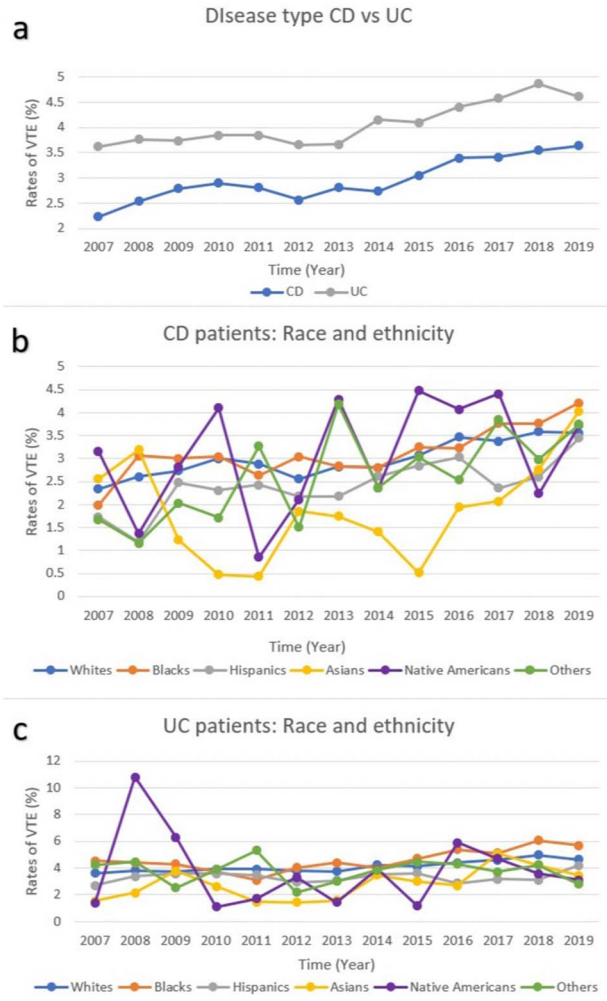
Introduction: Inflammatory bowel disease (IBD) flare increases risk of venous thromboembolism (VTE) events, especially during hospitalization. Guidelines, support the use of VTE prophylaxis for these patients, but it is unclear if this has impacted rates of VTE. Our goal was to assess time trends of VTE rates among IBD admissions.
Methods: Patients hospitalized from 2007 to 2019 were identified in the National Inpatient Sample (NIS) by International Classification of Diseases (ICD), 9th and 10th Revision codes. Patients with IBD flare were selected by either a) a primary diagnosis of Crohn's disease (CD) or Ulcerative colitis (UC) or b) a secondary diagnosis of CD or UC with a primary diagnosis of a gastrointestinal manifestations of IBD: abdominal pain, anemia, malnutrition, or dehydration. Hospitalizations for VTE were identified by those with a primary or secondary diagnosis of VTE. Patients with chronic thrombosis or prior VTE were excluded. Incidence of VTE was assessed by disease type (CD vs. UC) and by racial/ethnic identification: white, black, Hispanic, Asian or Pacific Islander, Native American, other. Cochran-Armitage trend tests were used for binary variables while trends for variables with reported mean averages used linear regression. The Rao-Scott design-adjusted chi-square test was used to evaluate the association between binary variables and the diagnosis of IBD in patients with VTE.

Results: 131,541 weighted cases were admitted for an IBD flare complicated by VTE; 73,530 had CD and 58,011 had UC, Table. VTE prevalence was higher among patients with UC compared to CD, 42.6 vs. 30.7 per 1,000 hospitalizations, respectively. Over the study period, the rates of VTE in IBD hospitalizations increased, from 3.58% to 4.62% for UC ($p< 0.0001$) and from 2.22% to 3.66% for CD ($p< 0.0001$), Figure 1a. Black patients with IBD were found to be at higher risk of VTE (aOR 1.075, $p=0.002$), while Hispanic and Asian / Pacific Islanders had lower risk for developing VTE when compared to Whites (aOR 0.873 and 0.658, respectively; $p< 0.0001$). Aside from Hispanic and Native American UC patients, all races and ethnicities had increasing trends of VTE during the study period, Figure 1b, 1c.
Conclusion: IBD admissions complicated by VTE have significantly increased. Though increasing awareness of VTE with IBD flare may have resulted in additional diagnoses, the study findings suggest that current VTE prophylaxis, or utilization of VTE prophylaxis, may be inadequate for those hospitalized for IBD flare.



[0813] **Figure 1.** VTE rates as % of total IBD hospitalizations per year.

Table 1. Patient Demographics and Hospital Characteristics of IBD Patients Admitted with VTE

Variable	Crohn's Disease (n=73,530)	Ulcerative Colitis (n=58,011)
Age in years [Mean(SD)]	56 (0.16)	60 (0.19)
Sex		
Male	43.7%	50.3%
Female	56.3%	49.7%
Race*		
White	81.1%	79.6%
Black	12.3%	10.4%
Hispanic	3.8%	6.1%
Asian / Pacific Islander	0.5%	1.1%
Native American	0.4%	0.4%
Other	1.9%	2.5%
Insurance Type		
Medicare	48.5%	48.9%
Medicaid	12.5%	8.8%
Private Insurance	32.7%	36.4%

Table 1. (*continued*)

Variable	Crohn's Disease (n=73,530)	Ulcerative Colitis (n=58,011)
Self-Pay	3.2%	2.8%
Other	3.1%	3.1%
Hospital Bed Size		
Small	13.8%	13.5%
Medium	25.1%	24.8%
Large	61.1%	61.7%
Hospital Location/ Type		
Rural	7.2%	6.1%
Urban Nonteaching	28.0%	28.9%
Urban Teaching	64.8%	65.0%
Charlson Comorbidity Index		
CCI = 0	36.4%	35.5%
CCI = 1	21.8%	21.3%
CCI = 2	15.5%	14.7%
CCI ≥ 3	26.3%	28.6%
Hospitalization Cost	$95,500	$110,473
Length of Stay (in mean days)	10.39	11.25
Death (per 1,000 hospitalizations)	41.8	61.4

*There were some charts where race was documented in NIS as unknown.

S814

Bile Acid Malabsorption Is a Common Risk Factor for Diarrhea in Adults With Mucosal Healing in Crohn's Disease

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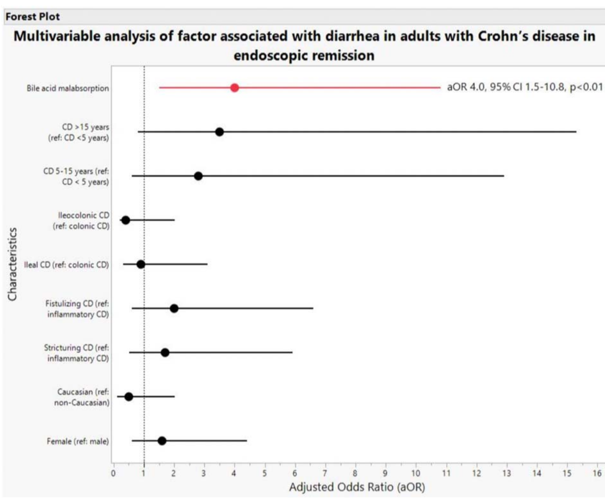
Introduction: Bile acid malabsorption (BAM) accounts for over one-quarter of patients with diarrhea-predominant irritable bowel syndrome (IBS-D) and chronic diarrhea. However, the prevalence of BAM in adults with Crohn's disease (CD) independent of ileal resection is not well characterized. We herein aim to identify the prevalence of BAM and determine its associations with diarrhea in adults with mucosal healing of CD on ileocolonoscopy.

Methods: We analyzed a prospective cohort of adults with CD enrolled at a single institution biobank who underwent ileocolonoscopies from Jun 2014 to Mar 2021. Exclusion criteria were isolated upper GI CD (n=1) or prior bowel resection (n=9). Diarrhea was defined as an average of >3 liquid or very soft stools per day (SF>3) on the 2-item patient-reported outcome (PRO-2) measure over a 7-day period starting 48 hours before beginning bowel preparation. Endoscopic remission was defined as ≤2 on the Simple Endoscopic Score for Crohn's Disease (SES-CD). Histologic remission was defined as Geboes score < 2B.0 on biopsies from pre-determined ileocolonic segments (terminal ileum; ascending, descending, and rectosigmoid colon). Serum concentrations of 7α-hydroxy-4-cholesten-3-one (7C4), a precursor bile acid synthesis, were measured by liquid chromatography and mass spectrometry (Prometheus Laboratories) with BAM defined as a concentration ≥48.3 ng/mL (PMID: 30448597). We performed univariable analysis (χ^2) and multivariable logistic regression to identify factors associated with diarrhea.

Results: In 181 patients with CD in endoscopic remission, 29% (53/181) had diarrhea, and 29% (40/136) of those with 7C4 testing had BAM. Increased risk for diarrhea existed among those with BAM (OR 4.6, 95% CI 2.1-10.3, p< 0.01) and females (OR 2.2, 95% CI 1.1-4.3, p=0.02) (Table). On multivariate analysis, only BAM was a predictor of diarrhea (aOR 4.0, 95% CI 1.5-10.8, p< 0.01), but gender, ethnicity, and CD phenotype/location/duration were not predictors (Figure). Of the 57 patients with CD in endoscopic and histologic (endo-histologic) remission, BAM remains a risk factor for diarrhea (26%, 15/57; OR 35.8, 95% CI 6.9-184.2, p< 0.01).

Conclusion: Bile acid malabsorption occurred in 29% and 26% of our cohort of adults with Crohn's disease in endoscopic remission and endo-histologic remission, respectively, and conferred a 4-fold increased risk for diarrhea despite mucosal healing in Crohn's disease.



[0814] **Figure 1.** Multivariable analysis of factor associated with diarrhea in adults with Crohn's disease in endoscopic remission Key: aOR; adjusted odds ratio. CD, Crohn's disease. Multivariable analysis of factor associated with diarrhea in adults with Crohn's disease in endoscopic remission. Independent variables gender, ethnicity; CD phenotype, location, duration; and bile acid malabsorption. Dependent variable: diarrhea (SF >3) or diarrhea (stool frequency, SF >3).

Table 1. Crohn's disease in Endoscopic remission (N=181)

Characteristics n (%)	Diarrhea (n=53)	No Diarrhea (n=128)	p-value	OR (95% CI)	p-value
Gender			**0.02**		
Female	36 (68%)	63 (49%)		2.2 (1.1-4.3)	**0.02**
Male	17 (32%)	65 (51%)		Ref	/
Ethnicity			0.38		
Caucasian					
Non-Caucasian	39 (74%)	101 (80%)		0.7 (0.3-1.5)	0.38
Missing n=1	14 (26%)	26 (20%)		Ref	/
CD phenotype			0.08		
Inflammatory					
Stricturing	18 (43%)	65 (63%)		Ref	/
Fistulizing	12 (29%)	20 (19%)		2.2 (0.9-5.3)	0.0871
Missing n=36	12 (29%)	18 (17%)		2.4 (1.0-5.9)	0.0551
CD disease location			0.14		
Ileal	22 (47%)	36 (32%)		1.5 (0.6-3.4)	0.38
Colonic	14 (28%)	31 (28%)		Ref	/
Ileocolonic	12 (26%)	45 (40%)		0.6 (0.3-1.6)	0.33
Missing n=22					
CD duration			0.23		
< 5 years					
5-15 years	11 (21%)	31 (25%)		Ref	/
>15 years	16 (31%)	51 (41%)		0.9 (0.4-2.1)	0.79
Missing n=4	25 (48%)	43 (63%)		1.6 (0.7-3.8)	0.25
Bile acid malabsorption			**< 0.01**		**< 0.01**
Yes					
No	22 (52%)	18 (19%)		4.6 (2.1-10.3)	
Missing n=45	20 (48%)	76 (81%)		Ref	

Key: CD, Crohn's disease; OR, odds ratio.

S815

Patients With Neuro-Developmental Disorders Are Associated With a Higher Risk of Inflammatory Bowel Disease: A Nationwide Population-Based Study

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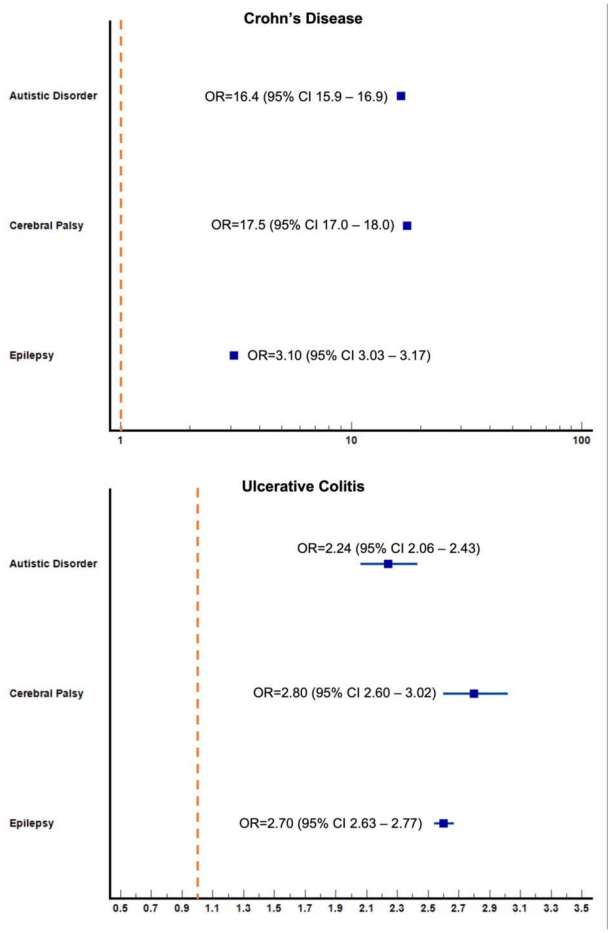
Introduction: Previous studies have suggested that patients with neurodevelopmental disorders (NDD) were much more likely to report gastrointestinal symptoms such as abdominal pain or diarrhea. Gut microbiota is influential in brain development and behaviors and inflammatory bowel disease (IBD) is known to induce gut inflammation and microbiota dysbiosis. The objective of this study was to investigate the prevalence of inflammatory bowel disease (IBD) among patients with neuro-developmental disorders in a large national database.
Methods: We used the IBM Explorys clinical database which includes over 74 million de-identified unique patients across 300 hospitals in the United States. Our patient cohort was identified using SNOMED and ICD codes. We identified all patients (age > 18) with neuro-developmental disorders who were diagnosed with either autism spectrum disorder (ASD), cerebral palsy (CP), or epilepsy. We investigated the prevalence of Crohn's disease (CD) and ulcerative colitis (UC) in patients with NDD compared to patients with no NDD. Odds ratios with 95% confidence intervals were calculated to evaluate the risk of IBD.
Results: We identified a total of 889,540 patients with NDD. Among them, 87,720 (9.86%) had ASD, 83,570 (9.39%) had CP and 758,370 (85.3%) had epilepsy. In this cohort, 12,730 (1.43%) and 6,700 (0.75%) developed either CD or UC, respectively compared to 0.57% in individuals without NDD, p< 0.0001 to all. There was a higher tendency for patients with both NDD and IBD to be female [OR: 1.06; 95% CI: 1.04 – 1.09] and Caucasian [OR: 1.45; 95% CI: 1.40 – 1.49]. Overall, patients with NDD had a significantly higher risk of CD [OR: 4.25; 95% CI: 4.17 – 4.33] and UC [OR: 2.60; 95% CI: 2.54 – 2.67] compared to patients without NDD (Figure). Patients with ASD [OR: 16.4; 95% CI: 15.9 – 16.9] and CP [OR: 17.5; 95% CI: 17.0 – 18.0] were associated with the highest risk of CD.
Conclusion: In this large retrospective study, we found that patients with neurodevelopmental disorders had a significantly higher risk of IBD than the general population. Interestingly, CP and ASD patients were associated with a disproportionally high risk of CD. These findings may suggest a bi-directional relationship between neurological disorders and IBD.



[0815] **Figure 1.** Univariate analysis of IBD risk in neuro-developmental disorders. OR; odds ratio, CI; confidence interval

Table 1. Demographics of patients with neuro-developmental disorders and IBD

Variable	Patients with Neuro-developmental Disorders		Patients without Neuro-Developmental Disorders
	With IBD	Without IBD	
Age 18 - 64	10,990 (62.1%)	605,260 (69.4%)	47,344,760 (68.1%)
Age >65	6,650 (37.6%)	263,700 (30.2%)	21,023,950 (30.2%)
Female	10,800 (61.1%)	440,110 (50.5%)	38,048,260 (54.7%)
Caucasian	14,210 (80.3%)	584,130 (67.0%)	37,279,600 (53.6%)
Brain Neoplasm	2,860 (16.2%)	41,380 (4.7%)	305,330 (0.4%)
History of Meningitis	360 (2.0%)	10,970 (1.3%)	92,890 (0.1%)
History of Encephalitis	340 (1.9%)	10,120 (1.2%)	49,100 (0.1%)
History of CVA	5,260 (29.7%)	26,330 (3.0%)	205,620 (0.3%)

CVA; cerebrovascular accident.

S816

Safety and Efficacy of Endoscopic Dilation of Small Bowel Crohn's Disease Strictures via Ileostomy

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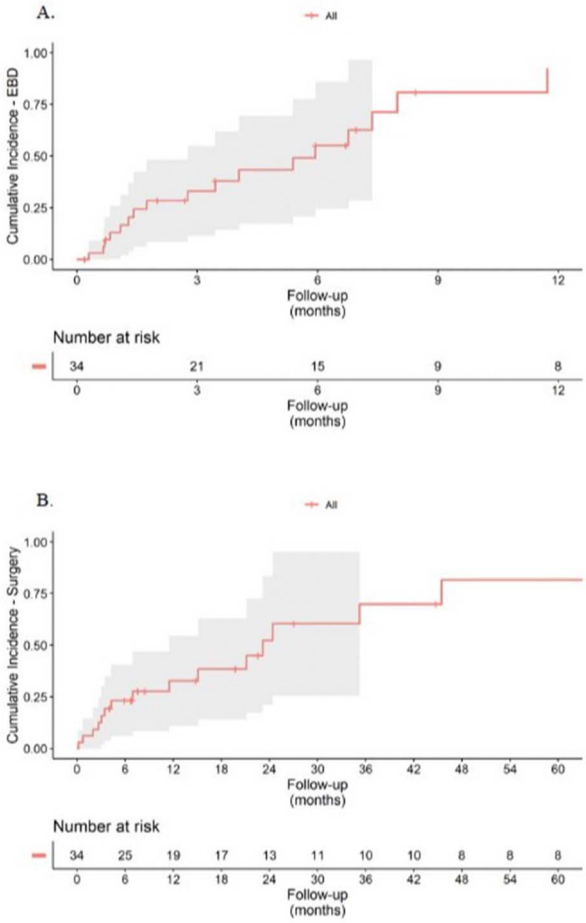
Introduction: Crohn's disease (CD) manifests as a variety of phenotypes of which fibrostenotic strictures signify an increased risk of progression to obstructive complications. Medical management of stricturing CD is limited and often requires surgical interventions. Endoscopic balloon dilation (EBD) has emerged as an alternative to surgery in CD strictures. Data on EBD in CD strictures of patients with ileostomy is limited.
Methods: All CD patients who had undergone EBD for strictures via ileoscopies through a small bowel stoma performed at a tertiary medical center from February 2010 to December 2021 were included. Strictures were defined as the inability to pass an upper endoscope. Patients were followed until the date of stricture-related surgery or at least one month post EBD. Data on technical (ability to pass the scope after dilation) and clinical (symptom improvement) success, long-term efficacy, and complications were investigated. (Figure)
Results: In total, 34 CD patients (59% female) with end ileostomies (88.2%) or diverting loop ileostomies (11.8%) were identified with a median follow-up of 18.3 months [Interquartile Range (IQR) 6.8, 45.3]. Median age at index EBD was 45 years [IQR 31.6, 56.7] The median maximal balloon dilation diameter at index EBD was 16.7 mm [IQR13.1, 18.3]. Technical success was achieved in 100% of the EBDs, with 91% of patients endorsing clinical success (improvement in symptoms). Obstructive symptoms recurred in 32% of patients. Repeat EBD was performed in 52.9% with a median time to dilation of 7.4 months [95% CI: 4, 17.8]. Furthermore, 41.2% of patients underwent one additional EBD and 14.7% had two or more additional EBDs. During follow-up, 47.1% underwent stricture-related surgery with a median time to resection of 35.2 months [95% C1: 21.1, 116.6]. There were no short-term complications within a week however long-term complications included an abscess in one patient and a fistula in another patient. (Table)

Conclusion: EBD of small bowel CD-associated strictures through an ileostomy has a high rate of technical and clinical success with robust long-term efficacy. Serial dilation of the same stricture is feasible and the complication rate is low. EBD may allow clinicians to effectively postpone surgery for CD strictures in patients with an ileostomy.



[0816] **Figure 1.** (A) Kaplan-Meier cumulative incidence hazard curves for time to repeat EBD. (B) Kaplan-Meier cumulative incidence hazard curves for time to stricture-related surgery.

Table 1. Summary of descriptive statistics by status of repeat EBD

Variable	Level	All (n=34)	No (n=16)	Yes (n=18)	P-value	N
Age		45.0 [31.6;59.0]	51.8 [31.9;56.7]	41.3 [32.1;60.2]	0.918	34
Sex	Female	20 (58.8%)	12 (75.0%)	8 (44.4%)	0.145	34
	Male	14 (41.2%)	4 (25.0%)	10 (55.6%)		
BMI at time of EBD		22.5 [20.7;26.3]	23.0 [20.8;26.4]	22.2 [20.7;26.3]	0.986	34
Time since CD diagnosis (years)		20.1 [15.1;32.1]	20.3 [16.1;34.3]	19.4 [14.4;31.4]	0.666	34
Smoking History	Non-Smoker	25 (73.5%)	12 (75.0%)	13 (72.2%)	0.737	34
	Smoker	3 (8.82%)	2 (12.5%)	1 (5.56%)		
	Former Smoker	6 (17.6%)	2 (12.5%)	4 (22.2%)		
Disease Location	Stomach	2 (5.88%)	1 (6.25%)	1 (5.56%)	>0.999	34
	Duodenum	6 (17.6%)	5 (31.2%)	1 (5.56%)	0.078	34
	Jejunum/proximal ileum	15 (44.1%)	8 (50.0%)	7 (38.9%)	0.760	34
	Ileum	34 (100%)	16 (100%)	18 (100%)	N/A	34
	Ileocecal	34 (100%)	16 (100%)	18 (100%)	N/A	34
	Colon	29 (85.3%)	13 (81.2%)	16 (88.9%)	0.648	34
	Rectum	26 (76.5%)	11 (68.8%)	15 (83.3%)	0.429	34
	Perianal	13 (38.2%)	3 (18.8%)	10 (55.6%)	0.064	34
Extraintestinal Manifestations (EIM)	Yes	31 (93.9%)	13 (86.7%)	18 (100%)	0.199	34
Type of EIM	Eyes)	1 (2.94%)	0 (0.00%)	1 (5.56%)	>0.999	34
	Oral Ulcers)	5 (14.7%)	2 (12.5%)	3 (16.7%)	>0.999	34
	Joints	5 (14.7%)	3 (18.8%)	2 (11.1%)	0.648	34
	Skin	5 (14.7%)	1 (6.25%)	4 (22.2%)	0.340	34
	Anemia	20 (58.8%)	7 (43.8%)	13 (72.2%)	0.182	34
	PSC	1 (2.94%)	0 (0.00%)	1 (5.56%)	>0.999	34
	Malnutrition	25 (73.5%)	10 (62.5%)	15 (83.3%)	0.250	34
	Hypoalbuminemia	25 (73.5%)	10 (62.5%)	15 (83.3%)	0.250	34
	Other	1 (2.94%)	1 (6.25%)	0 (0.00%)	0.471	34

Table 1. (*continued*)

Variable	Level	All (n=34)	No (n=16)	Yes (n=18)	P-value	N
Montreal Classification	B2 B2p B3 B3p	4 (11.8%) 7 (20.6%) 5 (14.7%) 18 (52.9%)	3 (18.8%) 5 (31.2%) 1 (6.25%) 7 (43.8%)	1 (5.56%) 2 (11.1%) 4 (22.2%) 11 (61.1%)	0.219	34 34
Number of prior surgeries		6.00 [4.25;8.00]	5.50 [3.50;7.25]	7.00 [5.25;9.50]	0.150	
Ostomy type at time of EBD	End Loop Ileostomy Diverting Loop Ileostomy	30 (88.2%) 4 (11.8%)	15 (93.8%) 1 (6.25%)	15 (83.3%) 3 (16.7%)	0.604	34
Time from date of ostomy creation to index EBD (years)		4.13 [2.07;7.02]	3.20 [1.91;7.80]	4.33 [2.95;6.90]	0.629	34
Stricture balloon size (cm)		1.80 [1.20;2.00]	1.80 [1.35;2.00]	1.50 [1.20;1.80]	0.315	19
Stricture maximum diameter of dilation during EBD (cm)		1.67 [1.31;1.83]	1.80 [1.35;2.00]	1.50 [1.20;1.80]	0.315	28
Total Number of strictures	1 2	25 (73.5%) 9 (26.5%)	14 (87.5%) 2 (12.5%)	11 (61.1%) 7 (38.9%)	0.125	34
Hemoglobin (g/dL)		12.5 (2.26)	12.4 (2.04)	12.6 (2.49)	0.828	23
Albumin (g/dL)		3.71 (0.65)	3.58 (0.38)	3.84 (0.82)	0.365	21
CTE or MRE within 6 months prior to Index EBD		12 (35.3%)	11 (68.8%)	11 (61.1%)	0.916	34

S817

The Effect of Guselkumab Induction Therapy on Inflammatory Biomarkers in Patients With Moderately to Severely Active Ulcerative Colitis: QUASAR Phase 2b Induction Results Through Week 12

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Introduction: C-reactive protein (CRP) and fecal calprotectin (FeCal) are non-invasive inflammatory biomarkers used to assess disease activity in patients with inflammatory bowel disease (IBD). Here we report inflammatory biomarker results through Week 12 for QUASAR (NCT04033445) Phase 2b Induction. QUASAR is a randomized, double-blind, placebo-controlled study of guselkumab (GUS), an interleukin-23 p19 subunit antagonist, in patients with moderately to severely active UC who had an inadequate response or intolerance to conventional (ie, thiopurines or corticosteroids) or advanced therapy (ie, tumor necrosis factor alpha antagonists, vedolizumab, or tofacitinib).
Methods: Patients with moderately to severely active UC (defined as a modified Mayo score of 5 to 9, inclusive with a Mayo rectal bleeding subscore ≥ 1 and a Mayo endoscopy subscore ≥ 2 obtained at baseline [BL]) were randomized 1:1:1 to receive IV GUS 200 mg, 400 mg, or placebo at Weeks 0, 4, and 8. CRP and FeCal were assessed at BL and through Week 12.
Results: Three hundred thirteen patients were included in the analysis; approximately 50% had a history of inadequate response/intolerance to advanced therapies. Median BL CRP and FeCal concentrations were similar across treatment groups. Greater median reductions in CRP and FeCal were observed at the earliest timepoint assessed (Week 4) with GUS and continued to Week 12 compared with placebo (Table). Median changes from BL to Week 12 in CRP were -1.86 mg/L for the combined GUS group compared with 0.06 mg/L for placebo (nominal p< 0.001). Median changes from BL to Week 12 in FeCal were -684.00 mg/kg and 0.00 mg/kg for the combined GUS group and placebo, respectively (nominal p< 0.001). At Week 12, higher proportions of patients treated with GUS compared with placebo had normalized CRP ≤3 mg/L (44.2% vs 18.8%, nominal p< 0.001), and normalized FeCal ≤250 mg/kg (33.0% vs 9.9%, nominal p< 0.001), respectively, among patients with abnormal CRP or FeCal at BL.
Conclusion: Patients with moderately to severely active UC who received GUS IV induction treatment had greater reductions in CRP and FeCal concentrations through Week 12 compared with placebo with no dose dependent effect for GUS 200 mg and 400 mg. Reductions in CRP and FeCal were observed as early as Week 4 with GUS and continued to Week 12. Higher proportions of patients had normalized CRP and normalized FeCal levels at Week 12 with GUS compared with placebo.

Table 1. **Change from baseline in CRP and FeCal concentrations through Week 12**

	Placebo IV(N=105)	Guselkumab 200 mg IV (N=101)	Guselkumab 400 mg IV(N=107)	Guselkumab Combined (N=208)
CRP (mg/L)				
Baseline, N Median (IQR)	105 4.89 (1.35; 10.80)	99 4.31 (1.61; 17.80)	104 4.38 (1.88; 8.81)	203 4.37 (1.74; 11.90)
Change from baseline at Week 4, N Median (IQR)	104 0.00 (-1.32, 1.37)	98 -2.18 (-8.60;-0.28)**	101 -1.15 (-5.45; -0.06)**	199 -1.45 (-6.69; -0.17)**
Change from baseline at Week 8, N Median (IQR)	103 0.00 (-2.49; 1.74)	94 -2.60 (-9.30; -0.39)**	102 -1.55 (-4.80; -0.18)**	196 -2.10 (-7.49; -0.23)**
Change from baseline at Week 12, N Median (IQR)	102 0.06 (-2.23; 2.94)	97 -2.31 (-8.20; -0.33)**	100 -1.06 (-4.76; 0.07)**	197 -1.86 (-6.28; -0.06)**
FeCal (mg/kg)				
Baseline, N Median (IQR)	91 1457.00 (749.00; 3054.00)	95 1667.00(771.00; 2859.00)	101 1578.00(811.00; 2860.00)	196 1619.50 (791.00; 2859.50)
Change from baseline at Week 4, N Median (IQR)	89 -116.00 (-830.00; 812.00)	89 -358.00 (-1641.00; 226.00)	95 -391.00 (-1301.00; 167.00)*	184 -378.00 (-1503.00;207.00)*
Change from baseline at Week 12, N Median (IQR)	77 0.00 (-855.00; 1089.00)	82 -745.00(-1946.00; 0.00)**	88 -558.50(-1426.00; -12.50)**	170 -684.00 (-1682.00, -10.00)**

Patients who had a prohibited change in UC medication, an ostomy or colectomy, or discontinued study agent due to lack of efficacy or an AE of worsening of UC prior to the designated timepoint had their baseline value carried forward from the time of the event onward. Data after a discontinuation of study agent due to COVID-19 related reasons (excluding COVID 19 infection) were considered to be missing.
*Nominal P< 0.05
**Nominal P< 0.001

S818

An Insight into the Patient's Perspective of Ulcerative Colitis Flares via Analysis of Online Public Forum Posts: Key Triggers and Symptoms of Flares

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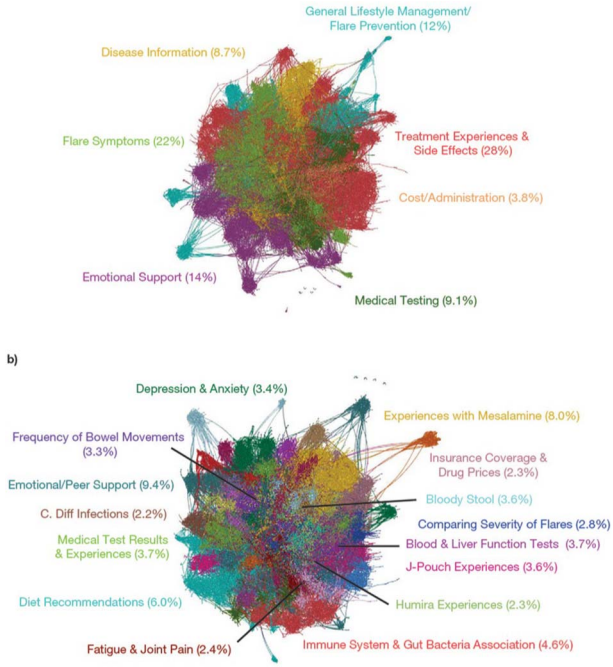
Introduction: Prediction of flares in UC remains a challenge, with limited analyses on patient (pt)-reported themes associated with onset. The aim of this analysis was to identify the most common pt-reported triggers and symptoms of UC flares.
Methods: We reviewed online posts written by pts with UC on 8 public forums in 6 countries between January 1, 2019 and February 14, 2021. Flare-related posts (identified by keywords; Table), including pre- and post-flare posts from the same pts, were captured using Netbase Quid™ artificial intelligence text analytics and natural language processing software. Once identified, all flare-related posts were analyzed and mapped semantically to uncover the most prevalent conversational topics and themes regarding flares to outline the unmet needs and challenges discussed and to examine self-reported triggers of flares.
Results: Of > 27,000 pt posts, 12,900 were identified as flare-related. The most common themes identified were treatment experiences, side-effects (28%), and flare symptoms (22%; Figure a). Of the top topics discussed, the most common was emotional / peer support (9.4% of posts), followed by posts on the individual experiences and recommendations of mesalamine (and other oral / rectal suppositories; 8.0% of posts), the most common treatment option discussed, and dietary recommendations (6.0% of posts; Figure b). Pain was a high-impact topic (fatigue and joint pain, 2.4% of posts; Figure b). Stress and anxiety were the most reported triggers of flares (38% of posts), followed by diet (28% of posts; Table), with discussions suggesting pts with UC had difficulty managing external stressors. Depression, anxiety, and fatigue were frequently identified as both triggers for and symptoms of flares. Initial symptoms of flares (e.g., blood in stool; diarrhea and loose stool; stool frequency) were often not distinguished from full flares. Blood in the stool was the most discussed flare indicator (58%; Table).
Conclusion: The results of this analysis of pt posts suggest that some frequently discussed triggers and / or symptoms of UC flares, such as depression, anxiety, pain, and sleep disturbances, are not always captured using traditional clinical disease activity measures.[1,2] Physicians should consider additional pt-reported outcomes, including emotional and psychological aspects, during the assessment of pts.



[0818] **Figure 1.** a) Top themes and b) top topics in UC patient forum flare-related posts. Flare-related posts, including those from the same author pre- and post-flare, were identified from online posts written by patients with UC on 8 public forums (Afa Crohn RCH, Carenity, Crohn Club Forum, Crohn's Forum, Deutsche Morbus Crohn/Colitis ulcerosa Vereinigung; Educainflamatoria, HealingWell, Patient) in 6 countries (France, Germany, Italy, Spain, United Kingdom, and United States) between January 1, 2019 and February 14, 2021. Flare-related posts were identified as those containing relevant keywords, including flare, remission, inflammation, cramps, attack, relapse, symptoms, and bloody stool. Flare-related post data were color-coded by a) themes and b) topics; each node represents a post, and connections represent similar language used across the posts. Centrally located nodes represent core concepts, and peripheral nodes represent niche concepts. UC, ulcerative colitis

Table 1.

Most discussed flare triggers and initial flare symptoms in patients with UC

Ranking	Flare triggers (percentage of posts), (N=1,161)	Initial flare symptoms (percentage of posts), (N=645)
1	Stress and anxiety (38%)	Blood in stool / passing blood (58%)
2	Diet (28%)	Diarrhea and loose stool (19%)
3	Smoking cessation (9%)	Stool frequency (19%)
4	Antibiotics (9%)	Mucus in stool / passing mucus (17%)
5	Bacterial or viral infection (7%)[a]	Pain and cramping (14%)
6	NSAID usage (6%)	Fatigue (7%)

Flare-related posts, including those from the same author pre- and post-flare, were identified from online posts written by patients with UC on 8 public forums (Afa Crohn RCH, Carenity, Crohn Club Forum, Crohn's Forum, Deutsche Morbus Crohn / Colitis ulcerosa Vereinigung, Educainflamatoria, HealingWell, and Patient) in 6 countries (France, Germany, Italy, Spain, United Kingdom, United States) between January 1, 2019 and February 14, 2021. Flare-related posts were identified as those containing relevant keywords, including flare, remission, inflammation, cramps, attack, relapse, symptoms, and bloody stool.
[a]Patients who identified bacterial or viral infections as a flare trigger had uniquely low confidence and were unsure about infections being the cause of their triggers.
NSAID, nonsteroidal anti-inflammatory drug; UC, ulcerative colitis.

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S819

Non-Biologic Medication Use Pre- and Post-Ustekinumab Initiation Among Patients With Ulcerative Colitis

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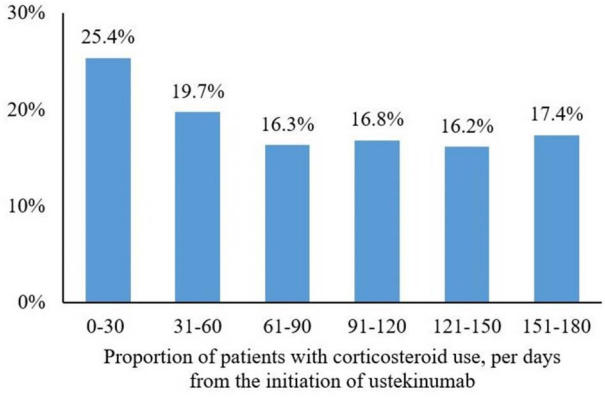
Introduction: Among patients with ulcerative colitis (UC), treatment with immunomodulators, 5-ASA (5-aminosalicylic acid), and corticosteroids while receiving biologic agents is common. However, real-world information on non-biologic medication use among UC patients initiated on ustekinumab is limited. This study compared non-biologic medication use pre- and post-ustekinumab initiation among UC patients.
Methods: Adults with UC initiated on ustekinumab (index date) between 10/18/2019 (FDA approval of ustekinumab for UC) and 10/31/2020 were selected from the de-identified health insurance claims Symphony Health Solutions' Patient Transactional Datasets. Patients were excluded if they had a claim for Crohn's disease anytime or for other autoimmune diseases pre-index. Patients were required to have: ≥1 claim for UC in the 12 months pre-index period (baseline), ≥2 ustekinumab claims within 90 days of the index date, and ≥6 months of follow-up. Non-biologic agent use in the 6 months period before and after the initiation of ustekinumab was compared with a logistic model estimated by generalized estimating equation. Results were reported as odds ratio with 95% confidence interval and p-values.
Results: A total of 760 patients with UC were initiated on ustekinumab and selected for the study (age 44.6 years old; 48.9% female; baseline biologic use 52.1% [potentially underestimated given the database open nature]; Quan-Charlson comorbidity index 0.62). The likelihood of immunomodulator and 5-ASA use decreased by 22% and 46%, after ustekinumab initiation (all P< 0.05). Similarly, patients were 52% less likely to use any corticosteroids and 34% less likely to use corticosteroids for ≥60 days (all P< 0.05). Further, there was no significant changes observed for the use of opioids (18.9% vs. 17.4%) or the use of anti-diarrheals (5.9% vs. 6.1%), and patients were 29% less likely to use GI antispasmodics after ustekinumab initiation (P< 0.05; Table). In a descriptive analysis, corticosteroids use numerically decreased at each month post-ustekinumab from 25.4% during the first 30 days following the index date compared to 17.4% within 150-180 days post-ustekinumab (Figure).
Conclusion: In this real-world study of patients with UC, initiating ustekinumab was associated with a significant decrease in the use of immunomodulators, 5-ASA, and corticosteroids. Longer-term data are necessary to better understand non-biologic medication use after biologic initiation and inform treatment choice for patients with UC.



[0819] **Figure 1.** Corticosteroid use during the 6 months post-ustekinumab initiation (N=760).

Table 1. Non-biologic medication use in the 6-month period before vs after the initiation of ustekinumab

	Pre-ustekinumab	Post-ustekinumab	Odds ratio[1] (95% CI), p-value
	N = 760		
Use of immunomodulators	120 (15.8)	97 (12.8)	0.78 (0.64, 0.95), 0.014*
Use of 5-ASA	312 (41.1)	208 (27.4)	0.54 (0.47, 0.62), < 0.001*
Use of corticosteroids	481 (63.3)	346 (45.5)	0.48 (0.41, 0.57), < 0.001*
Cumulative use[2] ≥60 days	243 (32.0)	180 (23.7)	0.66 (0.55, 0.79), < 0.001*
Cumulative use[2] ≥90 days	151 (19.9)	114 (15.0)	0.71 (0.58, 0.87), 0.001*
≥1 episode[3] ≥ 60 days	201 (26.4)	156 (20.5)	0.72 (0.59, 0.87), < 0.001*
≥1 episode[3] ≥ 90 days	118 (15.5)	89 (11.7)	0.72 (0.56, 0.93), 0.013*
Use of opioids	144 (18.9)	132 (17.4)	0.90 (0.74, 1.10), 0.296
Use of antidiarrheals	45 (5.9)	46 (6.1)	1.02 (0.76, 1.38), 0.879
Use of GI antispasmodics	86 (11.3)	63 (8.3)	0.71 (0.54, 0.93), 0.013*

Abbreviations: CI: Confidence interval; GI: Gastrointestinal; 5-ASA: 5-aminosalicylic acid Notes: (1) Odds ratio obtained from a logistic model estimated with generalized estimating equation; (2) Non-overlapping days of supply included; (3) A therapy exposure gap of 14 days of supply was used to define continuous use

S820

Health Disparities, Social Determinants of Health, and Emotional Impacts in Patients With Ulcerative Colitis: Results From a Global Ulcerative Colitis Patient Survey

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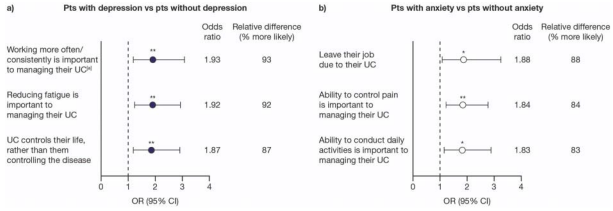
Introduction: The UC Narrative global survey assessed various aspects of living with UC, including gaps in patient (pt) care and communication between pts and physicians. This analysis aimed to identify health disparities, social determinants of health, and emotional impacts related to UC disease management, healthcare experience, and overall quality of life.

Methods: The UC Narrative survey was conducted by The Harris Poll (Aug 2017–Feb 2018). This analysis included 1,000 pts diagnosed with UC (confirmed by endoscopy) from the United States, Canada, Japan, France, and Finland (aged ≥ 18 years, no prior colectomy, had been to a gastroenterologist/internist's office within the past year, and had ever taken UC prescription medication other than only aminosalicylates). Survey items were stratified by categories pertaining to pt demographics, access disparities, gaps in optimal care, mental health impacts, and the pt perspective. Data were analyzed and presented using logistic regression with odds ratios (ORs) and relative difference between groups.
Results: Disparities related to sex (Table) and psychological comorbidities (Figure) impacted the pts' healthcare experience and/or factors considered important for UC disease management. Low-income pts vs high-income pts were 70% (OR = 0.30) and 49% (OR = 0.51) less likely to have participated in a peer mentoring or a UC education program, respectively, and 48% less likely (OR = 0.52) to have reached out to pt associations or organizations. Pts with lower vs higher educational levels were 41% less likely (OR = 0.59) to have reached out to pt associations or organizations. Compared with pts employed full time, pts who were not employed were 89% less likely (OR = 0.11) to have stopped treatment to start a family, 53% less likely (OR = 0.47) to be satisfied (at least somewhat) with their current medication, and 42% less likely (OR = 0.58) to say they were in "good/excellent" health. Pts aged ≤ 50 years vs pts aged > 50 years were 53% less likely (OR = 0.47) to agree that reducing the need for prescription medications was important to UC management and 47% less likely (OR = 0.53) to have visited an inflammatory bowel disease center or clinic. All results shown were significant ($p < 0.05$).
Conclusion: Substantial differences in pt-reported assessments of disease management and healthcare experience were identified, based on factors such as sex, psychological comorbidities, income, educational level, employment status, and age.



[0820] **Figure 1.** Most common factors impacted by psychological comorbidities. OR and relative differences (defined as OR minus 1) in pt response between pts with a) depression or b) anxiety were compared with pts without depression or anxiety, respectively. Pts with these psychological comorbidities were almost twice as likely to agree with the specified survey responses related to factors important to their quality of life and management of their UC. [a] Among pts who were employed. *p < 0.05; **p < 0.01. CI, confidence interval; OR, odds ratio; pt, patient; UC, ulcerative colitis.

Table 1. Disparities related to sex: findings in males vs females

Survey response	Odds ratio (95% CI)	Relative difference[a]
Say reducing fatigue is important to managing their UC	0.39 (0.29, 0.54)**	61% less likely
Say being able to manage the psychological impacts of the disease is important to managing their UC	0.47 (0.34, 0.66)**	53% less likely
Say avoiding toileting accidents or the need to prepare for toileting accidents is important to managing their UC	0.48 (0.35, 0.66)**	52% less likely
Say being able to control pain (e.g., abdominal, joint, etc.) is important to managing their UC	0.59 (0.43, 0.80)**	41% less likely
Say having less impact on familial or social relationships is important to managing their UC	0.69 (0.50, 0.96)*	31% less likely
Have answered 5 of the 7 knowledge of UC questions[b] correctly	0.55 (0.39, 0.77)**	45% less likely
Visited an office with an IBD center/clinic in the past 12 months	0.60 (0.42, 0.84)**	40% less likely
Were currently seeing their gastroenterologist[c]	0.66 (0.44, 0.98)*	34% less likely
Have been hospitalized in the past 12 months	1.74 (1.26, 2.43)**	74% more likely
Had two or more flares[d] in the past 12 months	1.73 (1.23, 2.42)**	73% more likely
Agree they feel comforTable discussing their health issues in their workplace (among employed patients)	1.56 (1.09, 2.22)*	56% more likely

[a]Defined as OR minus 1
[b]True or false questions relating to UC disease and treatment knowledge
[c]Question: Which healthcare professionals, if any, do you currently see to manage your UC? When thinking about managing your UC, please include all healthcare professionals involved in helping you live with and treat the symptoms of your UC, such as managing your medication, treating the inflammation of your colon, etc. Please select all that apply
[d]A period where the patient experienced a dramatic increase in symptoms different from what is typically experienced
*p < 0.05; **p < 0.01
IBD, inflammatory bowel disease; CI, confidence interval; OR, odds ratio; UC, ulcerative colitis

S821

Early Biologic Therapy Reduces Complications in Ulcerative Colitis

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Introduction: Ulcerative colitis (UC) is a heterogeneous and unpredicTable disease with the potential for disease worsening over time and should be regarded as a progressive disease. More recent evidence and clinical practice guidelines suggest that biologic therapy is a preferred initial therapy in treating moderate to severe UC. However, despite these guidelines, little research has been done to determine the optimal timing for the initiation of biologic therapy. Data on the impact of early intervention in UC are limited, and whether more intensive treatments prevent structural and functional complications is still debated. We hypothesize that early initiation of biologic therapy (specifically within 2 years of diagnosis) will lead to fewer UC-related complications and higher response rates.
Methods: We conducted a retrospective cohort study of UC patients treated within the Military Health System to assess the relationship of timing of initiation of biologic therapy with the control of ulcerative colitis. Data was collected from the military's universal electronic health record from January 1, 2013 to December 30, 2020 to measure the course of patients' disease as determined by clinical, biochemical, radiologic, and endoscopic/histologic findings, with an assessment of clinical outcomes and complications to include UC-related emergency room visits, steroid use, hospitalizations, and surgeries.
Results: 371 patients with UC were identified, of which 181 were started on biologic therapy within 2 years of diagnosis, while 190 were started on biologic therapy 2 or more years after diagnosis. Patients who initiated biologic therapy within 2 years of diagnosis had significantly fewer UC-related complications ($p < 0.0001$) (Image 1a). Extensive disease at diagnosis was also predictive of a decreased likelihood of a composite of UC-related complications (Image 1b). Patients with lower Mayo scores were also more likely to experience UC-related complications (Image 1c).
Conclusion: These findings demonstrate that earlier initiation of biologics (within 2 years of diagnosis) results in a lower probability of UC-related complications, including emergency room visits, steroid use, hospitalizations, and surgeries. This study also suggests that even patients with minimal disease and lower Mayo scores on diagnosis could benefit from early biologic therapy.

Figure 1a

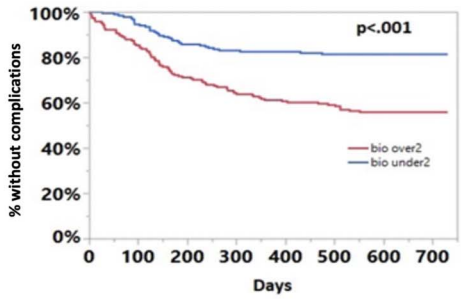


Figure 1b

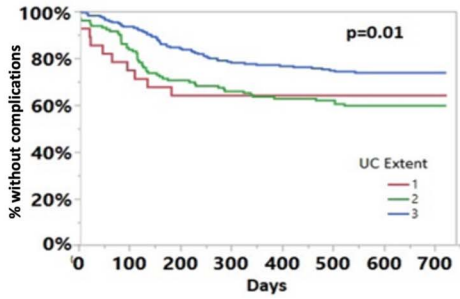
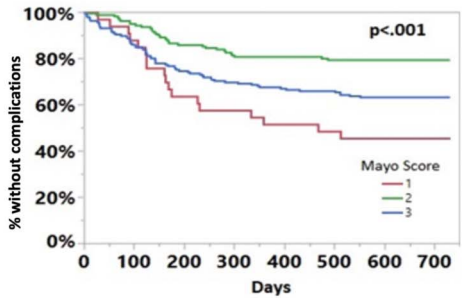


Figure 1c



[0821] **Figure 1.** Survival curves for complications with respect to timing of biologic start (1a), extent of UC disease at diagnosis (1b) and disease severity at diagnosis (1c).

S822

Fatigue Improvement Correlates With Reductions in Work Productivity Impairment and Related Indirect Cost in Patients With Crohn's Disease: Post Hoc Analysis of Phase 3 Rizankizumab Induction Trials

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Introduction: Patients with Crohn's disease (CD) frequently experience fatigue,[1] which may reduce quality of life and work productivity, contributing to patient and societal costs. This analysis used Phase 3 clinical trial data in CD patients to assess this relationship.
Methods: Pooled 12-week (wk) data was used from patients with moderate to severe CD who received risankizumab (600 or 1200mg IV) or placebo in ADVANCE and MOTIVATE. Patients completed Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) and Work Productivity and Activity Index (WPAI) questionnaires at Baseline (BL) and Wk 12. Risankizumab or placebo IV patients with no missing values were analyzed. Correlation between FACIT-F and WPAI was assessed by Pearson correlation. Mean change from BL to Wk 12 in WPAI assessed and stratified by quartiles of mean change from BL FACIT-F scores. Linear relationship between improvements from BL in FACIT-F and WPAI Overall Work Impairment (OWI) was assessed; results from the regression analyses were used to calculate cost savings based on corresponding WPAI scores and average hourly wages in the US and Europe. Annualized cost savings were defined in patients with clinically meaningful improvement (≥9unit increase) in FACIT-F and compared between patients who achieved or did not achieve a FACIT-F score > normative value (>40) at Wk 12.
Results: Mean age (std dev) of patients was 38.4 (13.3) years and 53.1%were male. Moderate correlation was observed between FACIT-F and all four domains of WPAI (Pearson coefficient range -0.55 to -0.30, $P< 0.0001$) at Wk 12. Greater improvements in WPAI scores from BL were observed in patients with greater mean change from BL scores in FACIT-F at Wk 12. A ≥9unit change from BL in FACIT-F at Wk 12 corresponded to a 12% reduction in OWI, resulting in 4.8 hours of improved work productivity per wk and an annualized cost savings per person of $7,749 in US and €7,117 in Europe. Patients with normative FACIT-F score of >40 at Wk 12 had a corresponding reduction in OWI of 29%, resulting in 12 hours less work impairment per wk and an annualized cost savings per person of $18,726 in US and €17,199 in Europe. (Table)
Conclusion: A significant correlation was observed between fatigue and work productivity in the induction trials of risankizumab. Early clinically meaningful improvements, and achieving fatigue normality, were associated with improvements in work productivity leading to substantial indirect cost savings.

Table 1. **Mean change in WPAI Stratified by Mean Change in FACIT-F Scores from Baseline to Week 12**

	FACIT-F < 2		2≤ FACIT-F < 9		9≤ FACIT-F < 17		FACIT-F ≥17		*P*-value
Work time missed	146	7.5 ± 32.5	133	-0.7 ± 25.6	162	-3.2 ± 30.1	185	-18.4 ± 36.7	< 0.0001
Overall work impairment	146	2.5 ± 27.3	133	-11.0 ± 26.3	162	-20.8 ± 29.2	185	-37.5 ± 31.3	< 0.0001

Table 1. (*continued*)

	FACIT-F < 2		2≤ FACIT-F < 9		9≤ FACIT-F < 17		FACIT-F ≥17		*P*-value
Impairment while working	130	-1.4 ± 21.9	121	-14.1 ± 22.6	147	-23.3 ± 23.5	160	-35.7 ± 26.1	< 0.0001
Activity impairment	303	-3.0 ± 23.0	310	-13.3 ± 22.5	300	-23.7 ± 23.7	341	-41.9 ± 26.7	< 0.0001

Data are n and mean change ± standard deviation. *P*-value derived from analysis of covariance (ANOVA).

S823

The Impact of Treatment Switch Among Prevalent Patients With Crohn's Disease Treated With a First-Line Biologic: A U.S. Retrospective Claims Database Study

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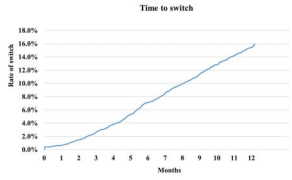
Introduction: Treatment switching often occurs with biologic use among patients with Crohn's disease (CD) and has been associated with worsened clinical symptoms and functional impairment. However, little is known about its impact on healthcare resource utilization (HRU) and costs. This study assessed the economic burden associated with treatment switching among adults with CD in the United States (US).
Methods: Data from the IBM® MarketScan® Commercial Subset (10/01/2015-03/31/2020) were used to identify adult patients newly diagnosed with CD (at least 2 CD diagnoses at least 30 days apart) and that were treated with a first line biologic (prescription fill/injection) on or after their CD diagnosis. The index date was defined as the date of the first line biologic. Patients were classified into the switchers or non-switchers cohort based on whether or not they switched to another biologic or 5-aminosalicylic acid or immunomodulator during the 12-month study period after the index date. Mean time to treatment switch was estimated using Kaplan-Meier analyses. All-cause HRU and healthcare costs (2020 USD) during the study period were described and compared (unadjusted) overall and for the 2 cohorts.
Results: Among 4,006 patients included in the study, 640 were switchers and 3,366 were non-switchers. Overall, mean age was 39.5 years and 50.9% were female. Rates of treatment switch were 7.1% at 6 months and 16.0% at 12 months (Figure). Additionally, rates of prolonged corticosteroid use (at least 90 days) was higher in switchers compared to non-switchers (31.6% vs 8.2%; p< 0.01). Switchers also had higher rates of inpatient admissions (25.9% vs 12.6%; p< 0.01), emergency department visits (41.6% vs 35.4%; p< 0.01), and number of outpatient visits (22.8 vs 17.0; p< 0.01) compared to non-switchers (Table). Similarly to HRU, total all-cause healthcare costs were higher among switchers than non-switchers ($95,689 vs $81,027; p< 0.01), which was mainly driven by higher medical costs ($24,135 vs $14,416; p< 0.01). Among age groups, switchers 30-39 years incurred the highest total cost ($100,676 vs 78,265, p< 0.01).
Conclusion: In this real-world study, patients with CD who switched biologic treatments, which is a marker of inadequate treatment, incurred significantly higher HRU and healthcare costs. These findings suggest a potential unmet need with current treatment options and highlight the impact of switching biologics on the economic burden of patients with CD.



	1 month	3 months	6 months	9 months	12 months
Patients at risk, N					
Treatment switch	3,980	3,901	3,722	3,550	3,366
Cumulative number of events, N					
Treatment switch	26	105	284	456	640
Cumulative rate (95% CIs)					
Treatment switch	0.6 (0.4; 1.0)	2.6 (2.2; 3.2)	7.1 (6.3; 7.9)	11.4 (10.4; 12.4)	16.0 (14.9; 17.1)

[0823] **Figure 1.** Kaplan-Meier analysis for time to switch CI: confidence interval

Table 1. **All-cause HRU and healthcare costs incurred during the study period**

Number of patients, N	Switchers (N=640)	Non-switchers (N=3,366)
All-cause HRU, N (%)		
Inpatient admission	166 (25.9%)	423 (12.6%)
Inpatient days, mean ± SD [median]	2.5 ± 6.4 [0.0]	1.1 ± 4.6 [0.0]
Emergency department visits	266 (41.6%)	1,192 (35.4%)
Days with outpatient visits	639 (99.8%)	3,331 (99.0%)
Number of days with outpatient visits, mean ± SD [median]	22.8 ± 17.0 [19.0]	17.0 ± 16.3 [13.0]
Healthcare costs (2020 USD), mean ± SD [median]		
Total (medical + pharmacy)	$95,689 ± $52,295 [$85,713]	$81,027 ± $50,743 [$72,464]
Medical	$24,135 ± $39,519 [$9,434]	$14,416 ± $33,575 [$4,847]
Inpatient	$11,491 ± $31,526 [$0]	$5,279 ± $22,861 [$0]
Outpatient	$10,906 ± $17,172 [$5,956]	$7,909 ± $17,732 [$3,687]
Emergency department	$1,738 ± $4,666 [$0]	$1,228 ± $5,330 [$0]
Pharmacy (including biologics)	$71,554 ± $35,174 [$66,355]	$66,611 ± $39,793 [$62,937]

HRU: healthcare resource utilization; SD: standard deviation; USD: United States dollar.

S824

Cost-Effectiveness of Precision-Guided Dosing in Adult Crohn's Disease Patients Initiating Infliximab Maintenance Therapy

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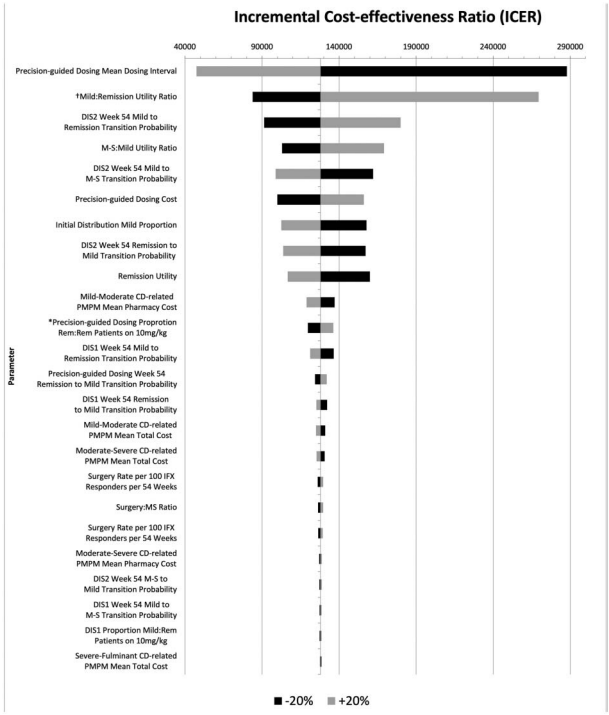
Introduction: Crohn's disease (CD) patients that lose response to biologics experience reduced quality of life (QoL) and costly hospitalizations. Precision-guided dosing provides clinicians with a comprehensive pharmacokinetic (PK) profile that allows for the next biologic dose to be personalized. We analyzed the cost-effectiveness of infliximab (IFX) Precision-guided dosing relative to two IFX dose intensification strategies (DIS).

Methods: We developed a hybrid (Markov and decision tree) model of CD patients who had a clinical response to IFX induction and entered IFX maintenance in "remission" or "mild symptoms" health states. The analysis took a US payer perspective, a time horizon of 2 years in the base case, and a cycle length of 4 weeks. There were 3 comparators for IFX dosing: Precision-guided dosing, dose intensification based on symptoms, inflammatory markers, and trough IFX concentration (DIS1), and IFX dose intensification based on symptoms alone (DIS2). Patients that failed IFX initiated ustekinumab (UST), followed by vedolizumab, and conventional therapy. Transition probabilities for IFX were estimated from real-world clinical PK data and interventional clinical trial (PMID: 34978325; 29317275) patient-level data. All other transition probabilities were derived from published randomized clinical trials and cost-effectiveness analyses. Utility values were sourced from previous health technology assessments. Direct costs included biologic acquisition and infusion, surgeries and procedures, conventional therapy, and lab testing. The primary outcomes were total discounted costs, total quality-adjusted life years (QALYs), and incremental cost-effectiveness ratios (ICERs). The robustness of results was assessed via one-way sensitivity and scenario analyses.

Results: Total costs and QALYs at 2 years are presented in Table. The ICERs of Precision-guided dosing relative to DIS1 and DIS2 were 171,810 and 127,990, respectively. One-way sensitivity analyses (Figure) demonstrated that the cost-effectiveness of Precision-guided dosing was most sensitive to the time between IFX doses. Precision-guided dosing had the lowest proportion of patients requiring a new biologic through 2 years (0.5% vs 2.4% and 27.7% for DIS1 and DIS2, respectively).

Conclusion: Precision-guided dosing provides substantial clinical and QoL benefits for adult CD patients by maintaining clinical remission and avoiding IFX failure; it is cost-effective relative to other DISs at a WTP of $175,000/QALY.



[0824] **Figure 1.** Precision-guided Dosing ICER Relative to DIS2 † Varied by ±10% * Varied by ±5% CD: Crohn's disease, DIS: dose intensification strategy, ICER: incremental cost-effectiveness ratio, IFX: infliximab, M-S: moderate-severe, PMPM: per member per month, Rem: remission

Table 1. Base Case Results (2-year Horizon Discounted)

DIS	Total QALYs	Total Costs	ICER Relative to Precision-guided Dosing	ICER Relative to DIS1	ICER Relative to DIS2	Incremental NMB vs DIS1 (WTP $150,000/QALY)	Incremental NMB vs DIS1 (WTP $50,000/QALY)	Incremental NMB vs DIS2 (WTP $150,000/QALY)	Incremental NMB vs DIS2 (WTP $50,000/QALY)
Precision-guided Dosing*	1.572	$50,753	-	171,810	127,990	-$765	-$4,274	$1,816	-$6,436
DIS1†	1.537	$44,725	171,810	-	95,581	-	-	$2,581	-$2,162
DIS2‡	1.489	$40,191	127,990	95,581	-	-$2,581	$2,162	-	-

DIS: dose intensification strategy, ICER: incremental cost-effectiveness ratio, NMB: net monetary benefit, QALY: quality-adjusted life year, WTP: willingness to pay.
*Model informed precision dosing with homogenous mobility shift assay (Prometheus Laboratories).
†Dose intensification based on a combination of symptoms, inflammatory markers and proactive therapeutic drug monitoring. Corresponds to cohorts 1 and 2 of the TAILORIX clinical trial.
‡Dose intensification reactive on symptoms only. Corresponds to cohort 3 of the TAILORIX clinical trial.

S825

Efficacy of Ozanimod in Vedolizumab-Exposed Patients With Ulcerative Colitis: A Phase 3 True North Post Hoc Analysis

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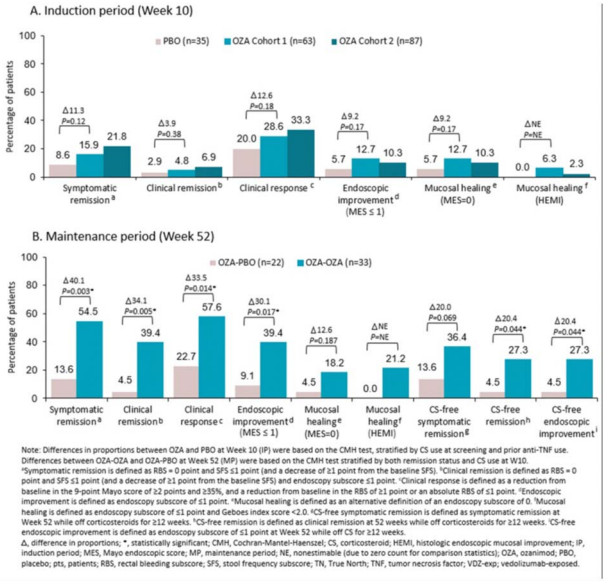
Introduction: Ozanimod (OZA), an oral S1P receptor modulator that prevents lymphocyte migration to inflamed tissues, is approved for the treatment of patients (pts) with moderate to severe ulcerative colitis (UC) in the US and EU. The phase 3 True North (TN) randomized trial showed that OZA was effective and well tolerated in these pts. OZA efficacy in pts who have been exposed to vedolizumab (VDZ-exp), an integrin receptor antagonist that interferes with lymphocyte trafficking to the gut, has not yet been described. This post hoc analysis of TN examined OZA efficacy in VDZ-exp pts.

Methods: In TN, pts were randomized to oral once-daily OZA 0.92 mg (equivalent to OZA HCl 1 mg) or placebo (PBO; Cohort 1) or to open-label OZA (Cohort 2) during the induction period (IP). Pts with a clinical response to OZA at Week (W) 10 were re-randomized to OZA or PBO in the maintenance period (MP). Efficacy at W10 (IP) and W52 (MP) in the VDZ-exp subgroup was calculated. Differences in proportions between OZA and PBO at W10 were based on the Cochran-Mantel-Haenszel (CMH) test, stratified by corticosteroid (CS) use at screening and prior anti-TNF use. Differences between OZA-OZA and OZA-PBO at W52 were based on the CMH test stratified by both remission status and CS use at W10. (Figure)

Results: TN included a total of 185 VDZ-exp pts (Cohort 1: PBO, n=35; OZA, n=63; and Cohort 2: OZA, n=87). Baseline (BL) demographics and clinical characteristics were balanced across treatment groups. In the VDZ-exp subgroup, 52% of pts had extensive disease at BL, 85% were previously exposed to anti-TNF, and 61% were receiving CS at BL. At W10, OZA (Cohort 1) was numerically more effective vs PBO for all endpoints in VDZ-exp pts (Figure 1A). Notably, in the subgroup of pts previously exposed to VDZ as a first-line advanced therapy, clinical response at W10 was achieved in 50% (6/12) of OZA pts in Cohort 1 and 42% (5/12) of OZA pts in Cohort 2. At W52, a higher proportion of VDZ-exp pts on continuous OZA achieved all efficacy endpoints vs the OZA-PBO group, with significant differences shown for most endpoints; OZA-OZA vs OZA-PBO differences at W52 were larger than OZA vs PBO differences at W10 (Figure 1B).

Conclusion: This post hoc analysis of the phase 3 TN study found that OZA was effective in UC pts who previously failed VDZ, including those who failed VDZ alone or following other advanced therapies. This subgroup analysis was limited by small sample sizes. Future studies evaluating OZA in VDZ-exp pts are warranted.



[0825] **Figure 1.** Ozanimod efficacy at TN IP (Week 10) and MP (Week 52) in VDZ-exp pts

S826

Baseline and Early Predictors of Response to Risankizumab Induction and Maintenance Treatment in Patients With Moderate to Severe Crohn's Disease

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Introduction: Pivotal phase 3 induction (ADVANCE and MOTIVATE) and maintenance (FORTIFY) studies established that treatment with risankizumab (RZB), a humanized monoclonal antibody with high specificity for the p19 subunit of interleukin-23, was superior to placebo for achieving clinical remission and endoscopic response in patients with moderate to severe Crohn's disease (CD). This exploratory analysis aimed to determine predictors of response to risankizumab induction and maintenance therapy.

Methods: Pooled data from patients in the RZB 600 mg intravenous (IV) dosing groups in ADVANCE + MOTIVATE induction studies (n=527) and data from the RZB 360 mg subcutaneous (SC) dosing group in FORTIFY (n=141) were evaluated. Multivariate logistic regression models were used to determine predictors of clinical and endoscopic outcomes at Weeks 12 and 52. For FORTIFY, separate logistic regression models were used to access end-of-induction characteristics for the achievement of outcomes at Week 52.

Results: Baseline characteristics found to be predictive of clinical and/or endoscopic outcomes at Week 12 and Week 52 are highlighted in the Table. Age and duration of disease were evaluated but were not predictive. Compared to patients with ileal disease, patients with colonic disease were more likely to achieve endoscopic endpoints at Week 12, while patients with ileal-colonic disease were more likely to achieve endoscopic response at Week 12; patients with either colonic or ileal-colonic disease were more likely to achieve endoscopic response at Week 52. Conversely, patients with prior bio-failure at BL were less likely to achieve endoscopic response at Week 12, and clinical and endoscopic responses at Week 52. Patients using corticosteroids at BL were less likely to achieve clinical endpoints at Weeks 12 and 52. Patients achieving clinical or endoscopic endpoints at Week 12 were more likely to achieve these endpoints at Week 52.

Conclusion: For patients treated with risankizumab, baseline disease location predicted achievement of endoscopic responses, corticosteroid use predicted achievement of clinical endpoints, and prior bio-failure status predicted achievement of both clinical and endoscopic endpoints at Week 52. Notably, achievement of clinical or endoscopic outcomes after induction with risankizumab were associated with a higher likelihood of achieving long-term clinical and endoscopic outcomes.

Table 1. Induction Baseline Characteristics and FORTIFY Week 0 Clinical Outcomes as Predictors of Week 12 Response to Risankizumab Induction and Week 52 Response to Risankizumab Maintenance Dosing

		Week 12 SF/APS Clinical Remission RZB 600 mg IV	Week 12 CDAI Clinical Remission RZB 600 mg IV	Week 12 CDAI Clinical Response RZB 600 mg IV	Week 12 Endoscopic Response RZB 600 mg IV	Week 12 Endoscopic Remission RZB 600 mg IV	Week 12 Ulcer-free Endoscopy RZB 600 mg IV	Week 52 SF/APS Clinical Remission RZB 360 mg SC	Week 52 CDAI Clinical Remission RZB 360 mg SC	Week 52 CDAI Clinical Response RZB 360 mg SC	Week 52 Endoscopic Response RZB 360 mg SC	Week 52 Endoscopic Remission RZB 360 mg SC	Week 52 Ulcer-free Endoscopy RZB 360 mg SC
Induction Baseline Characteristics as Predictors of Response Odds Ratio [95% CI] P-value	Colonic Disease Only	1.436 [0.766, 2.693] P=0.260	1.653 [0.883, 3.094] P=0.116	1.448 [0.774, 2.709] P=0.247	**5.178 [2.411, 11.123] P< 0.001**	**3.077 [1.425, 6.644] P=0.004**	**3.393 [1.510, 7.624] P=0.003**	0.654 [0.265, 1.614] P=0.357	0.886 [0.357, 2.203] P=0.795	0.938 [0.378, 2.328] P=0.890	**4.909 [1.468, 16.410] P=0.010**	2.135 [0.722, 6.317] P=0.170	2.428 [0.731, 8.060] P=0.147
	Ileal-colonic Disease Only	0.751 [0.411, 1.370] P=0.350	0.821 [0.451, 1.492] P=0.517	0.906 [0.506, 1.622] P=0.739	**2.880 [1.379, 6.017] P=0.005**	1.262 [0.590, 2.702] P=0.548	0.767 [0.331, 1.775] P=0.535	0.634 [0.263, 1.529] P=0.311	1.032 [0.426, 2.503] P=0.944	0.806 [0.333, 1.952] P=0.632	**4.351 [1.318, 14.366] P=0.016**	1.826 [0.627, 5.321] P=0.270	2.018 [0.617, 6.602] P=0.246
	Bio-Failure Status	0.675 [0.423, 1.076] P=0.098	0.789 [0.495, 1.258] P=0.320	0.867 [0.540, 1.393] P=0.556	**0.438 [0.271, 0.709] P< 0.001**	0.597 [0.352, 1.013] P=0.056	0.570 [0.317, 1.026] P=0.061	**0.425 [0.229, 0.787] P=0.006**	**0.373 [0.200, 0.698] P=0.002**	**0.426 [0.225, 0.805] P=0.009**	**0.443 [0.233, 0.844] P=0.013**	**0.444 [0.228, 0.863] P=0.017**	**0.295 [0.144, 0.606] P< 0.001**
	Corticosteroid Use	**0.506 [0.321, 0.799] P=0.003**	**0.491 [0.313, 0.769] P=0.002**	**0.440 [0.283, 0.683] P< 0.001**	0.742 [0.466, 1.181] P=0.208	0.786 [0.463, 1.334] P=0.372	0.891 [0.493, 1.609] P=0.701	**0.443 [0.243, 0.805] P=0.008**	**0.331 [0.178, 0.613] P< 0.001**	**0.374 [0.210, 0.668] P< 0.001**	0.796 [0.430, 1.474] P=0.468	0.787 [0.403, 1.539] P=0.485	0.939 [0.450, 1.959] P=0.866
Induction Week 12 Clinical Outcomes as Predictors of Response at Maintenance Week 52 Odds Ratio [95% CI] P-value	SF/APS Clinical Response							1.538 [0.969, 2.442] P=0.068	1.418 [0.894, 2.249] P=0.137	**1.596 [1.005, 2.535] P=0.048**	**2.880 [1.737, 4.774] P< 0.001**	**4.417 [2.466, 7.909] P< 0.001**	**3.517 [1.884, 6.565] P< 0.001**
	SF/APS Clinical Remission							**2.084 [1.095, 3.967] P=0.025**	1.429 [0.760, 2.684] P=0.268	1.704 [0.889, 3.267] P=0.109	**3.696 [1.904, 7.172] P< 0.001**	**5.368 [2.542, 11.337] P< 0.001**	**5.091 [2.264, 11.448] P< 0.001**
	Endoscopic Response							1.066 [0.527, 2.156] P=0.860	0.886 [0.438, 1.793] P=0.736	1.279 [0.613, 2.666] P=0.512	**3.592 [1.712, 7.540] P< 0.001**	**5.765 [2.663, 12.479] P< 0.001**	**6.314 [2.824, 14.120] P< 0.001**
	Endoscopic Remission							1.186 [0.503, 2.796] P=0.696	0.810 [0.344, 1.907] P=0.629	1.067 [0.433, 2.625] P=0.888	**4.342 [1.732, 10.887] P=0.002**	**9.227 [3.436, 24.776] P< 0.001**	**8.036 [2.934, 22.006] P< 0.001**

S827

Anorectal Manometry Protocols and Biofeedback Outcomes Vary for Patients With Ileal Pouch-Anal Anastomosis

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Introduction: Ileal pouch-anal anastomosis (IPAA) is commonly performed for patients with inflammatory bowel disease (IBD) requiring a total proctocolectomy (TPC). Emerging data suggests functional and evacuation disorders post-IPAA are common. The utility and role of anorectal manometry and biofeedback for patients with IPAA remain unclear. We aim to evaluate the role of ARM in diagnosing pouch evacuation disorders and efficacy of biofeedback.
Methods: We conducted a retrospective qualitative review of UC or IBD unspecified adult patients who underwent TPC with IPAA for refractory disease or dysplasia between 2008 and 2018 followed at one tertiary academic center. Demographics, clinical parameters and outcomes were collected in a REDCap database. Of the 794 patients with IPAA, 19 patients completed anorectal manometry at five centers.
Results: Our study included 19 patients (52.6% males) with an average age of 38.5 ± 14.5 years (standard deviation, SD) at time of ARM, an average of 3.6 ± 2.1 years after the final stage of IPAA. Seven patients had a history of pouch complications requiring pouch revision (36.8%). Five patients carried a diagnosis of pouchitis at the time of ARM (26.3%). The indications for completing ARM were incomplete defecation (47.4%), dyschezia (26.3%), diarrhea (15.8%), fecal incontinence (10.5%). ARM continuous parameters were not pooled given different manometry systems and protocols. 47.3% patients completed balloon expulsion tests (BET) at time of ARM (66.7% of which were abnormal). 52.6% patients were ultimately found to have pouchitis or mucosal changes on subsequent pouchoscopy (n=5) or structural etiologies on MRI defecography (n=5) which were thought to account for their defecatory symptoms. The recto-anal inhibitory reflex (RAIR) was absent in four patients (21.1%). Ten patients were recommended for biofeedback; of the eight patients who started biofeedback, only three completed biofeedback with significant subjective patient-reported improvement in symptoms (none with IPAA revisions) including one patient without a RAIR. Three of the eight patients stopped biofeedback because of no improvement. (Table)
Conclusion: Consensus guidelines are needed for positioning of ARM and MRI defecography for evaluation of defecatory symptoms post-IPAA as well as standardization of ARM protocol. The role of biofeedback in IPAA evacuatory disorders requires further investigation as well as validated criteria to assess improvement.

Table 1. Patient Characteristics and Anorectal Manometry Findings (Key: M, Male. F, Female. ARM, Anorectal Manometry. RAIR, IPAA, Ileal Pouch-Anal Anastomosis. BET, balloon expulsion test.)

Patient #	Sex	Age at ARM	IPAA Revision?	Indication	BET	Defecography	Opioid Use within 30 days of ARM	RAIR present?	ARM Findings	Biofeedback Response
1	M	64	Yes	Incomplete evacuation	-	-	Yes	Yes	Hyposensitive pouch, inability to completely relax.	2 sessions, no improvement
2	M	43	No	Dyschezia	-	-	Yes	Yes	High resting tone. No paradoxical contraction during evacuation	Not explicitly recommended
3	F	58	No	Fecal Incontinence	-	-	Yes	Absent	Hyposensitive pouch. Slight paradoxical contraction on evacuation	Completed, no improvement
4	F	56	No	Fecal Incontinence	-	-	-	-	Low resting tone, squeeze and push. No paradoxical contraction	Not explicitly recommended
5	M	21	No	Incomplete evacuation	Abnormal	Abnormal	-	Yes	Hypertonic sphincter. No paradoxical contraction during evacuation	Completed, significant improvement
6	F	36	Yes	Incomplete evacuation	-	-	Yes	Yes	Abnormal sensation. No paradoxical contraction during evacuation	Not explicitly recommended
7	M	32	No	Dyschezia	-	-	Yes	Absent	Spontaneous spasms of puborectalis. Paradoxical contraction during evacuation	Not explicitly recommended
8	M	22	No	Incomplete evacuation	Normal	Normal	-	Yes	No paradoxical contraction during evacuation	Not explicitly recommended

Table 1. (*continued*)

Patient #	Sex	Age at ARM	IPAA Revision?	Indication	BET	Defecography	Opioid Use within 30 days of ARM	RAIR present?	ARM Findings	Biofeedback Response
9	F	39	Yes	Dyschezia	Abnormal	-	Yes	Yes	No paradoxical contraction during evacuation	Completed, incomplete relief
10	F	63	No	Diarrhea	Normal	-	Yes	Yes	No paradoxical contraction during evacuation	Not explicitly recommended
11	M	32	Yes	Diarrhea	Abnormal	Normal	-	Yes	Paradoxical contraction during evacuation	Not explicitly recommended
12	M	20	Yes	Incompleteevacuation	-	-	-	Yes	Hyposensitive rectum. No paradoxical contraction during evacuation	Not explicitly recommended
13	F	35	No	Dyschezia	Normal	Normal	-	Yes	No paradoxical contraction during evacuation	Completed, incomplete relief
14	M	41	Yes	Diarrhea	Abnormal	-	-	Yes	Paradoxical contraction during evacuation	Not explicitly recommended
15	F	43	No	Incompleteevacuation	-	Abnormal	-	Yes	Mild paradoxical contraction evacuation	"Limited trial" with no improvement
16	F	23	Yes	Incompleteevacuation	-	Normal	Yes	Yes	Inadequate relaxation during evacuation	Recommended, not performed
17	M	34	No	Incompleteevacuation	Abnormal	-	-	Absent	Paradoxical contraction during evacuation	Completed, significant improvement
18	M	19	No	Dyschezia	-	Abnormal	-	Yes	Hyposensitive rectum. Paradoxical contraction during evacuation	Recommended, not performed
19	F	50	Yes	Incompleteevacuation	Abnormal	Normal	Yes	Absent	Paradoxical contraction during evacuation	5 sessions, with minimal improvement

S828

Evaluation of Treatment Patterns Among Crohn's Disease Patients Initiating Biologics With Three Years of Follow-Up

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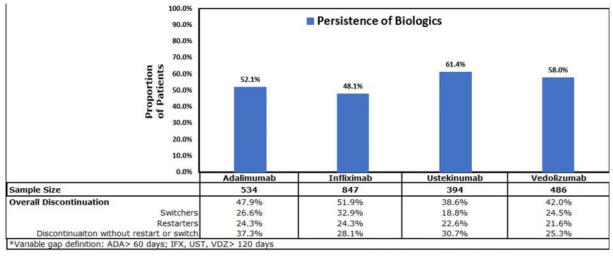
Introduction: This study examined biologic treatment patterns among Crohn's Disease (CD)-related patients initiating biologics over a 3-year follow-up period.
Methods: This descriptive study used All Payers Claims Data (APCD) from Sep 2015 to Oct 2021. Adult patients with ≥1 CD medical claim and ≥1 medical/pharmacy claim for a biologic (adalimumab [ADA], certolizumab pegol [CZP], infliximab [IFX] and its biosimilar products [IFX-BS], ustekinumab [UST], and vedolizumab [VDZ]) during Sep 2016 to Oct 2018 were selected. Index date was the first biologic claim date. Patients had continuous capture with commercial insurance for ≥12 months pre (baseline) and ≥36 months post index date (follow-up). Using a claims-based algorithm, confirmed CD patients were included in the final cohort. A persistent patient was one that remained on the index biologic without a gap of >60 days for ADA and CZP, and of >120 days for UST, IFX, IFX-BS, and VDZ between run-out dates of two sequential biologic claims. Patients who discontinued were classified as switchers (to another biologic), restarters (restarted index biologic), or discontinuers without switch and restart during follow-up.
Results: A total of 2,309 CD patients were identified (394 [17.1%] UST, 847 [36.7%] IFX, 72 [3.1%] IFX-BS, 534 [23.1%] ADA, 85 [3.7%] CZP, and 486 [21.1%] VDZ). Due to a small sample size, CZP and IFX-BS groups were excluded in further analyses. Approximately half of the CD patients were between age 35 to 54. Patients on UST and VDZ had numerically higher Charlson comorbidity index score at baseline. Common comorbidities among CD patients at baseline included anemia, anxiety, depression, fatigue, and hypertension (Table). UST [61.4%] patients had the highest persistence rate numerically in year 3 after treatment initiation, followed by VDZ [58.0%], ADA [52.1%], and IFX [48.1%] (Figure). Numerically, UST [18.8%] had the lowest switch rate, followed by VDZ [24.5%], ADA [26.6%], and IFX [32.9%].
Conclusion: UST had the highest persistence and lowest switch rate numerically in year 3 after treatment initiation among patients with CD.



[0828] **Figure 1.** Persistence Among Crohn's Disease Patients Using Biologics Over3 Years of Follow-up*

Table 1. **Descriptive Baseline Characteristics Among Crohn's Disease Patients**

Characteristics	Adalimumab (N=534)	Infliximab (N=847)	Ustekinumab (N=394)	Vedolizumab (N=486)
Age, mean	43.5	43.7	44.0	45.3
Age group, years				
18-34	24.0%	26.4%	25.6%	20.0%
35-54	52.4%	47.2%	48.5%	52.3%
55-64	23.6%	26.3%	25.9%	27.8%
Sex				
Male	45.7%	42.0%	46.7%	43.6%
Female	54.3%	58.0%	53.3%	56.4%

Table 1. (*continued*)

Characteristics	Adalimumab (N=534)	Infliximab (N=847)	Ustekinumab (N=394)	Vedolizumab (N=486)
US geographic region				
Northeast	14.0%	19.0%	17.5%	19.5%
North Central	33.1%	33.1%	37.3%	35.2%
South	37.6%	30.7%	30.5%	31.5%
West	15.2%	17.2%	14.7%	13.8%
Index Year				
2016	14.2%	13.2%	7.9%	13.4%
2017	56.7%	55.1%	53.0%	51.4%
2018	29.0%	31.6%	39.1%	35.2%
Charlson comorbidity index score	0.5	0.5	0.7	0.6
Comorbidities				
Anemia	17.4%	16.9%	30.2%	21.0%
Anxiety	14.0%	12.8%	19.8%	17.5%
Atherosclerosis	0.2%	0.5%	0.5%	0.0%
Celiac disease	1.1%	2.1%	6.1%	2.9%
Cholelithiasis	0.6%	0.0%	0.3%	0.2%
Chronic pain	5.8%	4.7%	8.9%	8.2%
Depression	14.2%	12.4%	18.3%	17.3%
Diabetes	6.2%	6.3%	7.4%	7.2%
Fatigue	7.7%	8.6%	14.2%	11.3%
Fistula	3.4%	6.7%	6.3%	6.0%
Hyperlipidemia	9.2%	9.3%	9.6%	10.7%
Hypertension	18.9%	15.7%	20.3%	17.5%
Obesity	10.1%	9.4%	11.7%	9.9%
Venous Thromboembolism	0.7%	1.5%	2.8%	1.6%

S829

Medical Management of Post-Operative Crohn's Disease

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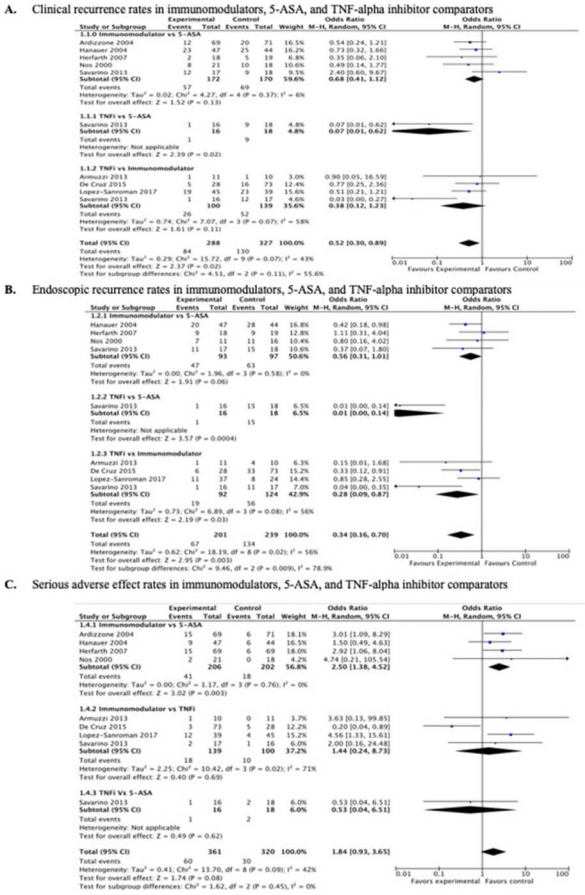
Introduction: Approximately half of patients with Crohn's disease (CD) will have a bowel resection within their first ten years of diagnosis. The American Gastroenterological Association released guidelines in 2017 for post-operative Crohn's management. The goal of our study was to re-assess the data from the 2017 guidelines through 2022 and to perform a meta-analysis of current data on post-operative pharmacologic management in CD to maintain clinical and endoscopic remission.
Methods: We performed a systematic review of the literature using Medline, Embase, and Web of Science databases to identify RCTs assessing the medical management of post-operative CD. The primary outcomes assessed were clinical and endoscopic recurrence rates at one to two years post-operatively, identified using CD Activity Index and Rutgeerts scores, respectively. Secondary outcomes were to evaluate safety data of the different pharmacologic approaches. Two independent reviewers appraised each study using a strict inclusion criterion, with a third reviewer serving to adjudicate in cases of differing opinion. We then analyzed the data through RevMan 5.3, which reported random-effects risk ratios.
Results: After initial review, a total of 8 RCTs were included in our final analysis. The odds ratios of clinical and endoscopic recurrence in the immunomodulator versus 5-ASA group were 0.68 [95% Confidence Interval (CI) 0.41-1.12, p=0.37] and 0.56 (0.31-1.01, p=0.58), respectively. The risk of serious adverse effects (AEs) was 2.50 (1.38-4.52, p=0.003). In the TNF-alpha inhibitor (TNF) versus 5-ASA group, the clinical and endoscopic recurrence odds ratios were 0.07 (0.01-0. 62, p=0.02) and 0.01 (0.00-0.14, p=0.0004), respectively, while for serious AEs it was 0.53 (0.04-6.51, p=0.62). Finally, in the TNF versus immunomodulator group, the clinical and endoscopic recurrence odds ratios were 0.38 (95% CI 0.12-1.23, p=0.07) and 0.28 (95% CI 0.09-0.87, p=0.03); the risk for serious AEs was 1.44 (0.24-8.73, p=0.69) (Figure).
Conclusion: Our updated meta-analysis suggests that TNFs should be considered as first line treatment, as they exhibit superior rates of endoscopic remission and trend towards higher rates of clinical remission compared to immunomodulators and 5-ASA, while maintaining a similar rate of serious AEs. More studies are needed to further confirm this and to assess the role of newer medications, such as anti-integrin and interleukin-12/23 inhibitors, in maintaining remission in post-operative CD.



[0829] **Figure 1.** Rates of clinical and endoscopic recurrence and serious adverse effects associated with immunomodulators, 5-ASA, and TNF-alpha inhibitors for the maintenance of remission in post-operative CD.

S830

Fidaxomicin for Treatment of *Clostridioides difficile* Infection in Patients With Inflammatory Bowel Disease

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Introduction: Although fidaxomicin is an effective, first-line treatment for *Clostridioides difficile* infection (CDI), clinical trials demonstrating its efficacy have excluded patients with inflammatory bowel disease (IBD) and its effectiveness in this patient population is unclear. We aimed to assess the effectiveness of fidaxomicin in patients with IBD for the treatment of CDI.
Methods: This was a retrospective study of adult patients with IBD who were treated with fidaxomicin for CDI from 1/2017 through 12/2021 at three academic tertiary medical centers. Patient information obtained from the electronic medical record included demographics, IBD subtype and treatments, and history of CDI and treatments. CDI was defined as >3 loose bowel movements per day or change from baseline in active IBD and positive toxin enzyme immunoassay or PCR for toxigenic *C. difficile*. Patients were treated with fidaxomicin 200 mg twice daily for 10 days, or twice daily for 5 days followed by an extended regimen. The primary outcomes were treatment response, defined as resolution of diarrhea and/or negative CDI stool test, and time to CDI recurrence after fidaxomicin. Fisher's exact test was used to evaluate the association between clinical factors and the primary outcomes.
Results: Thirty-eight patients met inclusion criteria. Patient characteristics and outcomes are listed in Table. Twenty-nine (76.3%) patients had one or more prior episodes of CDI before fidaxomicin treatment, and in 23 (60.5%) fidaxomicin was used after non-response to another first-line treatment. Resolution of CDI with fidaxomicin occurred in 60.5% (23/38) of patients, and 30.4% (7/23) developed CDI recurrence after treatment response. Nearly half (44.7%) of patients underwent fecal microbiota transplant (FMT) following treatment with fidaxomicin. Patients with extensive or pan- ulcerative colitis phenotype had less CDI recurrence compared to left-sided colitis or proctosigmoiditis (89.9% vs. 33.7%, p=0.015). Patients with FMT for CDI before fidaxomicin had no CDI recurrence after fidaxomicin versus 8 (30.8%) patients with CDI recurrence without prior FMT (p=0.039).
Conclusion: In this patient cohort with IBD and CDI, approximately 60% responded to treatment with fidaxomicin, although CDI recurred in 35% of those patients. Almost one half of patients underwent FMT after receiving fidaxomicin. Larger controlled studies are needed to assess outcomes of fidaxomicin for CDI in IBD.

Table 1. Demographics, clinical characteristics of CDI and IBD, and patient outcomes

Variable	
Age, years (median, range)	43.5, 19-88
Female (#, %)	23, 60.5
Caucasian (#, %)	37, 97.3
Number of prior episodes CDI before fidaxomicin treatment (# of patients, %)	
0	10, 26.3
1	7, 18.4
2 or more	22, 57.9

Table 1. (*continued*)

Variable	
History of IBD (#, %)	
Ulcerative colitis/Indeterminate colitis	27, 71.1
Crohn's disease	11, 28.9
Biologic therapy at time of CDI (#, %)	20, 52.6
Fidaxomicin used after other failed first line therapy (#, %)	23, 60.5
Severity of CDI (#, %)	
Mild/moderate	26, 68.4
Severe	1, 2.6
Severe with complications	1, 2.6
Outcomes (#, %)	
Resolution of CDI with fidaxomicin	23, 60.5
Recurrent CDI after fidaxomicin treatment response	7, 30.4
Time to recurrence, days (median, range)	63, 5-69
Hospitalization	8, 21.1
Colectomy for severe CDI	1, 2.6
FMT following treatment with fidaxomicin	17, 44.7

S831

Obesity Is Associated With an Increased Risk of Colorectal Neoplasia in Patients With Inflammatory Bowel Disease

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Introduction: Obesity is associated with an increased risk of colorectal neoplasia, but this relationship has not been studied in patients with inflammatory bowel disease (IBD). Both IBD and obesity induce a chronic inflammatory state, so the combination of the two could have an additive or synergistic effect on risk of colorectal neoplasia. Given the increased baseline incidence of dysplasia among IBD patients, identifying modifiable risk factors, such as obesity, could have a significant impact on long term cancer-related outcomes.
Methods: We performed a retrospective case-control study of IBD colitis patients at an academic IBD Center between January 2006 and February 2022. Demographic and disease-related data, known risk factors for dysplasia, and median BMI during the follow-up period were obtained. Only patients with at least 5 years of colonoscopy reports were included. A case was defined as any patient with biopsy proven dysplasia—indefinite, low-grade, or high-grade—during the study period. A control was defined as any patient with absence of biopsy-proven dysplasia. Obesity was defined as BMI of 30 or greater. Univariate analysis was performed using T-test for continuous variables and chi-square for categorical variables. Multivariate analysis was performed using logistic regression to model dysplasia risk.
Results: 106 cases had biopsy-proven colorectal dysplasia (64 IND, 36 LGD, 10 HGD); 125 controls had no dysplasia. Number of colonoscopies ($p < 0.001$) IBD subtype ulcerative colitis ($p = 0.016$), maximum histologic severity ($p = 0.127$), pseudopolyps ($p = 0.162$), IBD duration ($p = 0.098$), sex ($p = 0.18$), age ($p < 0.001$), smoking history ($p = 0.048$), prior dysplasia ($p < 0.001$), and obesity ($p < 0.001$) were associated with dysplasia on univariate analysis. On multivariable regression, number of colonoscopies (OR 1.26, 95% CI 1.08 - 1.48, $p = 0.004$), prior dysplasia (OR 3.98, 95% CI 1.23 - 12.86, $p = 0.021$), and obesity (OR 2.90, 95% CI 1.21 - 6.95, $p = 0.017$) were each independently associated with increased dysplasia risk. (Figure)
Conclusion: Patients with IBD have an increased risk of colorectal neoplasia, but a variety of comorbid states may exacerbate this risk. Notably, we identified obesity as an independent risk factor for dysplasia. Further research is needed to determine whether this risk functions synergistically with IBD or just as an independent risk factor. Furthermore, targeted weight-loss interventions may reduce the incidence of dysplasia among patients with IBD.

Variable		Dysplasia N = 106	%	No Dysplasia N = 125	%	p
Number of colonoscopies	Mean	5.29		3.90		**< 0.001**
IBD Subtype						**0.016**
	Crohns	34	32.1	54	43.2	
	UC	72	67.9	66	52.8	
	Unknown	0	0.0	5	4.0	
Active colitis		86	81.1	101	80.8	0.541
Maximum disease extent						0.271
	L1	8	7.5	10	8.0	
	L2	15	14.2	17	13.6	
	L3	8	7.5	13	10.4	
	E1	12	11.3	4	3.2	
	E2	17	16.0	5	4.0	
	E3	29	27.4	6	4.8	
	Other	17	16.0	34	27.2	
Maximum histological severity						**0.127**
	Inactive	17	16.0	20	16.0	
	Mild	28	26.4	38	30.4	
	Moderate	25	23.6	40	32.0	
	Severe	31	29.2	21	16.8	
Maximum endoscopic severity						
	Inactive	23	21.7	34	27.2	0.423
	Mild	31	29.2	32	25.6	
	Moderate	32	30.2	44	35.2	
	Severe	18	17.0	14	11.2	
Strictures		13	12.3	16	12.8	0.903
Pseudopolyps		46	43.4	43	34.4	**0.162**
Any short tubular colon		1	0.9	0.0	0.0	0.276
IBD duration	Mean (years)	17.6	16.6	13.85	11.1	**0.098**
Sex					0.0	**0.180**
	Female	50	47.2	70.00	56.0	
	Male	56	52.8	55.00	44.0	
Age	Mean (years)	54.1	51.0	46.28	37.0	**0.000**
Smoking history						**0.048**
	Never	59	55.7	88.0	70.4	
	Former	43	40.6	34.0	27.2	
	Current	4	3.8	2.0	1.6	
Diagnosis of PSC		4	3.8	3.0	2.4	0.559
History of Diabetes		15	14.2	14.0	11.2	0.500
History of non-melanomatous neoplasia		22	20.8	19.0	15.2	0.310
FH of CRC in 1st degree relative		16	15.1	14.0	11.2	0.393
Prior dysplasia		21	19.8	7.0	5.6	**0.002**
Medication exposure						0.233
	Never	11	10.4	22.0	17.6	
	Former	32	30.2	30.0	24.0	
	Current	62	58.5	73.0	58.4	
BMI	Median (kg/m^2)	27.32	25.8	25.45	20.4	**0.008**

Figure 1. Comparing demographic and IBD-related risk factors for developing colorectal dysplasia in a cohort of 231 IBD patients; *p* values <0.2 were included in the multivariable logistic regression and are bolded.
Abbreviations: BMI = body mass index, FH = family history, IBD = inflammatory bowel disease, PSC = primary sclerosing cholangitis. Medication Exposure = 5-ASA; immunomodulators- AZA/6MP, MTX; biologics - IFX, ADA, CTZ, GOL, UST, VEDO; small molecules - TOFA)

	OR	Std. Err.	z	p	95% CI
IBD Subtype	1.373	0.452	0.960	0.335	0.721- 2.618
Histologic Severity	1.063	0.196	0.330	0.740	0.741 - 1.526
Pseudopolyp	1.309	0.503	0.700	0.483	0.616 - 2.779
IBD Duration	0.997	0.013	-0.210	0.831	0.971 - 1.024
Sex	1.351	0.477	0.850	0.395	0.676 - 2.701
Age	1.023	0.012	1.890	0.058	0.999 - 1.048
Smoking History	1.256	0.437	0.660	0.512	0.635 - 2.485
Prior Dysplasia	3.980	2.381	2.310	**0.021**	1.232 - 12.855
Obesity	2.899	1.294	2.390	**0.017**	1.209 - 6.954
Number of Colonoscopies	1.260	0.102	2.860	**0.004**	1.076 - 1.477

[0831] **Figure 1.** Univariate Analysis and Multivariable Regression of Risk Factors for Dysplasia in IBD Patients.

S832

Impact of Opioid Use Disorder on Resource Utilization in Patients Admitted With Inflammatory Bowel Disease: A Nationwide Analysis

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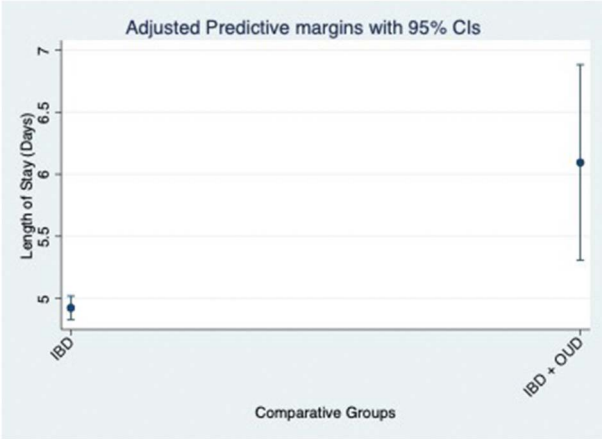
Introduction: Opioids are widely used for pain management in Inflammatory Bowel Disease (IBD). Thus, IBD patients are more prone to developing Opioid Use Disorder (OUD). Therefore, our study aimed to evaluate the impact of OUD on resource utilization in patients hospitalized with IBD in the US.
Methods: National Inpatient Sample (NIS) for 2019 was queried using ICD-10-CM Codes to identify a cohort of inpatient IBD admissions with and without OUD. A weighted sample was used to get baseline characteristics and resource utilization (length of stay and total hospital charges) during the inpatient admissions. Then, multivariate linear regression analysis followed by predictive margins of the model was used to get adjusted estimates of the length of stay and total hospital charges.
Results: Among 92740 patients admitted with IBD, 2335 (2.5%) had a concurrent diagnosis of OUD. Patients with OUD were comparatively younger (42.9 vs. 46.7) and predominantly Caucasians (79.1%). Our cohort was broadly admitted to large urban teaching hospitals. Compared to patients with OUD, there were larger proportions of patients with private insurance without OUD (24.6% vs. 48.5%). OUD was associated with a significantly longer length of stay in IBD patients, 6.10 days (95% CI 5.31-6.88) vs. 4.92 days (95% CI 4.83-5.02) for patients without OUD in the adjusted model. Total hospital charges were also higher, 77013 (95% CI 50604-103421) with OUD vs. 51399 (95% CI 49133-53665) for patients without OUD. In addition, 6% of patients with OUD were discharged against medical advice compared to 2.2 % of patients without OUD. (Figure)
Conclusion: Our study shows that OUD was associated with increased resource utilization in patients admitted with IBD. They had a longer length of stay despite an increased number of these patients leaving against medical advice. It resulted in increased hospital charges. Careful attention is needed to monitor disease status and pain severity in both inpatient and outpatient settings to decrease hospitalization and resource utilization. Future studies are needed with better cohort stratification to assess mitigating factors to OUD in patients with IBD. (Table)



[0832] **Figure 1.** IBD= Inflammatory Bowel Disease ; IBD+OUD= Inflammatory Bowel Disease with Opioid Use Disorder

Table 1. Adjusted for Age, Charlson Comorbidity Index, Hospital (Location, Teaching status, Bed Size), Insurance status

Variables	IBD without OUD (90405)	IBD with OUD (2335)	p-value
a) Baseline Patient and Hospital Characteristics			
Age (SD)	46.7 (18.4)	42.9 (13.2)	< 0.01
Female (%)	49030 (54.2)	1150 (49.3)	0.04
Race (%)			0.07
White	65285 (73.7)	1820 (79.1)	
Charlson Comorbidity Index (SD)	0.72 (1.3)	0.79 (1.3)	0.20
Hospital Type (%)			
Urban	84395 (93.4)	2200 (94.2)	0.49
Teaching	70020 (77.5)	1835 (78.6)	0.59
Hospital Bed Size (Large)	46905 (51.9)	1290 (55.3)	0.06
Payer Information (%)			< 0.01
Medicare	24175 (27.8)	840 (36.6)	
Private Insurance	42180 (48.5)	565 (24.6)	
Disposition (%)			< 0.01
Home AMA Died	74325 (82.2) 1985 (2.2) 260 (0.3)	1820 (77.9) 140 (6.0) 10 (0.4)	
b) Resource Utilization			
LOS (Unadjusted)	4.91 (95% CI 4.81-5.02)	6.17 (95% CI 5.39-6.94)	< 0.01
LOS (Adjusted)	4.92 (95% CI 4.83-5.02)	6.10 (95% CI 5.31-6.88)	< 0.01
TOTAL CHARGES (Unadjusted)	51184 (95% CI 48817-53551)	77603 (95% CI 51333-103874)	0.05
TOTAL CHARGES (Adjusted)	51399 (95% CI 49133-53665)	77013 (95% CI 50604-103421)	0.05

IBD: Inflammatory Bowel Disease ; OUD: Opioid Use Disorder ; SD: Standard Deviation ; AMA: Against Medical Advice ; LOS: Length Of Stay.

S833

Gradient Boosted Decision Tree to Model Ustekinumab Trough Levels in Crohn's Disease

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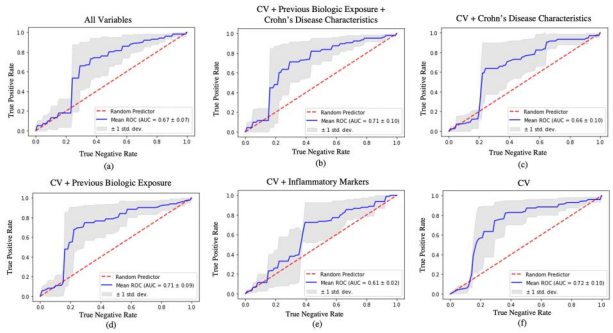
Introduction: Strategies for predicting ustekinumab (UST) trough levels with machine learning techniques can improve personalized care and aid in decision making for UST initiation or scheduling. The aim of this study was to identify variables capable of predicting an adequate UST response through a gradient boosted decision trees (GBDT) model.
Methods: A retrospective cohort of Crohn's disease (CD) patients from our quaternary referral center being treated with UST were reviewed for variables including age, gender, ethnicity, BMI, dosing schedule, time passed since starting UST, previously used biologics, disease duration, age of diagnosis, disease location, disease behavior, and measurements of inflammation. Measurements of inflammation included albumin, CRP, ESR, lactoferrin, calprotectin, Harvey Bradshaw index (HBI), SES-CD, Rutgeerts, and intestinal ultrasound results. Null values were replaced with the mean of the rest of the feature. As part of feature selection, a univariate analysis was conducted to determine which features significantly correlated with UST trough levels. These features were then used to train a multivariate GBDT model, which was then evaluated using a nested cross-validation framework. The gini importance of the features included in each model was then ranked and then averaged across the different models.
Results: 155 CD patients were identified in our cohort with UST trough levels obtained. Univariate analysis determined the following variables to be significant predictors: female gender, dosing schedule, time on UST, ESR, CRP, failed adalimumab, failed infliximab, failed certolizumab, and the Montreal classifications B1, B3, L1, L3. Results of various input variable combinations are outlined in Figure. The gini importance of features in each model is included in Table. Of the generated GBDT models, core variables only, and core variables with previous biologic exposure and CD characteristics were the best performing models with mean AUC of 0.72 ± 0.10 and 0.71 ± 0.09 respectively.
Conclusion: Within our study, this proof-of-concept study demonstrates how predictive models can be used to understand predictive variables for UST response, and when additional doses of UST might be necessary to achieve therapeutic levels. Our proof-of-concept models seem to illustrate that the most predictive variables for UST trough levels were time passed since starting UST, dosing schedule, ileocolonic disease, and previously failed anti-tumor necrosis factor agents.



[0833] **Figure 1.** Impact of variable combinations on Gradient Boosted Decision Tree (GBDT) model's area under the receiver operating characteristic curve (AUC). Graphs show mean (standard deviation) receiver operating characteristic (ROC) curves and AUCs for GBDT models with A) All variables B) Core variables (CV) plus previous biologic exposure and Crohn's disease characteristics, C) CV plus Crohn's Disease characteristics D) CV plus previous biologic exposure, E) CV plus inflammatory markers, and F) only CV. Core variables consist of, gender, dosing schedule, and time on UST. Inflammatory markers consist of, erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP). Previous biologic exposure includes adalimumab, infliximab, and certolizumab. Crohn's disease characteristics includes disease location, and disease behavior (stricturing vs fistulizing).

Table 1. Gini importance ranking of variables from different models

Variable	All	CV + previous biologic exposure + CD characteristics	CV + CD Characteristics	CV + previous biologic exposure	CV + Inflammatory Markers	CV	Average
Core Variables (CV)							
Gender	9	4	4	6	5	3	4
Dosing Schedule	5	2	3	3	4	2	2
Time on UST	1	1	1	1	1	1	1
Previous Biologic Exposures							
Failed Adalimumab	6	7	-	4	-	-	6
Failed Infliximab	10	6	-	2	-	-	5
Failed Certolizumab	7	8	-	5	-	-	7
CD Characteristics							
Non-stricturing, non-penetrating	12	10	6	-	-	-	11
Penetrating	11	5	5	-	-	-	10
Ileal Disease	8	9	7	-	-	-	12
Ileocolonic Disease	4	3	2	-	-	-	3
Inflammatory Markers							
CRP	2	-	-	-	2	-	8
ESR	3	-	-	-	3	-	9

Final column averages the gini importance from each model combination before ranking them in order of importance.

S834

Improvement in Fatigue With Mirikizumab Therapy Is Associated With Clinical Remission and Pain Improvements but Not With Endoscopic Response in Patients With Moderately-to-Severely Active Crohn's Disease

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Introduction: Fatigue is common in patients (pts) with Crohn's disease (CD) and negatively impacts quality of life. We previously reported that fatigue improved in pts with CD receiving mirikizumab (miri) in the AMAG study in all treatment arms. The association between changes in clinical and inflammatory markers and changes in fatigue might reveal the mechanism of fatigue relief.
Methods: 191 moderately-to-severely active CD pts were randomized 2:1:1:2 into 4 treatment arms (placebo [PBO], 200mg, 600mg, 1000mg miri), administered intravenously every 4 weeks at Weeks (W) 0, 4, 8. At W12 pts were switched from PBO to miri and rerandomized between miri doses based on response. Fatigue was assessed using the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) questionnaire. Endoscopic response was defined as ≥50% reduction from baseline in total Simplified Endoscopic Activity Score for Crohn's Disease. For continuous variables, Pearson's correlation coefficients, 95% confidence intervals, and p-values were calculated. Cohen's conventions were used to assess strength of correlations. Analysis of covariance was used to assess relationship between change in FACIT-F and endoscopic response at the same timepoint adjusting for baseline FACIT-F values. Data were pooled for all treatment arms including PBO.
Results: Mean change in FACIT-F scores for pts with and without endoscopic response at W12 were 8.1 and 7.2, respectively (p=0.33) and at W52 were 13.9 and 13.7, respectively (p=0.54). At W12, change in FACIT-F showed moderate but statistically significant correlation with change at the same timepoint in Crohn's Disease Activity Index (CDAI) total score, abdominal pain, and stool frequency. Weak but statistically significant correlations were observed with calprotectin, and C-reactive protein (Table). At W52, change in FACIT-F was moderately but significantly correlated with change in CDAI total score, abdominal pain, and stool frequency (Table).
Conclusion: Considering the limitation of the posthoc analysis and design of this Phase 2 trial, improvements in fatigue were significantly associated with improvement in CDAI score, abdominal pain, and stool frequency in patients with CD. Although fatigue has been hypothesized to be mediated in part by inflammatory cytokines, our data showed no consistent relationship of improvement in fatigue with changes in objective markers of disease activity, suggesting the possibility of alternative or additional mechanistic processes for fatigue in CD.

Table 1. **Correlation of change in FACIT-F with change in clinical measures**

	Week 12 (N=191)			Week 52 (N=176)		
Clinical measure	**Pearson corr**	**95% CI**	**p-value**	**Pearson corr**	**95% CI**	**p-value**
CDAI total score	-0.404	(-0.530, -0.259)	< 0.0001	-0.492	(-0.614, -0.346)	< 0.0001
SES-CD total score	-0.146	(-0.290, 0.004)	0.0572	-0.076	(-0.238, 0.090)	0.3702
Hematocrit (%)	-0.039	(-0.194, 0.119)	0.6319	0.152	(-0.016, 0.312)	0.0756
Hemoglobin	-0.011	(-0.167, 0.145)	0.8916	0.120	(-0.049, 0.282)	0.1638
Fecal calprotectin (log)	-0.269	(-0.419, -0.105)	0.0015	-0.175	(-0.342, 0.003)	0.0544
C-reactive protein (log)	-0.165	(-0.310, -0.013)	0.0331	-0.151	(-0.310, 0.016)	0.0756
Abdominal pain average score	-0.380	(-0.504, -0.240)	< 0.0001	-0.438	(-0.565, -0.292)	< 0.0001
Stool frequency average score	-0.354	(-0.481, -0.212)	< 0.0001	-0.290	(-0.437, -0.128)	0.0006

Abbreviations: CDAI=Crohn's Disease Activity Index; corr=correlation; N=number of patients in the analysis (including patients with non-missing change scores); FACIT-F=Functional Assessment of Chronic Illness Therapy-Fatigue; SES-CD=Simplified Endoscopic Activity Score for Crohn's Disease.

S835

Description of Clinical Presentations of Inflammatory Bowel Disease (IBD) in Individuals Who Identify as LGBTQIA+

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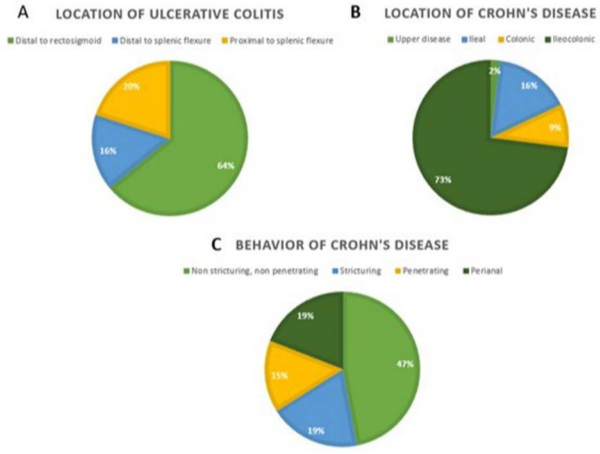
Introduction: While the demographics and clinical manifestations of Inflammatory Bowel Disease (IBD) have been widely described in the general population, little is known about the clinical presentation of patients belonging to the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA+) community. The aim of this study was to describe the clinical presentation of IBD in individuals who identify as LGBTQIA+ at their first presentation to an IBD clinic at a tertiary referral center.
Methods: This is a retrospective chart review study where patients that identify as LGBTQIA+ and that have IBD were identified using an electronic data retrieval system at a tertiary referral center. We collected information regarding their sexual orientation, gender identity (SOGI), gastrointestinal (GI) symptoms, location of disease, extent of GI tract involvement and their IBD medications at the time of their first visit to the IBD clinic. We used descriptive statistics to analyze the data.
Results: The demographics, SOGI, IBD diagnosis and medications of the 93 patients included in our study are described in Table. The median time (interquartile range) from symptom onset to diagnosis and to presentation to IBD clinic were 1.4 (0; 12.7) and 72.1 (10.3; 160.5) months respectively. The extent and location of bowel involvement at the initial visit are displayed in Figure. On presentation, 46% of patients reported abdominal pain, 45% diarrhea, 25% hematochezia, 16% weight loss and 15% fatigue. Ten percent of patients had a history of clostridium difficile colitis. There were 24 patients that had more than one IBD-related emergency department visit and 17 patients that had more than one hospitalization at a tertiary referral center within one year of presentation to IBD clinic. A history of mood or anxiety disorders was assessed in 41 patients (44%), 16 of which had a history of anxiety and 19 of depression. Indications of suicidality were only assessed in 10 patients (11%).
Conclusion: While this study is the first to help clarify the GI manifestations and disease characteristics of IBD in patients who identify as LGBTQIA+, further studies are needed to deepen our understanding of the epidemiology and clinical presentations of IBD in this population in comparison to a non-LGBTQIA+ cohort. This will facilitate the identification of potential healthcare disparities and barriers to timely access of patients who identify as LGBTQIA+ with IBD to clinical care.



[0835] **Figure 1.** Gastrointestinal involvement in patients who identify as LGBTQIA+ and who have ulcerative colitis (A, n=25) and Crohn's disease (B, n=45; C, n=32).

Table 1. **Demographics, sexual orientation, gender identity, IBD diagnosis and IBD medications of 93 individuals who identify as LGBTQIA+**

	All patients (n=93)
Age, in years, mean (SD)	30 (15)
Sex assigned at birth, Female, N(%)	59 (63)
Sexual orientation, N(%)	
Bisexual	48 (52)
Gay/lesbian/homosexual	39 (42)
Other	5 (5)
Prefer not to disclose	1(1)
Gender Identity, N(%)	

Table 1. (*continued*)

	All patients (n=93)
Female	52 (56)
Male	30 (32)
Genderqueer	2 (2)
Transgender female	2 (2)
Other	7 (8)
Race, N(%)	
White	85 (92)
Black	3 (3)
American indian/Alaska native	1 (1)
Asian	1 (1)
Native Hawaiian/Pacific Native Islander	1 (1)
Other	2 (2)
IBD diagnosis, N(%)	
Ulcerative colitis	48 (52)
Crohn's Disease	45 (48)
IBD medications at initial visit, (n=37)	
Mesalamine	20 (54)
Corticosteroids	15 (41)
Thiopurines	10 (27)
Infliximab	8 (21)
Adalimumab	7 (19)
Vedolizumab	2 (5)
Ustekinumab	2 (5)
Certolizomab	2 (5)
Methotrexate	1 (3)

IBD: Inflammatory Bowel Disease; Data shown: Number (percentage), unless stated otherwise.

S836

Health-Related Quality of Life of Week 8 Responders and Non-Responders: Results from the RBX2660 Phase 3 Randomized, Placebo-Controlled Trial in Recurrent *Clostridioides difficile* Infection (PUNCH CD3)

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[1]PACT Gastroenterology Center and Yale University School of Medicine, New Haven, CT; [2]Washington University School of Medicine, St. Louis, MO; [3]Ferring Pharmaceuticals, Parsippany, NJ; [4]Rebiotix Inc., a Ferring Company, Roseville, MN; [5]Analysis Group, Inc., Boston, MA; [6]Analysis Group, Inc., New York, NY; [7]GST Micro, North, VA; [8]University of Houston College of Pharmacy, Houston, TX.

Introduction: Recurrent *Clostridioides difficile* infection (rCDI) substantially compromises patients' health-related quality of life (HRQL). RBX2660, a live biotherapeutic product (LBP), was found to reduce rCDI. Here we report post-hoc HRQL results of responders (with no recurrence) and non-responders (with a recurrence) within an 8-week blinded period of the RBX2660 phase 3 randomized placebo-controlled trial PUNCH CD3 (NCT03244644).
Methods: We analyzed the *Clostridioides difficile* Health-related Quality-of-Life Questionnaire (Cdiff32), a validated disease-specific instrument with three domains (physical, mental, and social) and a total score (all range from 0–100, 100 best possible). Changes in Cdiff32 from baseline to week 8 were summarized for responders and non-responders, respectively, for RBX2660 and placebo (PBO). Per trial protocol, patients experiencing recurrence after blinded treatment received open-label RBX2660 per physician discretion; these participants were excluded. Adjusted regressions were conducted among responders only due to low sample size of non-responders, and controlling for baseline score, age, sex, number of prior CDI episodes, and other covariates. As-observed data were used.
Results: Among patients with available Cdiff32 at baseline and week 8, 178 patients (125 RBX2660, 53 PBO) were responders and 7 (3 RBX2660, 4 PBO) were non-responders. Responders were aged (mean±SD) 59.3±16.7 yrs, 68.5% female; non-responders were aged 66.4±16.4 yrs, 85.7% female. Among responders, improvements from baseline to week 8 were statistically significant (all $p < 0.001$) for both arms and all Cdiff32 scores (Table). Adjusted analyses among responders found a statistical difference favoring RBX2660 vs PBO at week 8 for the mental domain (7.4, 95% confidence interval: [0.33, 14.43], $P < 0.05$). Among non-responders, numerical improvements in all four scores were observed for RBX2660, while scores remained similar from baseline to week 8 for PBO.
Conclusion: HRQL of rCDI patients treated with RBX2660 and with standard antibiotic treatment (PBO) improved significantly among the responders, with a greater magnitude for RBX2660, particularly for mental health. Among the few non-responders, an average improvement in 10 to 20 points on Cdiff32 was observed for RBX2660-treated patients though not among PBO-treated patients. These findings suggest future research is warranted to further evaluate the potential impact of LBP on HRQL of patients with rCDI.

Table 1. Cdiff32 component scores at baseline and week 8 by treatment arm and response status

	RBX2660				Placebo			
Component (Mean ± SD)	**Baseline**	**Week 8**	**Change from baseline**	**Unadjusted P-value**	**Baseline**	**Week 8**	**Change from baseline**	**Unadjusted P-value**
Responders								
Total	43.7 ± 17.4	75.8 ± 18.3	32.1 ± 21.4	< 0.001 *	42.4 ± 20.3	70.1 ± 23.2	27.7 ± 19.8	< 0.001 *
Physical	52.6 ± 21.1	84.2 ± 16.9	31.7 ± 22.8	< 0.001 *	49.9 ± 22.7	79.2 ± 21.6	29.3 ± 23.2	< 0.001 *
Mental	32.7 ± 16.8	66.4 ± 22.0	33.7 ± 24.1	< 0.001 *	33.0 ± 20.5	60.1 ± 27.0	27.0 ± 21.4	< 0.001 *
Social	53.5 ± 23.6	80.2 ± 21.3	26.6 ± 27.9	< 0.001 *	49.3 ± 26.5	73.6 ± 27.8	24.3 ± 27.3	< 0.001 *
Non-responders								
Total	61.5 ± 16.7	76.3 ± 5.9	14.8 ± 16.4	0.423	59.0 ± 31.0	57.2 ± 35.0	-1.8 ± 25.6	0.854

Table 1. (*continued*)

	RBX2660				Placebo			
Component (Mean ± SD)	Baseline	Week 8	Change from baseline	Unadjusted P-value	Baseline	Week 8	Change from baseline	Unadjusted P-value
Physical	78.0 ± 14.9	91.1 ± 4.7	13.1 ± 19.3	0.423	62.5 ± 35.3	62.1 ± 37.8	-0.5 ± 30.8	0.855
Mental	47.0 ± 19.6	60.7 ± 15.6	13.7 ± 16.2	0.181	54.9 ± 27.7	50.0 ± 33.2	-4.9 ± 23.3	0.854
Social	54.2 ± 15.7	79.2 ± 3.6	25.0 ± 16.5	0.181	60.9 ± 33.2	65.6 ± 34.8	4.7 ± 22.5	1.000

S837

Risk of Adverse Cardiovascular Outcomes in Postmenopausal Women With Inflammatory Bowel Disease

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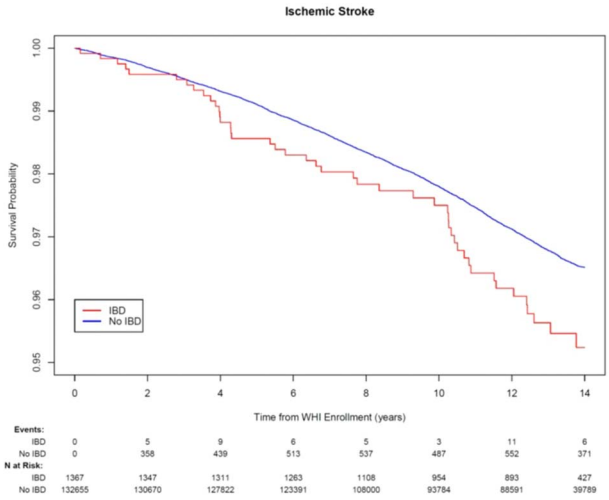
Introduction: Previous studies suggest an increased risk of adverse cardiovascular (CV) outcomes among individuals with inflammatory bowel disease (IBD). This increased risk is observed in the absence of traditional CV risk factors such that younger (< 40-50 years) and female individuals with IBD are observed to be at higher risk of coronary heart disease and stroke than their non-IBD counterparts. The risk of adverse CV outcomes specifically among older postmenopausal women with IBD is unclear.
Methods: We performed a survival analysis of participants enrolled in the Women's Health Initiative (WHI, 1993-2010). Participants in both the WHI clinical trials (hormone therapy, diet modification, calcium/vitamin D) and observational study were included. We excluded participants with missing data on self-reported IBD diagnosis at enrollment, missing model covariate data, no follow-up data, or a previous history of one of the CV outcomes of interest: coronary heart disease (CHD), ischemic stroke, venous thromboembolism (VTE), or peripheral arterial disease (PAD). We assessed the risk of each outcome between women with and without IBD using Cox proportional hazard models, stratified by WHI trial group and WHI follow-up period. Models were adjusted for age, socio-demographics and comorbidities (e.g. treated hypertension, diabetes, or hypercholesterolemia), as well as family history and lifestyle factors (e.g. smoking, alcohol, physical activity).
Results: Of the 134,022 women included in the study, IBD was reported at baseline in 1,367 (1.02%). The mean baseline age for women with and without IBD was 63 years. After adjusting for age and other potential confounders, no significant difference was observed in women with versus without IBD for the risk of CHD (HR 0.98, 95%CI 0.75-1.27), VTE (HR 1.13, 95%CI 0.82-1.55) or PAD (HR 0.65, 95% CI 0.29-1.47). After adjusting for age, the risk of ischemic stroke was significantly higher (HR 1.41, 95%CI 1.06-1.88) in women with compared to those without IBD. On further adjustment for socio-demographics, comorbidities, family history, and lifestyle factors, the increased risk of ischemic stroke among women with IBD remained statistically significant although attenuated (HR 1.34, 95%CI 1.00-1.80).
Conclusion: Among post-menopausal women, risk of ischemic stroke may be increased in those with compared to those without IBD. Accounting for traditional CV risk factors, such as metabolic comorbidities and lifestyle may attenuate the risk.



[0837] **Figure 1.** Kaplan-Meier Plot of Ischemic Stroke Associated with Inflammatory Bowel Disease in Post Menopausal Women.

Table 1. **CHD, coronary heart disease; VTE, venous thromboembolism; PAD, peripheral arterial disease**

Outcome		IBD	No IBD	
CHD	Events (Ann%)	57 (0.36)	5385 (0.35)	
		HR (95% CI)	HR (95% CI)	p-value
	Model 1	1.05 (0.81, 1.37)	1.00 (ref)	0.69
	Model 2	0.99 (0.76, 1.28)	1.00 (ref)	0.92
	Model 3	0.98 (0.75, 1.27)	1.00 (ref)	0.87
Ischemic Stroke	Events (Ann%)	47 (0.30)	3329 (0.21)	
		HR (95% CI)	HR (95% CI)	p-value
	Model 1	1.41 (1.06, 1.88)	1.00 (ref)	0.02
	Model 2	1.35 (1.01, 1.81)	1.00 (ref)	0.04
	Model 3	1.34 (1.00, 1.80)	1.00 (ref)	0.05
VTE	Events (Ann%)	40 (0.25)	3251 (0.21)	
		HR (95% CI)	HR (95% CI)	p-value

Table 1. (*continued*)

Outcome		IBD	No IBD	
	Model 1	1.23 (0.90, 1.68)	1.00 (ref)	0.20
	Model 2	1.14 (0.83, 1.56)	1.00 (ref)	0.42
	Model 3	1.13 (0.82, 1.55)	1.00 (ref)	0.45
PAD	Events (Ann%)	6 (0.04)	871 (0.06)	
		HR (95% CI)	HR (95% CI)	p-value
	Model 1	0.68 (0.31, 1.52)	1.00 (ref)	0.35
	Model 2	0.67 (0.30, 1.49)	1.00 (ref)	0.33
	Model 3	0.65 (0.29, 1.47)	1.00 (ref)	0.30

Hazard ratios and p-values form proportional hazards models with the outcome of interest as a function of IBD status at enrollment. All models are stratified within the model by WHI component (clinical trial / observational study, hormone use (never, past, current; incorporating WHI HT trial component), WHI Dietary Modification Trial arm (intervention, comparison, not randomized), and time-dependent WHI follow-up period (WHI, extension 1, extension 2) Model 1: Adjusted for age Model 2: Model 1 + ethnicity, race, education, treated hypertension, treated diabetes, treated hypercholesterolemia, family hx of MI, family hx of stroke, rheumatoid arthritis, lupus, BMI Model 3: Model 2 + smoking, alcohol, physical activity, visit to regular doctor in the past year, any insurance.

S838

Health-Related Quality of Life in Patients With One Prior Episode of Recurrent *Clostridioides difficile* Infection (rCDI): Results from the RBX2660 Phase 3 Randomized, Placebo-Controlled rCDI Trial (PUNCH CD3)

Paul Feuerstadt, MD, FACG[1], Erik R. Dubberke, MD, MSPH[2], Amy Guo, PhD[3], Adam Harvey, PhD[4], Min Yang, MD, PhD, MS[5], Viviana Garcia-Horton, PhD[6], Mirko Fillbrunn, PhD[5], Jonathan Salcedo, PhD[5], Glenn Tillotson, PhD[7], Lindy Bancke, PharmD[4], Kevin W. Garey, PharmD, MS, FASHP, FIDSA, FCCP[8].
[1]PACT Gastroenterology Center and Yale University School of Medicine, New Haven, CT; [2]Washington University School of Medicine, St. Louis, MO; [3]Ferring Pharmaceuticals, Parsippany, NJ; [4]Rebiotix Inc., a Ferring Company, Roseville, MN; [5]Analysis Group, Inc., Boston, MA; [6]Analysis Group, Inc., New York, NY; [7]GST Micro, North, VA; [8]University of Houston College of Pharmacy, Houston, TX.

Introduction: RBX2660 is an investigational live biotherapeutic product (LBP) for the reduction of recurrent *Clostridioides difficile* infection (rCDI). PUNCH CD3, a RBX2660 phase 3 randomized placebo (PBO) controlled trial (NCT03244644), included patients with at least one prior rCDI episode and at least one round of standard-of-care oral antibiotic therapy, or with at least two episodes of severe CDI resulting in hospitalization within the prior year. Here we report post-hoc analyses of health-related quality of life (HRQL) within an 8-week blinded period for a subgroup of patients in the trial who had the first recurrence.
Methods: HRQL impact (based on *Clostridioides difficile* Health-related Quality-of-Life Questionnaire [Cdiff32]) was estimated for RBX2660 and PBO arms. The disease-specific Cdiff32 comprises three domains (physical, mental, social) and a total score; scores range from 0–100 (100 best possible). Per trial protocol, patients experiencing recurrence after blinded treatment received open-label RBX2660 per physician discretion; these participants were excluded. We summarized between-treatment differences in Cdiff32 scores from baseline to week 8, and adjusted regressions were conducted controlling for baseline Cdiff32 score, age, sex, number of prior CDI episodes, and other covariates. As-observed data were used.
Results: Of 262 enrolled patients, 86 patients (53 RBX2660, 33 PBO) had 1 prior rCDI episode (33% of all trial patients). Among these, 66 patients (76.7%) had Cdiff32 data at baseline and week 8 (43 RBX2660, 23 PBO), aged (mean±SD) 57.6±18.2 years, with 65.2% female. Unadjusted analyses showed statistically significant greater HRQL improvements with RBX2660 vs PBO for total score (13.5±5.7, $p< 0.05$) and mental domain (16.2±6.0, $p< 0.01$), and nonsignificant for physical (11.9±6.1, $p=0.07$) and social (7.6±7.4, $p=0.45$) domains (Table). Adjusted analyses showed statistically significant differences (all $p< 0.05$) for total score (11.03, 95% confidence interval: [1.34; 20.72]), physical (10.74, [1.36; 20.13]) and mental (13.07, [2.02; 24.13]) domains.
Conclusion: No prior research has reported HRQL impact of an investigational LBP in rCDI patients with 1 prior rCDI. Our findings demonstrated significantly more improvements in HRQL for RBX2660-treated patients in this subgroup of patients. Future research is needed to further evaluate benefits when treating rCDI patients early.

Table 1. Cdiff32 component scores at baseline and week 8 by treatment arm

	Baseline score		Week 8 score			
Component (Mean ± SD)	RBX2660	Placebo	RBX2660	Placebo	Difference-in-difference	Unadjusted P-value
Total	40.7 ± 15.7	47.3 ± 20.8	75.9 ± 18.6	69.0 ± 23.4	13.5 ± 5.7	< 0.05 *
Physical	47.3 ± 19.4	51.7 ± 22.2	84.2 ± 16.9	76.6 ± 24.1	11.9 ± 6.1	0.07
Mental	31.7 ± 15.0	40.8 ± 21.8	66.5 ± 22.2	59.4 ± 25.3	16.2 ± 6.0	< 0.01 *
Social	51.6 ± 22.0	54.6 ± 26.3	80.4 ± 21.8	75.8 ± 24.7	7.6 ± 7.4	0.45

S839

Utility of Intestinal Ultrasound (IUS) and Its Comparison to Other Diagnostic Modalities in Patients With Crohn's Disease: A Systematic Review and Meta-Analysis

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Introduction: Intestinal Ultrasound (IUS) is a relatively new modality being used for diagnostic purposes in the inflammatory bowel disease world. In the latest studies, IUS has performed comparable to other modalities and also correlates with biochemical disease markers. In our study, we planned to compare the results of this modality compared to other modes.
Methods: 17 articles were included for review. A search was completed through PubMed, Oxford Academic and American Gastroenterology journal.Comparison of sensitivity, specificity, and accuracy was done between IUS and other procedures in the studies identified.Total sample of all studies N =964 (46% Female). Mean age of all studies M=38.80. We calculated weighted average of certain variables during the analysis.
Results: In nine studies, IUS had a mean Sensitivity of .90 (SD = 0.15) while other procedures demonstrated a mean Sensitivity of .77 (SD = 0.15),in a one sided test this was a significant difference, $t(8) = 1.92$, $p = .045$,which corresponded with an effect size of d = 0.64 (95% CI = -0.09 / 1.34). In eight studies examining both Specificity in IUS and other procedures, IUS had a mean Sensitivity of .78 (SD = 0.14) while other procedures demonstrated a mean Specificity of .82 (SD = 0.22), with a non-significant difference, $t(7) = -0.52$, $p = .308$, d = -0.18 (95% CI = -0.88 / 0.52). Three studies compared ICU and other procedures in accuracy. IUS had a mean Accuracy of .75 (SD = 0.04) while other procedures demonstrated a mean Specificity of .72 (SD = 0.14), which was a non-significant difference, $t(2) = 0.29$, $p = .400$, d = 0.17 (95% CI = -0.99 / 1.29). Procedural factors which may affect Sensitivity, Specificity, and Accuracy in the IUS procedure were examined if there were at least 3 studies available to make a comparison. Stricture Stenosis, abscess, dilation, fistula formation was associated with greater Sensitivity & Specificity in IUS while MRE was assumed with greater Sensitivity and Specificity when not present. Effect sizes calculated should be taken with caution due to the small number of studies and the large 95% confidence intervals associated with each effect. (Figure)
Conclusion: IUS evaluation of CD flare offers an alternative noninvasive modality that is comparable while limiting radiation exposure. This allows providers the ability to monitor for resolution of pathology at bedside as well and status changes during follow up visits. A limitation of this study is the lack of information however it provides a continued area of research.

	Sensitivity	Specificity	Accuracy
Inflammatory Changes (0=11, 1=4)	0 M = .85, SD = 0.15, N =11 1 M = .80, SD = 0.22, N =4 d = 0.28 (95% CI = -0.87 / 1.45)	0 M = .80, SD = 0.15, N =11 1 M = .67, SD = .02, N =3 d = 0.96 (95% CI = -0.39 / 2.27)	0 M = .80, SD = 0.10, N =5 1 M =78, SD = 0.05, N =3 d = 0.22 (95% CI = -1.22 / 1.65)
Stricture Stenosis (0=8, 1=7)	0 M = .81, SD = 0.19, N =8 1 M = .89, SD = 0.07, N =7 d = -0.51 (95% CI = -1.53 / 0.53)	0 M = .75, SD = 0.15, N =7 1 M = .80, SD = 0.14, N =7 d = -0.33 (95% CI = -1.38 / 0.74)	0 M = .80, SD = 0.09, N =3 1 M = .78, SD = 0.06, N =3 d = 0.22 (95% CI = -1.22 / 1.65)
Abscess (0=11, 1=4)	0 M = .83, SD = 0.17, N =11 1 M = .87, SD = 0.03, N =4 d = -0.28 (95% CI = -1.42 / 0.97)	0 M = .76, SD = 0.13, N =10 1 M = .80, SD = 0.18, N =4 d = -0.27 (95% CI = -1.43 / 0.90)	Not enough data to calculate
Dilation (0=11, 1=4)	0 M = .82, SD = 0.16, N =11 1 M = .91, SD = 0.05, N =4 d = -0.65 (95% CI = -1.81 / 0.54	0 M = .77, SD = 0.14, N =10 1 M = .79, SD = 0.17, N =4 = -0.18 (95% CI = -1.33 / 0.99)	Not enough data to calculate
Fistula Formation (0=8, 1=7)	0 M = .82, SD = 0.19, N =8 1 M = .88, SD = 0.07, N =7 d = -0.45 (95% CI = -1.47 / 0.59	0 M = .74, SD = 0.14, N =8 1 M = .82, SD = 0.15, N =6 d = -0.52 (95% CI = -1.58 / 0.57)	Not enough data to calculate
MRE (0=11, 1=4)	0 M = .86, SD = 0.12, N =11 1 M = .81, SD = 0.22, N =4 d = 0.38 (95% CI = -0.79 / 1.52)	0 M = .79, SD = 0.15, N =11 1 M = .71, SD = 0.08, N =3 d = 0.58 (95% CI = -0.73 / 1.87)	Not enough data to calculate
TransabdUS (0=12, 1=3)	0 M = .82, SD = 0.15, N =12 1 M = .96, SD = 0.05, N =3 d = -1.00 (95% CI = -2.31 / 0.33)	0 M = .75, SD = 0.15, N =11 1 M = .88, SD = 0.06, N =3 d = -1.03 (95% CI = -2.35 / 0.33)	Not enough data to calculate

Figure 1

[0839] **Figure 1.** Sensitivity, Specificity, and Accuracy of SICU compared to Other Imaging Modalities including CT, MRE, and transabdominal US

S840

Causes of Mortality Among Hospitalized Patients With Inflammatory Bowel Disease: A Nationwide Analysis

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Introduction: Inflammatory bowel diseases (IBD) are chronic inflammatory disorders of the gastrointestinal tract. Data are limited whether IBD leads to an increased risk of death. This study aims to compare mean ages and causes of death between patients with vs. without IBD.
Methods: A retrospective analysis of 2010-2018 data from the National Readmissions Database (NRD) was performed. We identified IBD patients and all associated diagnoses using ICD-9/10 codes. We compared the mean ages of death, identified the most common causes of mortality, and evaluated risk of death from known IBD-related complications in IBD vs. non-IBD patients. Chi-squared tests with Rao-Scott modification were used to compare the frequencies of specific causes of mortality.
Results: There were 46,545 IBD patients and 6,344,953 non-IBD patients who died. Mean ages of death were 70.0 and 70.4 years, respectively ($p<0.01$). Among all causes of mortality, sepsis was the most common for both groups and was significantly higher in the IBD group (41.9% vs. 28.2%, $p<0.01$) (Figure). The IBD group had significantly greater mortality associated with deep venous thrombosis and pulmonary embolism (DVT/PE) (2.1% vs. 1.6%, $p<0.01$), small bowel obstruction (1.6% vs. 0.8%, $p<0.01$), gastrointestinal infections (4.4% vs. 0.8%, $p<0.01$), *C. difficile* infection (4.0% vs. 0.7%, $p<0.01$), and gastrointestinal bleeding (0.7% vs. 0.5%, $p=0.01$). In addition, IBD patients had higher rates of deaths with colon cancer (0.9% vs. 0.7%, $p<0.01$) and small bowel cancer (0.14% vs. 0.03%, $p<0.01$), however deaths from leukemia, lymphoma, and hepatobiliary cancer were similar between both groups. The death rate was significantly higher in the IBD group in multiple categories of abdominal surgeries, including colectomy (10.9% vs. 1.7%, $p<0.01$), small bowel resection (6.4% vs. 1.5%, $p<0.01$), cholecystectomy (0.9% vs. 0.5%, $p<0.01$), and appendectomy (0.5% vs. 0.1%, $p<0.01$).
Conclusion: The mean age of death in IBD patients was statistically higher; however, the absolute difference was only 5.2 months and thus not clinically significant. Sepsis was the leading identified cause of mortality in the two groups and was significantly higher in the IBD group. Other significant and important causes of death in IBD patients compared with non-IBD patients included *C. difficile* and GI infections, small bowel and colon cancers, and DVT/PE. These data can guide our efforts in preventative care, screening, and practice improvements for our IBD patients.

	IBD Group (per 10,000)	Non-IBD Group (per 10,000)	P-value
Cardiovascular			
MI	343	578	< 0.01
Old MI	43	64	< 0.01
CHF	512	812	< 0.01
CVD	457	839	< 0.01
Infection			
Sepsis	4190	2820	< 0.01
C difficile infection	400	65	< 0.01
GI infection	439	77	< 0.01
Gastrointestinal			
Toxic megacolon	57	52	0.41
Small bowel obstruction	161	78	< 0.01
Liver failure	210	160	< 0.01
Malignancy			
Small bowel cancer	15	1	< 0.01
Colon cancer	93	71	< 0.01
Liver cancer	28	39	0.01
Hepatobiliary cancer	16	11	0.08
Leukemia	6	5	0.78
Lymphoma	41	37	0.38
All malignancies	626	785	< 0.01
Metastatic cancer	295	423	< 0.01
Surgeries			
Small bowel resection	640	153	< 0.01
Colectomy	109	175	< 0.01
Cholecystectomy	91	48	< 0.01
Appendectomy	47	15	< 0.01
Hematologic			
DVT/PE	215	155	< 0.01
GI bleed	67	53	0.01
Other			
COPD	434	486	< 0.01
Accident	928	967	0.11
Decompensated diabetes	158	294	< 0.01

[0840] **Figure 1.** Causes of mortality in patients with and without inflammatory bowel diseases

S841

Biologic Therapy Response Improves Sexual Dysfunction in Patients With Inflammatory Bowel Disease

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Introduction: Patients with IBD have a high degree of sexual dysfunction (SD) which has been correlated with depression, disease activity, and past medication use such as steroids and biologic therapy. We aimed to track SD longitudinally and assess the impact of biologic therapy, using IBD-specific scales.
Methods: Patients with Crohn's disease (CD) and ulcerative colitis (UC) starting a new biologic therapy (anti-TNF, anti-integrin, anti-IL12/23, JAK inhibitor) were surveyed at start of induction therapy and at 6-months. Surveys included the IBD- FSDS and MSDS, PROMIS Brief Sexual Function and Satisfaction Profile, clinical disease activity indices [Harvey-Bradshaw index (HBI), partial Mayo (pMayo) score] and scales that assessed depression [Patient Health Questionnaire-9 (PHQ-9)], and quality of life [Short IBD Questionnaire (SIBDQ)]. Clinical data included inflammatory markers and prior IBD therapies. Therapy response was defined as a reduction in HBI, pMayo, SCCAI ≥3 or total HBI ≤ 4, pMayo < 2, SCCAI ≤2 at 6 months.
Results: 158 patients (86 males and 72 females) completed surveys at induction, and 101 completed at 6 months. The median age was 31 years, 58% had CD, 42% had UC, and 32% were non-white. At induction, the median MSDS score was 5.5 out of 40 (IQR 2-13) and FSDS was 12 out of 60 (3-27; Table). SD correlated with the SIBDQ (r=0.56, p< 0.001), and PHQ-9 (r=0.51, p< 0.001). MSDS and FSDS scores strongly correlated with PROMIS scores (r= 0.70, p< 0.001), and moderately correlated with the HBI (r=0.49, p=0.002), pMayo and SCCAI score (0.44, p=0.02). SD did not correlate with markers of inflammation. MSDS scores significantly improved at 6 months among all participants (p= 0.048). FSDS and PROMIS scores numerically improved among all participants, but did not reach significance. Both MSDS and FSDS scores significantly improved among therapy responders (p=0.004 and p= 0.042, respectively) as did PROMIS scores. Both patients with prior biologic use and biologic naïve patients experienced improvement in sexual function among therapy responders (p=0.02, 0.04).
Conclusion: There was a strong correlation between SD, disease activity, depression, and quality of life indices. Biologic therapy improves sexual function in therapy responders, which is again evidenced in this updated cohort. Despite prior data correlating prior biologic use with SD, our new findings in this longitudinal study show improvement in SD in patients who are both biologic naïve and those with prior use.

Table 1. This Table shows the median sexual dysfunction and clinical disease activity scores stratified by therapeutic response and prior biologic use

	Induction	6 months	p- value (survey 1-3)
All Participants			
MSDS (out of 40)	5.5 (2- 13)	2.5 (0-9)	**0.048***
FSDS (out of 60)	12 (3-27)	9 (3-19)	0.477
PROMIS	31 (20-38)	29.5 (22-35)	0.682
HBI	5 (3-7)	3 (1-6)	**0.003***
pMayo	3 (2-5)	2 (1-4)	0.052
SCCAI	6 (4-8)	4 (3-6)	**0.003***
Therapy responders			
All			
MSDS (out of 40)	5 (1-10)	1 (0-3)	0.004*
FSDS (out of 60)	13 (3-30)	8 (3, 10)	0.042*
PROMIS	32 (26-38)	27 (20-32)	**0.039***
HBI	5 (2-6)	2 (1-3)	< **0.001***
pMayo	4 (2-6)	1 (0-3)	< **0.001***
SCCAI	7 (5-9)	3 (1-4)	< **0.001***
Therapy non-responders			
MSDS	6 (4-16)	8 (3- 12)	0.472
FSDS	12 (8.5-29)	11.5 (3.5- 22)	0.610
PROMIS	34 (2-40.5)	32 (16- 35.5)	0.656
HBI	6 (3-7)	6 (4.5-7.5)	0.285
pMayo	5 (3-6)	4 (1-7)	0.310
SCCAI	6 (5-7)	5 (4-7)	0.441
Biologic naïve			
MSDS	6 (3-14)	2 (0-7)	0.020*
FSDS	12 (3-26)	8 (3-10)	0.089
PROMIS	30 (20-33.5)	26 (2-32)	**0.022***
Prior biologic use			
MSDS	6.5 (3-14)	2 (0.5-0.5)	**0.039***
FSDS	16 (3.5-30)	4 (1.5-14)	**0.044***
PROMIS	30.5 (10-38)	26 (5-35)	**0.045***

Therapy response= Reduction in HBI, pMayo, SCCAI ≥3 or HBI ≤ 4, pMayo < 2, or SCCAI ≤2 at survey 3.
Therapy non-response= Reduction in HBI < 3, pMayo < 3 points or SCCAI < 3.

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Opioid Dependence and Over-Prescription of Opioids in Patients With Co-Existing IBD and IBS

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Introduction: Opioids are commonly prescribed to control pain for patients with inflammatory bowel disease (IBD). However, the wide use of narcotics raised concerns for possible opioid dependence and related mortality. IBD patients with co-existing irritable bowel syndrome (IBS) are more likely to complain about abdominal pain. The goal of the study was to determine the prevalence of opioid prescription and opioid dependence in patients with coexisting IBD and IBS, and to compare with IBD patients without IBS.

Methods: A retrospective cohort analysis was performed using IBM Explorys (1999-2022), which contained deidentified patient information from more than 300 hospitals in the US. We selected patients with a diagnosis with IBD and IBS (IBD+IBS). The control group consist of patients with IBD without IBS (IBD). We collected information regarding opioid prescriptions and diagnosis of opioid dependence. Categorical data was presented as number of patients and percentage. Odd ratios (OR) with 95% confidence interval were used to compare the cohorts.
Results: We identified a total of 38,650 patients with co-existing IBD and IBS and 327,770 patients with IBD without IBS (Table). 83.2% of patients in the IBD+IBS group and 62.6% of patients in the control group have been prescribed opioids (OR [2.87-3.03], p< 0.0001). Opioids were more commonly prescribed in the IBD+IBS cohort including morphine (48.5 vs 29.1%), Hydromorphone (44.7 vs 24.8%), Oxycodone (46.0 vs 27.2%) and Hydrocodone (58.4 vs 35.7%). Opioid dependence was also more common in the IBD+IBS group (4.8% vs 1.6%, OR [2.99-3.33], p< 0.0001).
Conclusion: Patients with overlapping IBD and IBS are prescribed opiates more often than patients with IBD alone, and the former are more likely to be diagnosed with opioid dependence. Appropriate use of therapies approved for IBS, in conjunction with treatment of IBD may help reduce opiate use in this population.

Table 1. Opioid prescription and opioid dependence in patients with IBD+IBS and IBD alone

	IBD+IBS (N=38650)	%	IBD alone (N=327770)	%	OR	95% CI	P
Opioid dependence	1840	4.8%	5110	1.6%	3.16	2.99-3.33	< 0.0001
Opiate	32140	83.2%	205290	62.6%	2.95	2.87-3.03	< 0.0001
Morphine	18760	48.5%	95410	29.1%	2.30	2.25-2.35	< 0.0001
Hydromorphone	17260	44.7%	81420	24.8%	2.44	2.39-2.49	< 0.0001
Oxycodone	17780	46.0%	89210	27.2%	2.28	2.23-2.33	< 0.0001
Hydrocodone	22590	58.4%	117110	35.7%	2.53	2.48-2.59	< 0.0001

S843

Efficacy and Safety of Fecal Microbiota Transplantation in the Treatment of Active Inflammatory Bowel Disease - An Updated Systematic Review and Meta-Analysis of Randomized Controlled Trials

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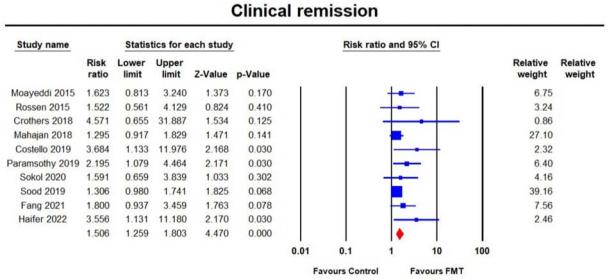
Introduction: In active inflammatory bowel disease (IBD) patients refractory to standard medical therapy, fecal microbiota transplantation (FMT) has shown to be efficacious. The current literature presents compelling evidence for its use. Herein we performed an updated systematic review and meta-analysis to provide a more robust understanding of the effectiveness and safety of FMT on active IBD patients versus placebo.
Methods: We performed a comprehensive literature search on multiple databases in May 2022. Only randomized controlled trials (RCTs) concerning active IBD patients treated with FMT versus placebo were included. Analysis was done using CMA software to compute Odds Ratio, 95% confidence interval. I^2 was used to define heterogeneity. (Figure)
Results: Ten RCTs with the desired study outcomes were included. We had a total of 437 patients in our study in which each patient met a baseline severity of their ulcerative colitis (UC) or Crohn's Disease (CD) based on Mayo Score and Harvey Bradshaw Index respectively. Moreover improvement was standardized by the same scales. Our results are consistent with previous meta-analyses demonstrating reassuring efficacy of FMT in IBD patients when compared to placebo. Clinical (OR 1.506, (95% CI 1.259-1.803), P < 0.0001), endoscopic (OR 2.335, (95% CI 1.577-3.457), P < 0.0001), and histologic (OR 3.764, (95% CI 1.986-7.136), P < 0.001) remission were consistent with the aforementioned. Adverse events (OR 0.745, (95% CI 0.537-1.033), P = 0.077) in FMT patients were also as expected. (Table)
Conclusion: FMT continues to demonstrates superior efficacy when compared to placebo in terms of active IBD treatment. Likewise, its adverse events compared to placebo display no statistical significance; equating to an analogous safety profile. Larger RCTs with longer follow up and more CD patients are necessary to strengthen the validity of FMT as an IBD therapeutic modality.



[0843] **Figure 1.** The clinical remission among active IBD patients treated with FMT versus placebo.

Table 1. Various outcomes of meta-analysis

Outcomes	Number of Studies	OR & 95% CI	P Value (I2)
Clinical Remission	10	1.506 & 1.259-1.803	P < 0.001
Endoscopic Remission	6	2.335 & 1.577-3.457	P < 0.001
Histologic Remission	5	3.764 & 1.986-7.136	P < 0.001
Adverse Events	9	0.745 & 0.537-1.033	P = 0.077

S844

Inpatient Outcomes and Healthcare Utilization in Obese vs Non-Obese Patients Hospitalized with an Acute Ulcerative Colitis Flare - A Nationwide Cohort Study

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Introduction: Ulcerative colitis (UC) remains a leading cause of patient morbidity and in severe cases, mortality. Given the rise in prevalence of obesity in the United States, the goal of this study is to illustrate the impact of obesity in hospitalized patients admitted for acute flares of ulcerative colitis (UC). Our primary outcome was adjusted odds of inpatient mortality. Secondary outcomes included length of hospitalization (LOS), total hospital charge (THC), and complications including sepsis, upper and lower GI bleed (UGIB)(LGIB), and acute kidney injury (AKI).

Methods: The National Inpatient Sample (NIS, 2016-2018) was sourced for hospitalization data from adult patients admitted for UC flares. The queried pool of patients was stratified into obese (BMI ≥ 30), and non-obese cohorts using International Classification of Diseases, Tenth Revision (ICD-10) codes. After performing descriptive analysis on the involved cohorts, linear and multivariate regression was used to evaluate study outcomes. STATA 14 was used for data analysis.
Results: Of 142,094 admissions for UC flare, 12,989 (9.14%) had comorbid obesity. Compared to non-obese-UC patients, obese-UC patients were significantly older (51.2 vs 48.5 years, $p < 0.0001$), were more often female (63.9% vs 53.0%, $p < 0.0001$), had greater Caucasian and African American representation (73.0% vs 71.5%, $p < 0.0001$), (13.8% vs 11.3%, $p < 0.0001$) compared to non-obese patients. Obese-UC patients had more comorbid disease as measured by a Charlson Comorbidity Index score ≥3 (16.4% vs 9.62, $p < 0.0001$), and had more patients belonging to the poorest quartile of family income (27.9% vs 23.9%, $p< 0.0001$). Obese-UC patients as compared to those without obesity had a nonsignificant increase in adjusted odds of inpatient mortality (aOR 1.17; 95% CI 0.67-2.03, p=0.583). Obese-UC had higher rates of complications including LGIB (OR 1.79, $p = 0.017$), Shock (OR 1.48, $p = 0.017$), AKI (OR 1.42, $p = 0.001$). Additionally, Obese-UC patients had an increased LOS (5.48 vs 5.18 days, $p = 0.007$) and higher THC ($54,194 vs $49,957, $p = 0.005$).
Conclusion: Obesity did not significantly increase inpatient mortality. However Obese-UC patients had increased complications (LGIB, Shock, AKI), LOS, and THC relative to UC patients without obesity. Additional studies are needed to further investigate the effects of obesity in UC, and to help reduce the economic burden obesity places on the healthcare system.

S845

Adherence to Human Papillomavirus Vaccination in Inflammatory Bowel Disease Patients in Primary Care Practice

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Introduction: Human Papilloma Virus (HPV) infections are mostly self-limited, however in certain cases the virus replication can become carcinogenic. To prevent cancerous lesions, the HPV vaccine can prevent over 90% of cancers caused by HPV and is recommended by the CDC to be administered by the age of 26 years. Between ages 27 and 45 years patients are still eligible to receive the vaccine with balanced discussion of risks and benefits. According to the current American College of Gastroenterology guidelines, it is recommended that all adult patients with Inflammatory Bowel Disease (IBD), regardless of their immunosuppression status, receive non-living vaccinations which are in-line with national guidelines, including the HPV vaccine.
Methods: A survey was performed assessing knowledge and practices of preventative health in primary care providers, including residents and attending physicians, in the management of patients with IBD. Providers were asked about vaccination practices for their IBD patients. A sample of patients was selected from the medical health record database within a tertiary care center. Inclusion criteria included a confirmed diagnosis of Ulcerative Colitis (UC) or Crohn's Disease (CD) and an established primary care clinic relationship with the internal medicine residents or non-teaching internists of the same medical center. Excluded were patients over the age of 60, due to first approval of HPV vaccine in 2006. General Demographics, HPV vaccination status, and clinical information relating to IBD was collected.
Results: 70% of physicians (38 physicians surveyed) had responded in the survey that female IBD patients should be routinely vaccinated for HPV. A total of 48 patients were included in the study, all of these patients being of female gender. The age of patients ranged from 22 years old to 60 years old. Only 9 out of 48 patients were vaccinated against HPV. 22 patients were on biologic therapy. Of the 22 patients on biologic therapy, 6 patients had completed their HPV vaccination series.
Conclusion: Our survey revealed that more than two-thirds of physicians understood that HPV Vaccination should be a routine vaccination for female patients with IBD. Although 70% of these physicians acknowledged that this population should be vaccinated for HPV, only 18.8% of patients received the vaccine. It would be necessary moving forward to determine the barriers of care, including gaps in physician knowledge, lack of access to the vaccine, patient preference and patient adherence.

S846

Use of Neutrophil-Lymphocyte Ratio and Monocyte-Lymphocyte Ratio as Predictors of Response to Biologics in Patients With Inflammatory Bowel Disease

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Introduction: Various markers, including the leukocyte differentials such as lymphocyte/monocyte ratio (LMR) and neutrophil/lymphocyte ratio (NLR), have been evaluated as surrogates for predictive and prognostic values in inflammatory bowel disease (IBD). Although, previous studies have only evaluated the use of these markers in Ulcerative colitis (UC)patients using anti-TNF medication. Our aim is to assess the association of NLR in predicting clinical response to anti-TNF, anti-integrin, and anti-interleukin 12/23 therapy in patients with UC and Crohn's disease (CD).
Methods: Retrospective analysis of adult patients over the age of 18 years with newly diagnosed IBD necessitating biologic therapy at the Cleveland clinic between 2015 and 2019. Patients with active infections, hematologic, neoplastic disorders, and autoimmune diseases were excluded. Descriptive and logistic regression analyses were performed. Patients with clinical response and continued use of biologics at 52 weeks were deemed responsive to treatment (n=29) and patients whose biologics were discontinued prior to 52 weeks were non-responders (n= 20).
Results: A total of 49 patients were included. The baseline characteristics of the 2 groups are mentioned in Table. Both groups were noted to have a higher percentage of UC patients. Responders were noted to have a similar number of patients on Anti-TNF (48.3%) and non-Anti-TNF (51.7%) medications as opposed to 78.9% of non-responders Anti- TNF. Baseline and follow-up NLR were both higher in the non-responders (4.85 ± 2.91, 3.57 ± 2.68 resp.) when compared to responders (3.64 ± 2.74, 2.70 ± 1.47 resp.). On logistic regression, the need to switch treatment was noted to be statistically significantly related to both initial (OR=1.58 95% CI= 1.07-2.34; p=0.02) and follow-up (OR=2.38 95% CI= 1.07-5.27; p=0.03) NLR when controlled for confounding factors (steroid use, IBD type, and type of biologic).
Conclusion: This is the first study supporting the use of NLR as an inexpensive, non-invasive marker for clinical response in patients with Crohn's disease as well as patients on non-anti-TNF biologics. Our results demonstrate that the absolute NLR at baseline and follow-up is higher for clinical nonresponders requiring a change in therapy. The multivariate analysis shows that NLR predicts the need for change in therapy, independent of the IBD phenotype and the type of biologic used. Further prospective trials are needed to verify these findings in both UC and CD.

Table 1. Baseline Characteristics

Variable	Responders (n=29)	Non-Responders (n=20)	P Value
Age	51.45 ± 13.05	52.42 ± 17.31	0.55
Gender (Female)	51.7%	63.2%	0.43
Race			
Asian	0	5.3%	
Black	0	0	
Caucasian	93.1%	94.7%	
Hispanic	6.9%	0	0.82
Body Mass index	28.99 ± 7.4	26.62 ± 4.93	0.23
Type of IBD			0.16
Ulcerative Colitis	65.5 %	84.2%	
Crohn's disease	34.5%	15.8%	
Type of biologic			0.04
Anti-TNF	48.3%	78.9%	
Vedolizumab/Ustekinumab	51.7%	21.1%	
Initial lymphocyte count	1.71 ± 0.61	1.56 ± 0.95	0.51
Initial Monocyte count	0.66 ± 0.31	0.63 ± 0.30	0.75
Initial Neutrophil count	5.51 ± 3.15	5.66 ± 2.00	0.85

Table 1. (*continued*)

Variable	Responders (n=29)	Non-Responders (n=20)	P Value
Initial NLR	3.64 ± 2.74	4.85 ± 2.91	0.16
Initial LMR	2.86 ± 1.12	2.59 ± 1.22	0.43
Follow up lymphocyte count	1.78 ± 0.58	1.58 ± 0.58	0.26
Follow up monocyte count	0.58 ± 0.20	0.57 ± 0.32	0.85
Follow up Neutrophil count	4.24 ± 1.31	4.47 ± 1.23	0.53
Follow up NLR	2.70 ± 1.47	3.57 ± 2.68	0.17
Follow up LMR	3.33 ± 1.32	3.39 ± 1.65	0.88
Duration of follow up	52 weeks	29.90 ± 12.53 weeks	0.99
Steroid use	58.6%	57.9%	0.96

S847

Oral Manifestations of Inflammatory Bowel Disease: The Temporal Relationship Between Oral and Intestinal Symptoms

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Introduction: Inflammatory Bowel Disease (IBD), including both Crohn's Disease (CD) and Ulcerative Colitis (UC) are chronic relapsing remitting gastrointestinal (GI) disorders that may present with variable symptoms including extraintestinal manifestations (EIMs). The clinical course of EIMs involving the oral cavity can range from asymptomatic to painful, debilitating symptoms and may impact the overall IBD treatment plan. Increased knowledge of the timing and synchronicity of the oral manifestations (OMs) of IBD allows for optimized medical management. We aim to describe our real-world experience of the role of OMs in predicting or accompanying flares of GI inflammation and the impact they may have in the treatment strategy of IBD.
Methods: A retrospective review of electronic medical records at a tri-state tertiary academic medical center for adult patients with IBD from 1/2017 to present who exhibit at least one OM of IBD was performed. Wilcoxon rank sum test for continuous measures and Fisher's Exact test for categorical measures were performed to identify the relationship between development of OMs and IBD flares and the morphology of OMs.
Results: 119 adult IBD patients with OMs included 71 females (59.7%) and 48 males (40.3%) with a median age of 35 (range:18-78) years. Most common OMs identified included aphthous ulcers, mucositis, and stomatitis. Table shows the relationship between active IBD flares and OMs. Based on the results, OMs were significantly synchronous with CD activity in the esophagus (8.5%, p=0.039), gastro-duodenum (10.6%, p=0.017), small intestine (42.6%, p< 0.001) and large intestine (36.2%, p< 0.001). UC pancolitis (17%, p=0.04) was significantly synchronous with OMs.
Conclusion: IBD can be complicated by various EIMs, including a variety of oral diagnoses. This study provides evidence that IBD patients were significantly more likely to have OM flares synchronous with IBD flares. Further analysis will be completed on other factors surrounding OM presentation and management including OMs despite certain IBD treatment.

Table 1.

	OM Flares Synchronous with IBD Flare
CD Esophageal Flare	4 (8.5%), p= 0.039
CD Gastroduodenal Flare	5 (10.6%), p= 0.017
CD Small Intestine Flare	20 (42.6%), p< 0.001
CD Large Intestine Flare	17 (36.2%), p< 0.001
UC Pancolitis Flare	8 (17.0%), p=0.040

S848

Incidence of Pneumonia, Related Hospitalization, and Mortality Among Younger Unvaccinated IBD Patients in a Veteran Affairs Cohort

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Introduction: Community Acquired Pneumonia (CAP) is a serious infection among Inflammatory Bowel Disease (IBD) patients for whose prevention pneumococcal vaccination is recommended. While in the general population vaccination is recommended at age 65, among IBD patients it is recommended at a younger age especially among those exposed to immunosuppressive agents. Our study aimed to determine incidence of CAP, related hospitalization, and mortality among unvaccinated IBD population younger than 65 years and compare the rates between those exposed to immunosuppressive medications and those who were not.
Methods: We conducted a retrospective cohort study utilizing a nationwide cohort of IBD patients who were younger than 65 years of age in the Veterans Affairs Healthcare System (VAHS). Exposure was administration of any immunosuppressive medication for IBD management. Patients were considered exposed on the first date of immunosuppressive medication. For the unexposed group the starting time was the instance of the first 5-ASA medication. The primary outcome was the first occurrence of pneumonia; secondary outcomes being pneumonia related hospitalization and mortality. Patients who had pneumonia confirmed based on CXR findings and individual chart review were included.
Results: Among a total of 26,707 patients, 513 patients developed pneumonia. Mean age in years (SD) was 51.67 (11.34) for the exposed and 45.91 (12.34) for the unexposed group. (Table) The overall crude incidence rate was 3.2 per 1000 patient-years (4.04/1000 patient years in the exposed vs 1.45/1000 patient-years in the unexposed). The crude incidence rates for pneumonia related hospitalization for all the patients, the exposed, and the unexposed were 1.12, 1.44, and 0.44 per 1000 patient-years, respectively. The crude incidence rates for pneumonia-related death for all the patients, the exposed, and the unexposed were 0.09, 0.11, and 0.06 per 1000 patient-years, respectively. In Cox regression, exposed group was associated with an increased risk of pneumonia (AHR 2.85; 95% CI 2.21 – 3.66, p < 0.001) and pneumonia-related-hospitalization (AHR 3.46; 95% CI 2.20 – 5.43, p < 0.001). (Figure)
Conclusion: Among younger unvaccinated IBD patients, incidence as well as the risk of pneumonia and related hospitalization were higher among those exposed to immunosuppressive medications. These findings will help guide physicians and patients to make informed decisions about vaccination.

		Unadjusted analysis		Adjusted analysis	
Outcomes	**Exposure**	**HR (95% CI)**	**P-value**	**HR (95% CI)**	**P-value**
Pneumonia	Unexposed	Reference			
	Exposed	2.79 (2.19 - 3.57)	<0.001	2.85 (2.21 - 3.66)	<0.001
Pneumonia hospitalization	Unexposed	Reference			
	Exposed	3.25 (2.10 - 5.03)	<0.001	3.46 (2.20 - 5.43)	<0.001
Pneumonia-related death	Unexposed	Reference			
	Exposed	1.93 (0.54, 6.82)	0.310	2.81 (0.76, 10.38)	0.121

[0848] **Figure 1.** Effect of intake/administration of any immunosuppressive medication(s) on incidence of pneumonia

Table 1. Characteristics and outcome of patients by exposure

	Exposed (N = 17727)	Not exposed (N = 8980)	P-value
Age (mean ± SD)	51.67 ± 11.34	45.91 ± 12.34	< 0.001
Gender			
Male	15625 (88)	8262 (92)	< 0.001
Female	2102 (12)	718 (8)	
Race			
White	13987 (79)	7294 (81)	< 0.001
Black	2492 (14)	939 (10)	
Other	389 (2)	202 (2)	
Unknown	859 (5)	545 (6)	
Geographic locations			
Continental	2972 (17)	1387 (15)	< 0.001
Midwest	3901 (22)	2059 (23)	
North Atlantic	4101 (23)	2330 (26)	
Pacific	3257 (18)	1550 (17)	
Southeast	3496 (20)	1654 (18)	
IBD type			
CD	8563 (48)	2831 (32)	< 0.001
UC	9164 (52)	6149 (68)	
CCI (mean ± SD)	0.49 ± 1.06	0.52 ± 1.17	0.129
Smoking status			
Yes	7247 (41)	4260 (47)	< 0.001
No	10480 (59)	4720 (53)	
Chronic Pulmonary Disease			
Yes	1785 (10)	554 (6)	< 0.001
No	15942 (90)	8426 (94)	

S849

Malignancies in Inflammatory Bowel Disease Patients – A Population-Based Study of the Last Two Decades

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Introduction: Inflammatory Bowel Disease (IBD) is a chronic inflammatory disorder of the gut with prevalence estimated to be more than 3 million in the USA. Many studies suggest that IBD patients have an increased risk of developing intestinal and extraintestinal malignancies. It is suspected, IBD-related inflammation and carcinogenic properties of immunosuppressive drugs are main culprits of initiation and progression of tumor formation. This study aimed to analyze the nationwide prevalence of malignant neoplasms in IBD patients.
Methods: NIS database was queried from January 2000 to December 2019 to retrieve records of patients admitted with a principal or secondary diagnosis of IBD. We compared the incidence of malignant neoplasms in IBD (cases) based on ICD codes to patients who did not have IBD (controls). Controls were 1:1 fixed ratio nearest neighbor (greedy) propensity score-matched using the patient's age, sex, and race. We performed univariate logistic regression to calculate the odds ratio. Statistical analysis is performed in R (Studio 1.4). The p-values of < 0.01 were considered to be significant.
Results: A total of 1,109,008 records were identified with IBD. IBD patients have increased risk of some cancers including small intestine (OR, 4.40; 99% CI, 3.69 – 5.25; $p < 0.001$), bile duct (OR, 3.97; 99% CI, 3.32 – 4.74; $p < 0.001$), myelodysplastic syndrome (OR, 1.66; 99% CI, 1.52 – 1.81; $p < 0.001$, anorectal (OR, 1.64; 99% CI, 1.55 – 1.73; $p < 0.001$), skin (OR, 1.62; 99% CI, 1.57 – 1.68; $p < 0.001$),

colorectal (OR, 1.29; 99% CI, 1.25 – 1.33; $p < 0.001$), urinary (OR, 1.09; 99% CI, 1.05 – 1.13; $p < 0.001$),and prostate (OR, 1.13; 99% CI, 1.10 – 1.17; $p < 0.001$). IBD patients are at low risk of head and neck, esophagus, stomach, respiratory, bone, breast, nervous system, myeloma, ovary, testis, and pancreas (Table).

Conclusion: IBD and malignancies have been discussed in the past. Despite these efforts, much remains unknown regarding the increased risk of cancers in IBD. Our results showed that IBD patients are at an increased risk of certain neoplasms, specifically small bowel, bile duct, and myelodysplastic syndrome. Although inflammatory injury and immunosuppression can play a role in carcinogenesis, we still know little about the risk factors contributing to neoplasms. Therefore, more studies are needed to determine the risk factor and mechanism for developing malignancies in IBD patients. It is essential to emphasize age-appropriate cancer screening in our IBD patients.

Table 1. Prevalence of malignant Neoplasms in IBD vs. age-, sex-, and race-matched non-IBD patients National Inpatient Sample 2000 - 2019

Variables	IBD = No (n= 1,108,914) 50%	IBD = Yes (n= 1,109,008) 50%	OR (99%CI)	*P* value
Head and Neck	3413 (0.31%)	2186 (0.06%)	0.64 (0.60– 0.69)	< .0001
Esophagus	1314 (0.12%)	714 (0.06%)	0.54 (0.48 – 0.59)	< .0001
Stomach	1450 (0.13%)	1146 (0.10%)	0.79 (0.71– 0.87)	< .0001
Small Intestine	264 (0.02%)	1161 (0.10%)	4.40 (3.69– 5.25)	< .0001
Colorectal	11758 (1.06%)	15163 (1.37%)	1.29 (1.25– 1.33)	< .0001
Liver	1379 (0.12%)	1472 (0.13%)	NA	0.0818
Bile Duct	265 (0.02%)	1052 (0.09%)	3.97 (3.32 – 4.74)	< .0001
Respiratory	15699 (1.42 %)	10791 (0.97 %)	0.68 (0.66– 0.71)	< .0001
Bone	1666 (0.15%)	694 (0.06%)	0.41 (0.37 – 0.47)	< .0001
Skin	8554 (0.77%)	13797 (1.24%)	1.62 (1.57 – 1.68)	< .0001
Breast	21129 (1.91%)	17994 (1.62%)	0.85 (0.83– 0.87)	< .0001
Urinary	9092 (0.82%)	9913 (0.89%)	1.09 (1.05 – 1.13)	< .0001
Nervous System	2135 (0.19%)	1277 (0.12%)	0.60 (0.55 – 0.65)	< .0001
Lymphoma	8311 (0.75%)	8110 (0.73%)	NA	0.1141
Leukemia	6174 (0.56%)	6142 (0.55%)	NA	0.7689
Myeloma	2314 (0.21%)	1890 (0.17%)	0.82 (0.75– 0.88)	< .0001
Myelodysplastic Syndrome	1394 (0.13%)	2316 (0.21%)	1.66 (1.52– 1.81)	< .0001
Anorectal	3716 (0.34%)	6074 (0.55%)	1.64 (1.55– 1.73)	< .0001
Uterus	3433 (0.31%)	3236 (0.29%)	NA	0.0155
Cervix	3849 (0.35%)	3818 (0.34%)	NA	0.7201
Ovary	3276 (0.30%)	2577 (0.23%)	0.79 (0.74– 0.84)	< .0001
Prostate	12489 (1.13 %)	14109 (1.27 %)	1.13 (1.10– 1.17)	< .0001
Testis	1073 (0.10%)	787 (0.07%)	0.73 (0.65 – 0.83)	< .0001
Thyroid	2472 (0.22%)	2650 (0.24%)	NA	0.0129
Pancreas	2259 (0.20%)	1880 (0.17%)	0.83 (0.76– 0.90)	< .0001
Neuroendocrine Tumors	536 (0.11%)	618 (0.06%)	NA	0.0158

S850

Obesity as Defined by Body Mass Index Is Not a Risk Factor for Post-Operative Recurrence in Crohn's Disease

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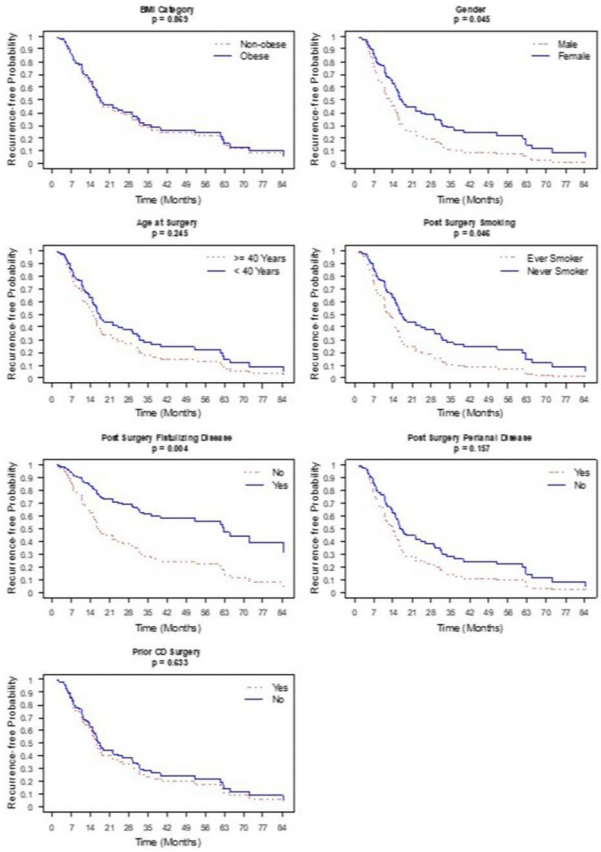
Introduction: Obesity is a global epidemic and a condition which can lead to development of chronic illnesses such as diabetes, cardiovascular disease, and cancer, and has also been proposed as a risk factor for development and complications of inflammatory bowel diseases (IBD) such as Crohn's disease (CD) and ulcerative colitis. In patients with CD, more than 70% require surgery due to stricturing and/or penetrating complications, and the risk for endoscopic recurrence within five years is as high as 60-90%. Obesity has not been studied extensively as a risk factor for postoperative recurrence (POR) of CD. We hypothesized that obesity as defined by BMI is a risk factor for POR.

Methods: A retrospective study was performed at a university medical center following Institutional Review Board approval, and patients who had undergone CD-related surgery from January 2008 to July 2018 were included. Patients initiated on biologic therapy postoperatively were excluded. Data on patient demographics and covariates were collected, and the presence and timing of endoscopic, surgical, and/or radiographic recurrence were recorded. A Cox proportional hazard (PH) model was fitted to model the risk of POR of CD in obese patients, controlling for patient characteristics and risk factors.

Results: A total of 82 patients were included in the analysis, one-fifth of whom were obese (n=18, 22%). Obesity as defined by a BMI ≥ 30 was not an independent risk factor for the development of POR in either the unadjusted or the adjusted model. Among the other examined variables, the risk of POR among males was 70% higher than in females (HR=1.70, 95% CI: 1.01, 2.86). Patients who smoked after surgery had a significantly higher risk of POR as compared to non-smokers (HR=1.74, 95% CI: 1.01, 3.01), while the presence of prior/current fistulizing disease reduced the recurrence of CD risk by more than 60% (HR=0.39, 95% CI: 0.20, 0.73). Cox PH models using BMI either as a continuous or categorical variable yielded similar results. (Table, Figure)

Conclusion: Obesity as defined by BMI was not predictive of POR risk in our study, which may have been limited due to sample size and proportion of obese patients. The need to explore other measures of obesity in CD still exists, as identification of modifiable risk factors may help to prevent POR. Other measures of adiposity such as visceral fat area, visceral adipose tissue (VAT) and the ratio of VAT to total body fat mass have shown promise in predicting obesity-associated risks in the IBD population.



[0850] **Figure 1.** Six-year postoperative adjusted recurrence-free probabilities for each variable in the model.

Table 1. Hazard Ratios (HR) and Their 95% Confidence Intervals for Obesity, Demographic Characteristics and Covariates for Postoperative Recurrence Using Cox Proportional Hazard Modeling

Characteristics	Unadjusted HR (95% CI)	Adjusted HR (95% CI)
BMI Category		
Non-obese	1.00	1.00
Obese	1.28 (0.72, 2.27)	0.94 (0.49, 1.82)
Gender		
Female		1.00
Male		**1.70 (1.01, 2.86)**
Age at Surgery		
< 40 Years		1.00
≥ 40 Years		1.35 (0.81, 2.25)
Post-Surgery Smoking		
Non-smoker		1.00
Smoker		**1.74 (1.01, 3.01)**
Fistulizing Disease		
No		1.00
Yes		**0.39 (0.20, 0.73)**
Perianal Disease		
No		1.00
Yes		1.55 (0.84, 2.85)
Prior Crohn's Disease Surgery		
No		1.00
Yes		1.14 (0.67, 1.92)

S851

Role of Tofacitinib as an Adjunct to Intravenous Corticosteroids in the Management of Acute Severe Ulcerative Colitis: An Interim Analysis

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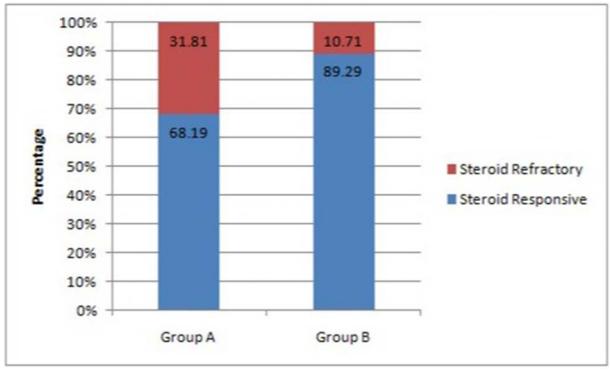
Introduction: Acute Severe Ulcerative Colitis (ASUC) is a medical emergency and a potentially life-threatening condition requiring hospitalization. Intravenous steroids are the mainstay of therapy, but 30–40% of patients will fail to respond to steroids and require progression to rescue therapy. The current study aimed to evaluate the role of tofacitinib in reducing steroid refractoriness when used as an adjunct to intravenous corticosteroids.
Methods: This is an open-label, parallel-group study performed at a tertiary care centre in India between January 2021 and April 2022. After taking informed consent, patients with ASUC, defined on the basis of Truelove Witts criteria, were enrolled and subjected to either intravenous hydrocortisone (100 mg 6 hourly) (group A) or intravenous hydrocortisone (100 mg 6 hourly) plus tofacitinib (10 mg thrice daily) (group B). Steroid responsiveness was defined using Oxford's criteria on day 5. The rates of steroid refractoriness were compared between the two groups
Results: A total of 50 patients (mean age 38.92±14.32 Years, 46% males) were included during the study period. 22 patients (mean age 39±13.87 Years, 54.55% males) and 28 patients (mean age 38.85±14.92 Years, 39.29% males) were enrolled in groups A and B, respectively. Seven (31.81%) patients in group A and three (10.71%) patients in group B were steroid-refractory at day 5 (p=0.06; Figure). Mean C-reactive protein on day 5 was 15.83 ± 22.68 and 9.39 ± 8.5 in groups A and B, respectively (p=0.62).
Conclusion: The use of tofacitinib as an adjunct to intravenous corticosteroids did not result in lower rates of steroid refractoriness in patients with ASUC. Larger randomized studies are however needed to establish the role of tofacitinib in patients with ASUC.



[0851] **Figure 1.** Comparison of Steroid responsiveness between two groups on the basis of Oxford Criteria

S852

Switch Biologics or Pursue Surgery? Optimizing Clinical Decision Making in the Treatment of Inflammatory Bowel Diseases

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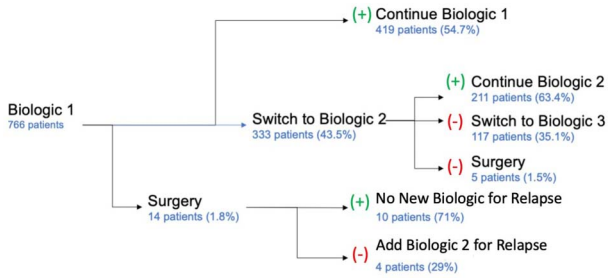
Introduction: Biologics have transformed inflammatory bowel disease (IBD) treatment and decreased the need for surgery. However, many patients fail their first biologic and require alternative agents. With each failure, patients face the decision to switch biologics or pursue surgery. Our aims were to (1) evaluate outcomes of switching biologics or pursuing surgery in patients who fail their first biologic and (2) identify factors that influence these outcomes.
Methods: We performed a chart review of IBD patients who initiated a biologic at a tertiary center between 2015-2021. Demographics, disease characteristics, and treatment course were abstracted. Pathways following biologic initiation included (1) maintenance of first biologic, (2) switch to alternate biologic, or (3) surgery. For those who switched biologics or pursued surgery, an outcome was defined as "positive" (not requiring new biologic) or "negative" (requiring new biologic or surgery) by the last follow-up. Proportion and time-to-event analyses were evaluated. Multivariable Cox regression was used to estimate risk of a "negative" outcome based on demographics, disease duration, location, and behavior.
Results: We identified 766 patients who required a biologic with a mean follow-up time of 5.6 years (±4.2). Once initiated on a biologic, the likelihood of continuing the same biologic, switching agents, or requiring surgery were 54.7%, 43.5%, and 1.8%, respectively (Figure). Most patients who switched biologics or underwent surgery after their first biologic ultimately had a "positive" outcome, comparable to the initial biologic (log rank P = 0.82). In patients with Crohn's disease (CD) who switched biologics rather than undergo surgery, stricturing disease (hazard ratio [HR] 3.44, 95% CI 1.56-7.57) and upper gastrointestinal (GI) involvement (HR 9.98, 95% CI 2.35-42.37) correlated with a "negative" outcome. For patients with ulcerative colitis, non-white race (HR 1.34, 95% CI 1.06-1.68) correlated with a "negative" outcome.
Conclusion: Half of patients had durable control of disease with their first biologic. For those who failed their first biologic, most switched to a second biologic with a positive outcome, while a minority required surgery. CD stenosis, upper GI involvement, and race were risk factors for treatment failure in patients who switched biologics instead of undergoing surgery. Further investigation is needed to clarify factors that influence medical vs. surgical therapy in patients who fail their first biologic.



[0852] **Figure 1.** Flow chart outlining the course of treatment for patients with IBD who required initiation of a biologic agent

S853

Factors Affecting Pouchoscopy Bowel Preparation in Patients With an Ileal Pouch Anal Anastomosis

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Introduction: Inadequate bowel preparation (prep) limits visualization and can results in the need for repeat endoscopy. There is no standard recommended bowel prep prior to pouchoscopy. We hypothesized that many patients with history of ileal pouch anal anastomosis (IPAA) undergoing pouchoscopy have inadequate prep. We hope that further analysis of patients with, and without, adequate prep will lead to insights informing the development of a standardize prep.
Methods: This was a retrospective review of adult patients with inflammatory bowel disease (IBD) or polyposis syndromes (PS) who underwent pouchoscopy at a tertiary referral center between June 2020-March 2022. Patient demographics, clinical characteristics, oral intake prior to pouchoscopy, recommended bowel prep, and endoscopic bowel prep were abstracted. Inadequate bowel prep was defined as "poor" or "fair" and adequate bowel prep was defined as "adequate", "good" or "excellent" as described by the endoscopist. If the quality of the bowel prep was not described, two independent reviewers performed endoscopic photo review (DF, JK). Pouch age was defined as the time from pouch creation to time of pouchoscopy. χ^2 test was used for comparative statistical analysis, a p value < 0.05 was defined as statistically significant.
Results: Fifty-six patients underwent 89 pouchoscopy evaluations, 27/56 (48%) were female. IPAA was indicated for IBD in 47 patients [43 ulcerative colitis, 4 Crohn's disease] and 9 patients with PS. Median age at time of procedure was 43y (range 18-71y), median pouch age was 8y (range 0-36y). Twenty patients (22%) were noted to have inadequate bowel prep compared to 69 (78%) with adequate bowel prep. Table compares these two groups. 17/17 (100%) of procedures done in patients with PS indication had adequate bowel prep compared to 52/72 (72%) in patients who underwent IPAA due to IBD (p=0.014). Other variables were not statistically significant. However, inadequate bowel prep was common with enema prep (9/21) and rare with large volume preps (1/15). Most PS patient used large volume prep.
Conclusion: About 1 in 5 of patients with IPAA had inadequate bowel prep, all with a history of IBD. Inadequate bowel was uncommon with a large volume prep and consideration should be given to large volume prep being standard of care. Inadequate prep did not occur in PS patients, perhaps as large volume prep was commonly used by this group.

Table 1. Comparison between patients with inadequate bowel prep and appropriate bowel prep according to clinical and endoscopic characteristics

Total = 89	Inadequate bowel prep (20)	Adequate bowel prep (69)	p value
Indication for IPAA			
IBD (72)	20	52	0.014
Polyposis syndromes (17)	0	17	
Sex			
Female (46)	12	34	0.398
Male (43)	8	35	
Pouch age at time of procedure			
< 5 years (21)	5	16	0.981
5-10 years (28)	6	22	
>10 years (40)	9	31	
Oral intake 24 hour prior procedure			
Clear liquid diet (32)	5	27	0.246
Full meal (57)	15	42	
Bowel prep			
Large volume oral bowel prep (16)	1	15	0.408
Low volume oral bowel prep (11)	5	13	
Low volume oral prep and enema prep (16)	4	12	
Enema prep only (30)	9	21	
No bowel prep (8)	1	7	
Large volume prep given			
Yes	1	15	0.086
No	19	54	
Large/low volume oral bowel prep completeness			
Complete bowel prep (100% intake) (31)	5	26	0.455
Incomplete bowel prep (3)	1	2	
Procedure timing			
Morning (60)	11	49	0.178
Afternoon (29)	9	20	
Presence of distal pouch stricture			
Yes (20)	3	17	0.363
No (69)	17	52	

Large volume bowel prep = Golytely, Miralax. Low volume bowel prep: Moviprep, Clenpiq, Suprep, magnesium citrate. Enema therapy = tap water or fleet enema.

S854

Inflammatory Bowel Disease Patients With Reported Penicillin Allergies Are at Increased Risk of Infections and Hospital Visits

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Introduction: Allergies to penicillin-based antibiotics are charted for up to 10% of the population, though it is estimated that up to 90% of these *reported* allergies may not be *true* allergies. The label of penicillin allergy (PCN-A) has been linked to an increased risk of MRSA and C difficile infection (CDI) in the general population in part due to alternative antibiotic selection. Patients with inflammatory bowel disease (IBD) are noted to have higher rates of CDI as well. The goal of this project was to assess infection and hospitalization risk in IBD patients with PCN-A.
Methods: The multi-institutional, health research network TriNetX (Cambridge, MA, USA) was queried using ICD10 codes to obtain clinical data on patients with a diagnosis of PCN-A and IBD between 2002 and 2022. Variables of interest were queried. Propensity matching was used to compare groups, and ulcerative colitis (UC) and Crohn's disease (CD) were analyzed separately.
Results: 7,536 patients with UC and PCN-A were identified and matched to those without PCN-A based on age, sex, race, glucocorticoid use, and proton pump inhibitor use. Similarly, 8,699 patients with CD and PCN-A were matched with a non PCN-A cohort based on similar characteristics (Table). Both UC and CD patients with PCN-A had a significantly increased risk of developing CDI compared to those without PCN-A (OR=1.51, p< 0.0001; OR=1.53, p< 0.0001 respectively) as well as MRSA infection (OR=1.81, p< 0.0001; OR=1.76, p< 0.0001 respectively; Figure). There was no increased risk of having intestinal surgery in either UC or CD patients with PCN-A. PCN-A status did not alter risk of needing biologic therapy for UC patients (OR=1.0, p=0.87) but decreased likelihood for CD patients compared to non-PCN-A (OR=0.90, p=0.01). Both UC and CD patients with PCN-A had an increased risk of ER visits (OR=1.38, p< 0.0001; OR=1.47, p< 0.0001 respectively) and hospital admission (OR=1.40, p< 0.0001; OR=1.45, p< 0.0001 respectively).
Conclusion: Patients with IBD and reported PCN-A have an increased risk for CDI and MRSA. These patients also had an increased risk of ER visits and admission; however, they were not more likely to require intestinal surgery. CD patients with PCN-A were less likely to receive biologic therapy. More studies are needed to explore the role of PCN-A label on outcomes in IBD patients. These patients should be considered for allergy testing as it may independently increase risk for infections.

Figure 1: Outcomes for ulcerative colitis patients and Crohn's disease with penicillin (PCN) allergy (No PCN allergy is reference)

	Ulcerative Colitis			Crohn's Disease		
Outcomes	Odds Ratio	95% CI	p	Odds Ratio	95% CI	p
CDI	1.51	(1.37,1.66)	p<0.0001	1.53	(1.38,1.69)	p<0.0001
MRSA infection	1.81	(1.34, 2.46)	p<0.0001	1.76	(1.38,2.2)	p<0.0001
GI Surgery[a]	1.19	(0.93,1.52)	p=0.17	0.92	(0.77,1.09)	p=0.33
Biologic Therapy[b]	1.0	(0.89,1.14)	p=0.87	0.90	(0.83,0.98)	p=0.01
ER Visits	1.38	(1.28,1.47)	p<0.0001	1.47	(1.38,1.57)	p<0.0001
Admissions	1.40	(1.31,1.50)	p<0.0001	1.45	(1.36,1.54)	p<0.0001

CDI: *C difficile* infection
MRSA: Methicillin-resistant Staphylococcus aureus infection
[a]Colectomy for ulcerative colitis and colectomy or small bowel surgery for Crohn's disease
[b]For UC patients: infliximab, ustekinumab, tofacitinib, upadacitinib, adalimumab, golimumab, vedolizumab, ozanimod
For CD patients: infliximab, ustekinumab, adalimumab, certolizumab, natalizumab, vedolizumab

[0854] **Figure 1.** Outcomes for ulcerative colitis patients and Crohn's disease with penicillin (PCN) allergy (No PCN allergy is reference).

Table 1. Propensity score matching results for ulcerative colitis patients and Crohn's disease with and without penicillin (PCN) allergy

Category	Ulcerative Colitis			Crohn's Disease		
	PCN allergy	No allergy	p value	PCN allergy	No allergy	p value
n	7536	7536	-	8699	8699	-
Age (y ± SD)	61.3 ± 18.6	61.4 ± 18.5	0.76	53.7 ± 19.5	53.8 ± 19.6	0.67
Female (%)	66.1	66.1	0.90	68.4	68.3	0.83
White (%)	77.3	77.6	0.71	77.3	77.7	0.51
Black (%)	9.5	9.5	0.91	10.5	10.2	0.47
Asian (%)	0.7	1.7	< 0.0001	0.6	1.2	< 0.0001
Steroid Use (%)	50.7	50.8	0.88	48.1	48.2	0.92
Proton pump inhibitor Use (%)	64.2	64.4	0.85	60.8	60.7	0.84

S855

Inflammatory Bowel Disease in Sub-Saharan Africa Setting: Experience From a Large Tertiary Center in Ethiopia

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Introduction: Inflammatory bowel diseases (IBD) include ulcerative colitis (UC) and Crohn's disease (CD). Anecdotal evidence indicates there is an increment in the prevalence of the condition in the sub-Saharan Africa region. This region is projected to account for half of the world's population growth over the next 30 years according to the United Nations.
Methods: A cross-sectional study was conducted on patients having a follow-up with a diagnosis of IBD at the largest hospital in Ethiopia over one year. Data on sociodemographic, clinical parameters, initial therapy type, clinical course, and surgical interventions were assessed. Data was gathered through a review of medical records and patient interviews, and a standardized questionnaire was applied. The collected data was analyzed using SPSS v. 26.
Results: A total of 102 IBD patients (29 UC, 73 CD and a ratio of 2.5:1) with female predominance, 57% (n = 58) were identified. The M-to-F ratio was 1:1.2 for CD and 1:1.6 for UC. The mean age at diagnosis was 26.4 years for CD and 33 years for UC. Only 5.9% of patients had a family history of IBD, and no association between smoking with IBD was found. EIMs were reported in 16.6%. In patients with CD, the ileo-colon type was the most common disease phenotype (38%), the inflammatory type was the most common disease behavior (49.3%); and 18.6% of patients had a history of bowel resection. In patients with UC, left-sided colitis was the predominant disease extent (69.0%). The majority of the patients were on steroids and immunomodulators. Statistically significant difference was seen between UC & CD in the age of onset, family history of the disease, and anti-TB drug use. (Table)
Conclusion: The present study reported the largest number of patients in the sub-Saharan Africa region with IBD. CD was the commonest IBD type in the Ethiopian context, unlike other developing countries. Improvement in diagnostic services as well as changing lifestyle patterns could lead to an increment in the diagnosis of the condition in the continent.

Table 1. Clinical Characteristics of IBD Patients

Characteristics	UC (N=29)	Type of IBD		*P* value
		CD (N=73)	Total (N=102)	
Age of diagnosis (years), n (%)	Adolescence (< 19)	0	10 (13.7)	10 (9.8)	**0.003**
	Young Adults (19–35)	20 (69)	57 (78)	77 (75.5)	0.02
	Middle –Aged Adults (36–55)	9 (31)	6 (8.3)	15 (14.7)	0.02
	Older Adults (> 55	0	0	0	

Table 1. (*continued*)

Characteristics	UC (N=29)	Type of IBD			*P* value
			CD (N=73)	Total (N=102)	
Mean age at diagnosis (years) (±SD)		33 ± 11.2	26.4 ± 9.8	28.3 ± 10.6	0.04
Duration of disease (Years), n (%)	Short (< 5 years) Long (5-10 years) (> 10 years)	21(72.4) 7(24.1) 1(3.4)	60(82.1) 10(13.6) 3(4.1)	81(79.4) 17(16.7) 4(3.9)	0.33
Interval between symptom onset and diagnosis (in months), n (%)	1-5 months 6-10 months 11-15 months > 20 months Couldn't inform/be retrieved	7(24.1) 4(13.7) 1(3.4) 5(17.2) 12(41.3)	11(15) 13(17.8) 12(16.3) 12(16.3) 25(34.2)	18(17.6) 17(16.7) 13(12.7) 17(16.7) 37(36.2)	0.400
Abdominal pain, n (%)		21(72.4)	60(82.1)	81(79.4)	0.3
Chronic diarrhea without blood, n (%)		6(20.6)	46(63)	52(50.9)	**0.001**
Bloody diarrhea/exclusive rectal bleeding, n (%)		23(79.3)	8(10.9)	31(30.3)	**< 0.001**
Mucoid stool, n (%)		7(24.1)	13(17.8)	20(19.6)	0.4
Weight loss, n (%)		15(51.7)	42(57.5)	57(55.8)	0.5
UGI symptoms*, n (%)		2(6.8)	21(28.7)	23(22.5)	**0.03**
Peri anal symptoms, n (%)	Draining Fistula Anorectal pain Fecal urgency/incontinence	0 1(3.4) 1(3.4)	9 (12.3) 1(1.3) 1(1.3)	NA 2(1.9) 2(1.9)	**0.03**
Perianal disease in CD, n (%)			11 (15.1)		
EIM, n (%)	Total Type of EIM	8(27.5)	9(12.3) Joint (16), 1 (pyoderma gangrenosum)	17(16.6)	0.2

S856

Predictors of Colectomy in Acute Severe Ulcerative Colitis

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Introduction: Up to 30% of patients admitted with acute severe ulcerative colitis (UC) will require a colectomy despite advances in medical therapies. Our aim was to assess the risk factors for colectomy in patients hospitalized with acute severe ulcerative colitis using initial admission data.
Methods: This is a single-center, retrospective study of all patients hospitalized with acute severe UC from 1/1/2012-11/1/2021. Patients who underwent colectomy (during the admission or after discharge) were compared with patients who did not have a colectomy. Continuous variables were analyzed using an unpaired student's t-test. Categorical variables were analyzed using a Pearson's chi-square test. Variables with $p< 0.05$ on univariate analysis were identified and incorporated as independent variables in a multivariate regression model.
Results: A total of 168 patients hospitalized with acute severe UC were included (52.4% were male; mean age was 39.8 ±17.2 years). The median disease duration was 2.5 years (IQR 1-10) and 64.9% (n=109) of the cohort were biologic naïve. A total of 31 patients (18.5%) required a colectomy. On univariate analysis, the following factors were associated with a higher risk of colectomy: female sex (70.9% vs 42.3%, p=0.004), lower hemoglobin (10.5 vs 12 g/dL, p=0.002), lower albumin level (3.2 vs 3.5 g/dL, p=0.015). Patients who were on oral corticosteroids on admission had a higher risk of colectomy (70.9% vs 48.9%, p=0.02) while patients who were biologic naïve had a lower risk of colectomy (41.9% vs 70.1%, p=0.003). C-reactive protein level on admission was not associated with risk of colectomy (Table). A multivariate logistic regression model comprising the above variables showed that female sex (p=0.019) and lower hemoglobin (p=0.048) were independently associated with an increased risk of colectomy.
Conclusion: In our cohort, approximately one fifth of patients with acute severe UC required a colectomy. Female sex and lower hemoglobin on admission were independently associated with a higher risk of colectomy while biologic naïve patients had a lower risk of colecomy. Further studies to assess if earlier treatment could further lower colectomy rates are needed.

Table 1. **Baseline Characteristics**

Variables	Colectomy (n=31)	No colectomy (n=137)	p-value
Patient characteristics			
Age, mean (SD)	40.5 (19.7)	39.6 (16.7)	0.82
Female, n (%)	22 (70.9)	58 (42.3)	**0.004**
Disease activity			
Pancolitis, n (%)	20 (64.5)	97 (70.8)	0.75
Disease duration in years, mean (SD)	6.3 (7.9)	6.9 (9.4)	0.71
Presence of extraintestinal manifestations, n (%)	1 (3.2)	12 (8.8)	0.29
Smoking, n (%)	2 (6.5)	7 (5.1)	0.58
Concomitant CMV infection, n (%)	2 (6.5)	1 (0.7)	0.08
Concomitant C. difficile infection, n (%)	1 (3.2)	8 (5.8)	0.56
Labs at presentation			
Hemoglobin g/dL, mean (SD)	10.5 (2.2)	12.0 (2.6)	**0.002**
C-reactive protein md/dL, mean (SD)	85.7 (61.2)	80.4 (84.9)	0.73
Albumin g/dL, mean (SD)	3.2 (0.7)	3.5 (0.6)	**0.015**
Medications			
Biologic naïve, n (%)	13 (41.9)	96 (70.1)	**0.003**
Inpatient infliximab rescue, n (%)	16 (51.6)	51 (37.2)	0.14
On oral corticosteroid at time of admission, n (%)	22 (70.9)	67 (48.9)	**0.026**

Table 1. (*continued*)

Variables	Colectomy (n=31)	No colectomy (n=137)	p-value
Statins on admission, n (%)	4 (12.9)	9 (6.6)	0.44
Chronic outpatient opioid use, n (%)	3 (9.7)	10 (7.3)	0.65
Inpatient opioid, n (%)	17 (54.8)	72 (52.6)	0.82
On IMM on admission, n (%)	1 (3.2)	13 (9.5)	0.25

SD: standard deviation; CMV: cytomegalovirus; C. difficile: Clostridiodes difficile; IMM: immunomodulator.

S857

Diversity of the Fungal Mycobiome Across Endo-Histologic Activity and Treatment-Associated Effects in Ulcerative Colitis

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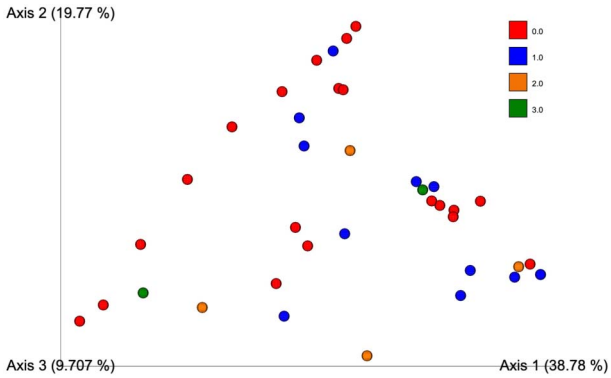
Introduction: Fungi represent a highly immunologically reactive component of the gut microbiota, however their dynamics during varying stages of inflammation and treatment in ulcerative colitis (UC) remain poorly understood. A recent study of fecal microbial transplantation in UC demonstrated that fungal diversity may be associated with progression to remission in the recipient. We aimed to characterize the diversity of the mycobiome in UC across the spectrum of endo-histologic activity alongside treatment-mediated effects.
Methods: We performed a retrospective cohort study, utilizing data from The Study of a Prospective Adult Research Cohort with IBD, established by the Crohn's and Colitis Foundation. This national cohort includes clinical metadata, endoscopic scores, digitized histologic sections, medication use, and stool metagenomics. Internal Transcribed Spacer based deep sequencing of fungal rDNA from fecal samples was analyzed using Quantitative Insights Into Microbial Ecology 2. Alpha and beta diversity (measured using faith phylogenic diversity or unweighted Unifrac) was compared among (1) patients with complete endoscopic remission vs endoscopic activity, (2) patients with endo-histologic remission vs endo-histologic activity, and (3) patients naïve to biologic medications vs patients actively treated with biologic medications. (Figure)
Results: Among 85 samples with fungal sequencing data, endoscopic data (defined by Mayo endoscopic score [MES]) was available for 32 samples. Histologic classification (defined by Nancy histologic index [NHI]) was prospectively analyzed among 31 samples. Patients with endoscopic remission (MES 0, n=20) had no difference in alpha diversity (3.22 v 3.06, p=0.938, H=0.0379) compared to any endoscopic activity (MES >0, n=12). No difference in beta diversity was observed (p=0.301). No difference in alpha diversity was observed between patients on (n=43) or off (n=15) biologics (3.44 v 3.21, p=0.411, H=0.676). Alpha diversity was similar between endo-histologic activity (n=13) and endo-histologic remission (n=18), (3.22 v 2.97, p=0.378, H=0.776), alongside similar beta diversity (p=0.781).
Conclusion: Fungal diversity indices were similar in UC patients across the spectrum of endo-histologic activity and treatment effect. Future analyses should examine these indices in larger cohorts of patients as well as evaluate differences in abundance of fungal species across the spectrum of endo-histologic activity and treatments.



[0857] **Figure 1.** Beta diversity as measured by weighted unifrac of Mayo Endoscopic Score in patients with ulcerative colitis

S858

Upadacitinib for Refractory Crohn's Disease

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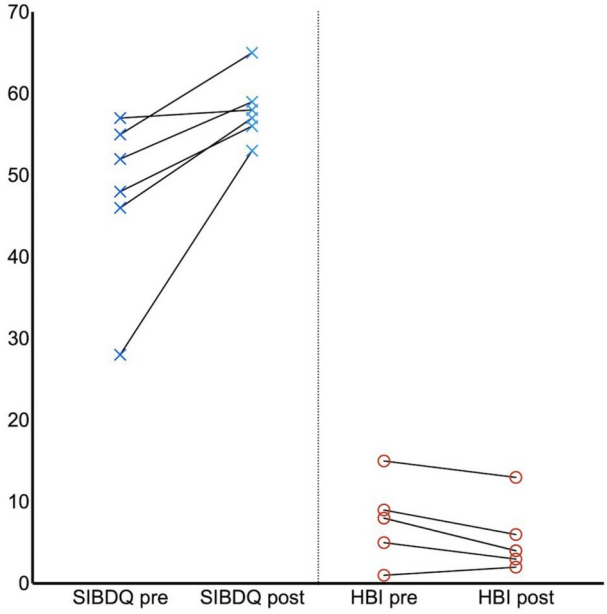
Introduction: Despite many different pharmacologic therapies approved for the treatment of Crohn's disease (CD), many patients are refractory to medical treatment. Upadacitinib (UPA) is an oral JAK-1 inhibitor, which was recently approved for use in ulcerative colitis. Studies looking at its efficacy in CD are ongoing and limited real-world data exists. In this retrospective study, we examine the efficacy and safety of UPA in patients with refractory CD.
Methods: Between July 2021 and May 2022, 11 patients with medically refractory CD were treated with UPA. 10 of the 11 patients had failed 3 or more advanced therapies. We retrospectively examined the response to treatment through prospectively collected patient-reported quality of life scores (SIBDQ questionnaire), Harvey Bradshaw indices (HBI), and laboratory data (ESR, CRP). Statistical analysis was performed with the Wilcoxon matched-pairs signed-rank test.
Results: 11 patients with refractory CD were included (Table). The median duration of therapy was 7 months (range 1-11 months). At the time of UPA initiation, 3 patients were on prednisone. 1 patient had to discontinue UPA after 3 months due to lack of efficacy. SIBDQ and HBI scores were documented in 6 patients before and after UPA. All 6 patients improved or were in clinical remission after UPA (Figure). ESR and CRP were documented in 10 patients pre and post UPA initiation. ESR significantly improved from 20.5 to 4.5. CRP showed a trend towards improvement. Of the 3 patients that were on prednisone at the start, 2 were able to reduce their dose by half and 1 was able to discontinue prednisone. Two patients developed soft tissue infections on UPA with 1 requiring hospitalization.
Conclusion: In this study, we examined our center's experience with UPA to treat refractory CD. Patients not only reported symptomatic improvement but also exhibited a downtrend in inflammatory markers. While our study does have significant limitations, our data suggests UPA may be a safe and effective option for those with refractory CD.



[0858] **Figure 1.** All patients showed improvement or were in clinical remission after starting UPA

Table 1. Patient demographics and prior advanced therapies failed

Patient Characteristic		Number (%)
Gender	Male	3 (27)
	Female	8 (73)
Years of disease	< 10	1 (9)
	10-20	7 (64)
	20-30	3 (27)
Number of advanced therapies failed	2	1 (9)
	3	2 (18)
	4	3 (27)
	5+	5 (45)

S859

Risk of Tofacitinib-Related Adverse Events in Patients With Ulcerative Colitis: A Nationwide Propensity-Matched Cohort Study

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Introduction: A recent randomized, open-label, safety end-point trial found an increased risk of major adverse cardiovascular events (MACE) and malignancy in patients with rheumatoid arthritis who received tofacitinib compared to tumor necrosis factor inhibitor (TNFi). The risk of adverse events in patients with ulcerative colitis (UC) on tofacitinib from population-based observational studies is limited.
Methods: A retrospective cohort study was conducted using TriNetX, a multi-institutional database of more than 70 million patients from 49 healthcare organizations in the USA. We compared the 1-, 2- and 3-year risk of MACE, malignancy, opportunistic infections (OIs) and venous thromboembolism (VTE) between patients with UC on tofacitinib and other biologic agents (control cohort). Sub-group analysis was performed based on type of biologic agent which included TNFi, vedolizumab, and ustekinumab. Exclusion criteria included patients who were on the biologic agent for less than 3 months or had a prior history of any adverse event. 1:1 propensity-score matching was performed for age, gender, race, ethnicity, other autoimmune diseases, primary thrombophilia and all known risk factors for MACE between all the cohorts. Adjusted odds ratios (aOR) with 95% confidence interval (CI) were calculated to express the risk of each adverse event.
Results: Of a total of 94,321 patients with UC, 1056 patients received tofacitinib (mean age 47 +/- 16, 53% male), 4,285 received an TNFi, 2,402 patients received vedolizumab (VDZ), and 1,335 received ustekinumab. There was no difference in the 1-, 2-, and 3-year risk of MACE, malignancy, OIs, and VTE between patients on tofacitinib compared to other biologic agents . In sub-group analysis, there was no difference in the 1-, 2- and 3-year risk of MACE, malignancy and VTE between patients on tofacitinib compared individually to TNFi, vedolizumab and ustekinumab (Table). There is an increased 1-year risk of OIs in patients on tofacitinib compared to TNFi and vedolizumab, and an increased 1-, 2- and 3-year risk of OIs compared to ustekinumab.
Conclusion: In our propensity-matched cohort study of patients with UC, tofacitinib does not confer a higher risk of MACE, malignancy, and VTE than other biologic agents. Further studies are needed to understand the dose-related effect of tofacitinib on the risk of these adverse events.

Table 1. Risk of adverse events between patients on tofacitinib compared to TNFi, vedolizumab and ustekinumab *aOR: adjusted odds ratio

Drug class	Outcome	Year	aOR	95% CI
TNFi				
	MACE	1	0.87	0.46-1.62
		2	0.98	0.56-1.69
		3	1.22	0.63-2.37
	Malignancy			
		1	0.93	0.50-1.76

Table 1. (*continued*)

Drug class	Outcome	Year	aOR	95% CI
		2	1.08	0.61-1.89
		3	1.61	0.71-3.64
	OI			
		1	1.55	1.01-2.37
		2	1.32	0.91-1.93
		3	1.24	0.79-1.94
	VTE			
		1	1.18	0.63-2.20
		2	1.06	0.61-1.84
		3	1.56	0.78-3.13
Vedolizumab				
	MACE			
		1	0.83	0.45-1.55
		2	0.97	0.55-1.70
		3	0.96	0.51-1.82
	Malignancy			
		1	1.17	0.60-2.30
		2	1.18	0.66-2.10
		3	0.89	0.42-1.88
	OI			
		1	1.82	1.15-2.87
		2	1.33	0.90-1.96
		3	1.42	0.86-2.32
	VTE			
		1	1.58	0.76-3.28
		2	1.3	0.71-2.35
		3	2.1	0.97-4.52
Ustekinumab				
	MACE	1	1.63	0.73-3.62
		2	2.06	0.99-4.30
		3	1.78	0.80-3.99
	Malignancy			
		1	1.03	0.53-1.99
		2	1.32	0.68-2.57
		3	0.82	0.38-1.74
	OI			
		1	1.91	1.14-3.20
		2	2.33	1.36-4.01
		3	2.23	1.12-4.44
	VTE			
		1	1.97	0.91-4.24
		2	1.85	0.85-4.02
		3	1.55	0.69-3.350

S860

Efficacy of the Melanocortin Receptor Agonist PL8177 as a Potential Therapy for Gastrointestinal (GI) Inflammatory Diseases

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Introduction: Melanocortin-1 receptors (MC1Rs), found in many tissues including the colon, promote the resolution of inflammation. High potency and no detected systemic absorption make the MC1R agonist PL8177 a promising candidate for oral gut restricted ulcerative colitis (UC) treatment.
Methods: Oral PL8177 capsules were tested in 2 rat UC models and evaluated for distribution, in vivo, in rats, dogs, and humans. UC was induced in rats by dinitrobenzene sulfonic acid (DNBS) or dextran sulfate sodium (DSS). BID doses of 10, 20, 50, 100 or 200 μg PL8177 were compared with vehicle control (placebo) in DNBS and DSS rats. Colitis was assessed by diarrhea and rectal bleeding, and by changes in colon length and weight, and histopathological assessment on termination. Distribution of PL8177 within the GI tract after a single PL8177 dose was investigated in rats and dogs. A phase 0 study using a single oral microdose (70 μg) of [^{14}C]-labeled PL8177 investigated the release of PL8177 in the colon of healthy men. A phase 2 double-blind, placebo-controlled, study will evaluate the safety, tolerability and efficacy of oral PL8177 in adults with UC.
Results: Rats treated with 10-200 μg oral PL8177 demonstrated lower macroscopic colon damage scores and improvement in colon weight, stool consistency, and fecal occult blood vs the vehicle. Histopathology analysis showed PL8177 treatment resulted in the maintenance of intact colon structure and barrier, and reduced immune cell infiltration. In rats and dogs, PL8177 was detected at higher amounts in the colon vs upper GI tract. [^{14}C]-PL8177 and the main metabolite were not detected in human plasma and urine, suggesting that the parent drug [^{14}C]PL8177 was released from the polymer formulation and metabolized within the GI tract. The most efficacious doses ($P< 0.05$ vs vehicle) in the rat studies were 20 and 50 μg, which provide the basis for estimating suitable doses for the phase 2 trial.

Colonic surface area for humans is ~3,000 greater than rat. Considering species-specific MC1R receptor sensitivity differences and other variables, such as GI transit time, pH, and proteolytic enzyme activity, a dose of 20 mg/day was estimated to be the best choice for observation of efficacy in the phase 2 trial.
Conclusion: Collectively, these findings support further development of PL8177 as a treatment option for GI inflammatory diseases in humans. This will be further examined in the phase 2 trial in humans with UC.

S861

Knowledge About Preventive Health Guidelines for Inflammatory Bowel Diseases in Patients: A Quality Improvement Project

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Introduction: Preventive care guidelines for patients with Inflammatory Bowel Disease (IBD) emphasize the need for a patient-centered interdisciplinary approach, with assessment and management of the patient's physical and mental health as well as the IBD. There is no data about compliance with current IBD preventive care guidelines in Puerto Rico. This study aims to evaluate current IBD preventive care in the clinic, and knowledge among patients and gastroenterologists about the preventive care guidelines. The 3-phase study includes retrospective medical record review, an anonymous online survey of gastroenterologists, and an anonymous survey of patients. We report the results of the patient survey.
Methods: Adult patients with an established diagnosis of at least 6 months of ulcerative colitis (UC), Crohn's disease (CD) or indeterminate colitis (IC), were recruited from the IBD Clinics and through IBD-related social media. Questionnaires were filled in the clinic and online using Google forms. Statistical analysis was performed using descriptive statistics. Comparisons of proportions and means between groups was based on Fisher's exact and chi square tests. The study was approved by the MSC IRB.
Results: 83 patients completed the survey, 42 from the clinics and 41 through social media. 60% had CD, 47.4% were diagnosed more than 10 years ago, 57.9% were younger than 38 years old and 68% were on immunosuppressants/biologics. 83.13% and 60.24% of patients knew that COVID and Influenza vaccines were indicated, respectively. However only 42.17%, 36.14%, 32.53% and 31.33% of patients knew about indications for HPV, pneumococcal, varicella and zoster vaccines, respectively. There was a significant difference about knowledge regarding screening for latent TB (p=0.019), anxiety and depression (p= 0.03) and smoking status (p=0.033) between CD and UC/IC patients, as shown in Table.
Conclusion: Our study showed a significant lack of knowledge about IBD preventive care in patients. Strategies to improve patient education are needed. The results of the review of records from the clinic as well as the knowledge of gastroenterologists will point out other deficiencies in the healthcare system and help design methods to improve patient care. Another aspect that needs to be explored is access to preventive measures such as vaccines.

Table 1. **Note: χ21, Fisher exact2 Note**

Variable	CD	UC/IC	Total	p-value
Latent TB				0.019[2]
Yes	37 (46.84%)	15 (18.99%)	52 (65.82%)	
No	3 (3.80%)	2 (2.53%)	5 (6.33%)	
Don't know	8 (10.13%)	14 (17.72%)	22 (27.85%)	
Total	48 (60.76%)	31 (39.24%)	79 (100.00%)	
Anxiety and depression				0.003[2]
Yes	46 (56.79%)	24 (29.63%)	70 (86.42%)	
No	1 (1.23%)	2 (2.47%)	3 (3.70%)	
Don't know	1 (1.23%)	7 (8.64%)	8 (9.88%)	
Total	48 (59.26%)	33 (40.74%)	81 (100.00%)	
Smoking cessation				0.033[2]
Yes	48 (59.26%)	27 (33.33%)	75 (92.59%)	
No	0 (0.00%)	1 (1.23%)	1 (1.23%)	
Don't know	1 (1.23%)	4 (4.94%)	5 (6.17%)	
Total	49 (60.49%)	32 (39.51%)	81 (100.00%)	
Due to rounding error, percentages may not sum to 100%.				

S862

Rates and Outcomes of Histologic Healing in Crohn's Disease

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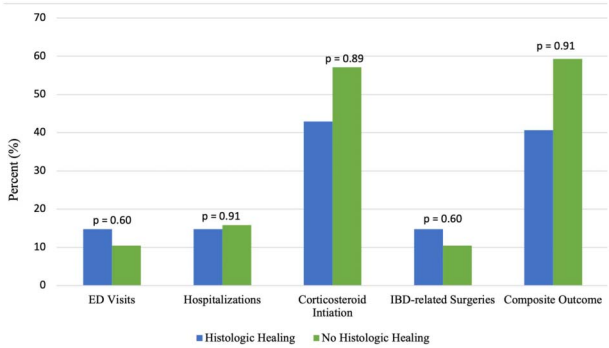
Introduction: Histologic healing (HH) has been associated with favorable outcomes in patients with ulcerative colitis but its clinical significance in Crohn's disease (CD) remains unclear. We aimed to determine the prevalence, predictors, and outcomes of HH in patients with CD.
Methods: This is a single center, retrospective review of CD patients age ≥18 from 1/1/2012-12/1/2021. Patients with and without endoscopic healing (defined as the absence of ulcers or erosions) were included. HH was defined as either normal or chronic inactive/quiescent inflammation on review of pathology reports. The primary outcomes were the prevalence and predictors of HH in both distal ileal and colonic CD. Secondary outcomes included rates of corticosteroid use, CD-related ED visits, surgeries, and hospitalizations analyzed individually and as a composite outcome. Continuous variables were analyzed using an unpaired student's t-test. Categorical variables were analyzed using a chi-square test.
Results: A total of 90 CD patients were included. The median age was 47 years (range 18-85), 52.0% were female, 63.3% had ileocolonic disease, and 72.2% had endoscopic healing. The overall rate of HH was 30.0%. Among patients with endoscopic healing (n=65), 41.5% (n=27) achieved HH. Ileal HH rate was 63.2% and colonic HH rate was 47.6%. There were no significant differences between the HH and non-HH groups in terms of baseline and disease characteristics (Table). The percentage of patients on biologic medications was 70.4% in the HH group vs. 50% in the non-HH group (p=0.1). In the HH group, the rate of corticosteroid initiation was 42.9% vs. 57.1%, (p=0.89) and the rates of ED visits, hospitalizations, and IBD-related surgeries were not significantly different between the two groups (Figure). The composite outcome was noted in 40.7% of patients with HH vs. 59.3% of patients without HH (p=0.91).
Conclusion: In this pilot study, 30% of CD patients achieved HH, with a higher rate of ileal compared to colonic HH. Among patients with endoscopic healing, HH was not associated with any further decrease in adverse clinical outcomes. This study is limited by small sample size and potentially sampling error of endoscopic biopsies due to the patchy nature of CD inflammation. Larger studies are needed to identify predictors and significance of HH in CD.



[0862] **Figure 1.** Comparison of outcomes between histologic healing vs. no histologic healing (*Composite outcome is defined by either discontinuation of therapy/dose escalation, steroid use, ED visits and/or hospitalizations related to active CD).

Table 1. Comparison of Characteristics Between Histologic Healing vs. No Histologic Healing

Patient characteristics	Histologic Healing (n=27)	No Histologic Healing (n=38)	P-value
Baseline characteristics			
Age (years), mean (SD)	52.6 (16.0)	48.7 (17.8)	0.36
Female sex, n (%)	13 (48.2)	26 (68.4)	0.10
Smoking, n (%)	5 (18.5)	4 (10.5)	0.36
Disease duration (years), median (IQR)	16 (7-21)	11.5 (4-21.8)	0.38
Disease characteristics			
Prior bowel resection, n (%)	6 (22.2)	9 (23.7)	0.89
Presence of extraintestinal manifestations, n (%)	7 (25.9)	11 (28.9)	0.79
Perianal disease, n (%)	8 (29.6)	11 (28.9)	0.95
Medication factors			
On biologic, n (%)	19 (70.4)	19 (50.0)	0.10
On immunomodulator, n(%)	6 (22.2)	7 (18.4)	0.71

S863

Impact of Race on ANTI-TNF Immunogenicity in Patients with Inflammatory Bowel Disease

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Introduction: Immunogenicity is a major contributor to anti-tumor necrosis factor (anti-TNF) treatment failure in inflammatory bowel disease (IBD). Immunomodulator and anti-TNF combination therapy is associated with a decreased risk of immunogenicity. Anti-TNF immunogenicity was recently linked to HLA-DQA1*05 genotype. This study aims to determine the impact of race on rates of immunogenicity and treatment outcomes of IBD pts on anti-TNF combination therapy.
Methods: This was a single-center, retrospective study of IBD pts who have been treated with immunomodulators and anti-TNF combination therapy between 2012 and 2020. Our primary outcomes were the rates of anti-TNF antibody formation and mean anti-TNF drug levels between Caucasian group(CG) and non-Caucasian group(NCG) on combination therapy. Secondary outcomes included steroid-free clinical remission (SFCR), endoscopic remission (ER) (absence of ulcers/erosions in CD and Mayo endoscopic score ≤ 1 for UC), & normal serum C-reactive protein (CRP) (defined as ≤ 5. mg/L). Continuous variables were analyzed using unpaired student's t-test. Categorical variables were analyzed using a chi-square test.
Results: A total of 124 pts were included (CD; 68.5%, UC; 27.4%, indeterminate colitis; 3.2%, pouchitis; 0.9%). The median age was 32 years (range 13-69), and 54.8% were male. A total of 87 pts were on infliximab & 37 pts were on adalimumab. Combination therapy with thiopurine was employed in 87.1% while 12.9% were on methotrexate. A total of 85 pts were self-identified as Caucasian. There were no significant differences between CG vs NCG in terms of baseline and disease characteristics (Table). Anti-TNF antibody formation was observed in 32.9% of pts in the CG, and 20.5% of pts in the NCG (p=0.16). Mean anti-TNF drug levels were lower in the CG at 15.4 ± 14.5 μg/mL vs. the NCG at 22.7 ± 15.1 μg/mL (p=0.01). SFCR was observed in 61.2% vs. 58.9% (p=0.82) in CG vs. NCG, respectively. In CG 42.4% vs. 33.3% in NCG (p=0.34) discontinued anti-TNF treatment during follow-up. ER was observed in 45.9 % vs 51.3% (p=0.44), and normal CRP was observed in 51.8% vs. 58.9% (p=0.28) in CG vs. NCG, respectively.
Conclusion: In our cohort, Caucasian pts on anti-TNF combination therapy for IBD had significantly lower anti-TNF drug levels as compared to the non-Caucasian group. However, there was no significant difference between rates of anti-TNF antibody formation and clinical outcomes between the groups. Larger studies are needed to clarify impact of race on anti-TNF therapy.

Table 1. Comparison of Characteristics Between Caucasian vs. Non-Caucasian Race

Caucasian (n=85), n (%), mean (SD)	Non-Caucasian (n=39), n (%), mean (SD)	P-value
34.7 (13.7)	34.7 (11.7)	0.98
47 (55.3)	21 (53.9)	0.88
7 (8.2)	6 (15.4)	0.23
36.4 (27.1)	41.9 (31.8)	0.35
		0.07
53 (62.4)	32 (82.1)	

Table 1. (*continued*)

Caucasian (n=85), n (%), mean (SD)	Non-Caucasian (n=39), n (%), mean (SD)	P-value
29 (34.1)	5 (12.8)	
2 (2.3)	2 (5.1)	
1 (1.2)	0	
21 (24.7)	15 (38.5)	0.12
24 (28.2)	14 (35.9)	0.81
10 (11.8)	6 (15.4)	0.77
61 (71.8)	26 (66.7)	0.56
69 (81.2)	29 (74.4)	0.39
12.5 (21.4)	6.8 (7.6)	0.15
3.9 (0.6)	4.1 (0.4)	0.16

*Data missing for 68 patients.
**Data missing for 42 patients.
Abbreviations: Anti TNF, anti-tumor necrosis factor; CRP, C reactive protein.

S864

Racial and Ethnic Disparities in Hospitalizations and Emergency Department Use of Persons With Inflammatory Bowel Disease: A Systematic Review and Meta-Analysis

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Introduction: The prevalence of inflammatory bowel disease (IBD) is rising worldwide though it remains unknown how race or ethnicity influences IBD-related healthcare utilization. We aimed to determine potential differences in IBD-related hospitalizations and emergency department (ED) visits amongst different races and ethnicities.
Methods: Electronic databases (Medline and Embase) were searched through December 20th, 2021. All studies reporting IBD-related hospitalizations, readmission after discharge, and ED visits by race or ethnicity were included. Differences in IBD location, phenotype, and treatment between races and ethnicities were assessed. Effect estimates were reported as odds ratios (OR) with 95% confidence intervals (CI). Where applicable, subgroup analysis restricting patient age (pediatric vs. adult) was performed. Heterogeneity was assessed using the I^2 statistic, with >50% suggesting significant heterogeneity.
Results: Twenty-three observational studies assessed the influence of race and ethnicity on IBD-related hospitalizations and 7 studies on ED visits. Compared to White patients, the likelihood of IBD-related hospitalization was higher in Black (OR 1.54, 95% CI, 1.06-2.24, I^2=77.0%) and Hispanic (OR 1.38, 95% CI, 1.01-1.88, I^2=37.0%) but not Asian (OR 0.34, 95% CI, 0.02-7.40, I^2=95.0%) or South Asian (OR 1.09, 95% CI, 0.47-2.53, I^2=60.0%) patients. Furthermore, Black patients had a higher likelihood of readmission to the hospital up to 12 months after discharge compared to White patients (OR 1.41, 95% CI, 1.09-1.82, I^2=41.0%). Black adult, but not pediatric, patients had greater odds of IBD-related ED visits compared to adult White patients (OR 1.74, 95% CI, 1.32-2.30, I^2=0%). Compared to White patients, Black patients were less likely to have ileal disease, more likely to have perianal disease, and have similar likelihood of receiving biologic therapy. No differences in disease phenotype or therapy exposure were observed between other races.
Conclusion: Black patients with IBD are more likely to be hospitalized, readmitted within 12 months, and visit the ED for IBD reasons compared to White patients. Disease phenotype and severity do not account for these differences. As such, future research is imminently required to determine factors behind these differences to promote, and achieve, equiTable care for all persons living with IBD.

S865

Impact of Inflammatory Bowel Disease in Colonic Resection for Those Hospitalized With *Clostridioides difficile* Colitis: Insights From the National Inpatient Sample

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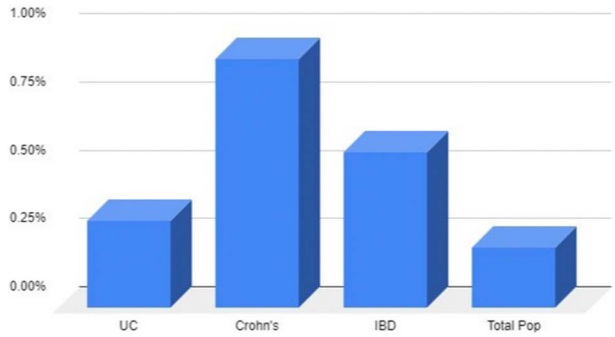
Introduction: *Clostridioides difficile* (C. diff) is a common nosocomial infection with symptoms that range from a mild diarrheal illness to severe, life-threatening colitis. While there is sufficient data demonstrating risk factors, an understanding of factors for developing more severe disease is lacking. Previous literature has shown increased mortality for patients with inflammatory bowel disease (IBD) who become infected with c. difficile, however, a connection between IBD and need for colonic resection has not been established.
Methods: This is a retrospective cohort study using the 2019 National Inpatient Sample (NIS). Inclusion criteria were a principal diagnosis of Clostridioides difficile colitis and age >18. The patients were divided into two groups: those with IBD and those without IBD. IBD was further subdivided into those with ulcerative colitis (UC) and those with Crohn's disease (CD). The primary outcome is rate of colonic resection. Secondary outcomes are: 1) mortality 2) rate of colonoscopy 3) length of stay 4) total hospital charges. Confounders were adjusted for using multivariate regression analysis with the following confounders: sex, income, race, insurance, Charlson comorbidity index, hospital bedsize, location, teaching status, and region.
Results: 76,324 Patients were included in the study, 4.1% with IBD. Both groups predominantly consisted of Caucasian females treated at large, urban teaching hospitals in the Southern United States. 0.22% of the total population studied underwent resection. Compared to the rate of resection in patients without IBD, those with IBD had a 180% increase in odds of colonic resection when compared to patients without IBD while adjusting for confounders. This difference was most notable in the CD subgroup (OR of 4.41). Patients with IBD were also more likely to undergo colonoscopy (OR 3.4) and had hospital charges on average $6,799 more than those without IBD. (Figure)
Conclusion: Those with IBD face an even higher burden of disease than those diagnosed with C. diff without IBD. Both forms of IBD increase the likelihood of the adverse event of colonic resection as a consequence of infection of C. diff while hospitalized, with CD patients having stronger odds of this outcome compared to those diagnosed with UC. With such a strong increase of unfavorable outcomes amongst patients diagnosed with IBD, hospitals should consider implementing stronger measures to prevent nosocomial C. diff amongst those admitted with IBD.



[0865] **Figure 1.** Graphical representation of nonobese versus obese patients hospitalized for Clostridioides difficile who underwent colonic resection during hospitalization. UC = ulcerative colitis; CD = Crohn's Disease; IBD = Inflammatory Bowel Disease

S866

Malnutrition and Opioid Use Disorder Are Associated With Higher 30-Day Readmission Rates in Patients Initially Admitted for Ulcerative Colitis

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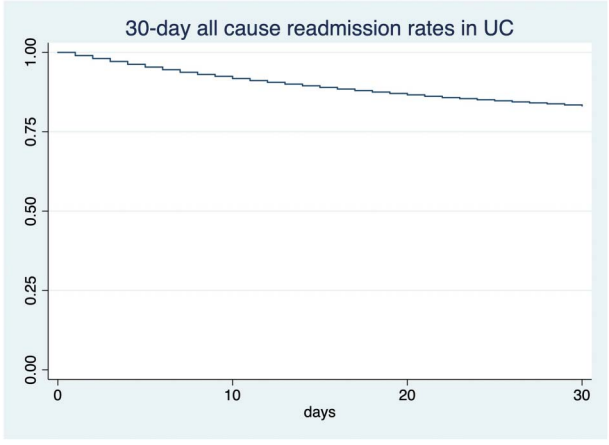
Introduction: Ulcerative colitis (UC) is a chronic disorder that predisposes patients to multiple complications. Readmissions to the hospital pose a burden to patients and health-care systems. Preventing readmissions is important for quality of care and quality of life of patients with UC. We aim to identify the incidence of 30-day readmissions and its predictors.
Methods: Retrospective review of the 2018 National Readmission Database (NRD) of adult patients readmitted after an index admission of UC. ICD-10CM/PCS codes were used to identify UC, other comorbidities and procedures. We identified the most common causes for readmission and independent risk factors for readmission were identified using Cox regression analysis.
Results: A total of 68,889 index admission (IA) patients were identified, out of which 16.5% (n=11,411) were readmitted within 30-days of discharge. 8.3% of readmissions were secondary to sepsis. Readmitted patients had higher rates of in-hospital mortality (3.4% vs. 2.1%; P< 0.01). Readmitted patients were less likely to be female (50.5% vs 52.8%; P< 0.01), to have private insurance (34.4% vs 40.3%; P< 0.01), to undergo colonoscopy (10.8% vs 17.7%; P< 0.01) and to be from the highest quartile of income (21.9% vs 23.3%; P=0.01). They were more likely to be older (54.0 vs 53.2 years; P< 0.01), to have a Charlson Comorbidity Index (CCI) score of ≥3 (34.1 vs 24.1; P< 0.01), to be from large metropolitan areas with at least 1 million residents (61.1 vs 59.9; P< 0.01), to require parenteral nutrition (3.2% vs 1.5%; P< 0.01), to be malnourished (20.3% vs 11.8%; P< 0.01), to have concomitant Clostridium difficile (6.9% vs. 5.7%; P< 0.01), primary sclerosing cholangitis (0.5% vs 0.2%; P< 0.01) and opioid use disorder (OUD) (3.5% vs 2.4%; P< 0.01). Independent predictors of readmission were CCI of ≥ 3 (aHR 1.95; 95% CI [1.78- 2.13]), undergoing ileostomy during IA (aHR 1.39; 95% CI [1.06-1.82]), increasing LOS (aHR 1.00; 95% CI [1.00-1.01]), malnutrition (aHR 1.29; 95% CI [1.17-1.43]) and OUD (aHR 1.45; 95% CI [1.26-1.68]). Private insurance (aHR 0.78; 95% CI [0.72-0.85]), female gender (aHR 0.92; 95% CI [0.87-0.98]) and younger age (aHR 0.99; 95% CI [0.99-0.99]) were associated with less odds of early readmission. (Figure) (Table)
Conclusion: The 30-day readmission rate for UC in 2018 was 16.5%. Readmission is associated with higher mortality and are associated with risk factors such as malnutrition and OUD. Early readmissions in UC continues to pose a high burden to patients and our health-care system.



[0866] **Figure 1.** Kaplan Meier graph of 30-day readmission

Table 1. Independent Predictors of 30-day readmission

Variable	Adjusted odds ratio (95% confidence interval)	P value
Female	0.92 (0.87-0.98)	< 0.01
Age	0.99 (0.99-0.99)	< 0.01
Length of stay	1.00 (1.00-1.01)	< 0.01
Insurance Provider		
Medicare	Reference	Reference
Medicaid	0.96 (0.87-1.06)	0.48
Private	0.78 (0.72-0.85)	< 0.01
Uninsured	0.81 (0.69-0.96)	0.01

Table 1. (*continued*)

Variable	Adjusted odds ratio (95% confidence interval)	P value
Charlson Comorbidity Index Score		
0		
1	Reference	Reference
2	1.12 (1.03-1.22)	< 0.01
≥3	1.37 (1.24-1.51)	< 0.01
Patient residence		
Large metropolitan area with at least 1 million residents	Reference	Reference
Small metropolitan areas with less than 1 million residents	0.98 (0.92-1.05)	0.75
Micropolitan areas	0.94 (0.79-1.12)	0.53
Not metropolitan or micropolitan (nonurban residual)	0.75 (0.55-1.04)	0.08
In-Hospital Procedures		
Partial Colectomy	0.91 (0.62-1.32)	0.63
Total colectomy	0.92 (0.70-1.22)	0.58
Ileostomy	1.39 (1.06- 1.82)	0.01
Colonoscopy	1.04 (0.89-1.23)	0.57
Parenteral nutrition	1.19 (0.97-1.46)	0.09
Other Comorbidities		
Malnutrition	1.29 (1.17-1.43)	< 0.01
Obesity	1.00 (0.92-1.08)	0.95
PSC	1.44 (0.98-2.11)	0.06
Alcohol use disorder	1.05 (0.92-1.19)	0.42
Opioid use disorder	1.45 (1.26-1.68)	< 0.01
Cannabis use disorder	0.87 (0.72-1.06)	0.18
Diabetes type 1	1.49 (0.98-2.26)	0.06
Diabetes type 2	1.01 (0.93-1.09)	0.74
Shock	1.09 (0.87-1.38)	0.41
Teaching bed size		
Small	Reference	
Medium	0.96 (0.87-1.06)	0.45
Large	1.06 (0.97-1.15)	0.16

S867

Using the Tools of Functional Medicine Improves the Multi-Disciplinary Model of Care of the IBD Patient

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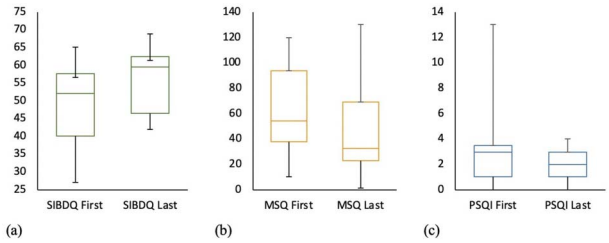
Introduction: Inflammatory Bowel Disease (IBD) is a chronic, multifaceted disease that often coexists with extra-intestinal manifestations (EIMs) and persistent GI symptoms despite remission. Functional medicine is a patient-centered, complementary approach to care that focuses on diet and modifiable lifestyle factors (MLF). An individualized functional medicine program was developed for IBD patients at a tertiary care IBD center with the goal of supporting traditional IBD care and improving symptoms and quality of life.
Methods: Between December 2020 and April 2022, clinically stable IBD patients with persistent GI symptoms or EIMs were offered access to our IBD functional medicine clinic (FMC), where they had individual appointments with a dietician, functional medicine provider, and social worker. They received education on nutrition and techniques to address stress, sleep quality, and other MLFs. Prior to each visit, the following patient-reported outcome (PRO) surveys were administered: the SIBDQ (Short Inflammatory Bowel Disease Questionnaire), FSS (Fatigue Severity Scale), PSQI (The Pittsburgh Sleep Quality Index), and MSQ (Medical Symptoms Questionnaire). Statistical analysis was performed with Wilcoxon matched-pairs signed-rank test. (Figure)
Results: 40 patients were consented. Of those, 27 patients attended FMC and completed PRO surveys at least twice (21 CD, 5 UC, 1 indeterminate; 9 men, 18 women). The range of disease length was 0-35 years. 16 of 27 indicated they were extremely ready to make diet and MLF changes. Median SIBDQ increased from 52 to 58 with statistical significance. There was a trend towards improvement in MSQ, FSS, and PSQI, although without statistical significance. The MSQ subsets of joint and weight symptoms showed significant improvement. Patients who indicated readiness for change significantly improved their SIBDQ, MSQ and PSQI. (Table)
Conclusion: In patients with stable IBD, persistent symptoms may be related to dietary or psychosocial triggers, which are the key targets of functional medicine care. A previous retrospective design looked at the functional medicine approach to care in a shared medical appointment standardized program and found improvement in areas of sleep, fatigue, and medical symptoms. This prospective study of an individualized functional medicine IBD program showed that patients who were ready for change improved in MSQ and PSQI compared to the entire cohort, while the entire cohort significantly improved their SIBDQ regardless of readiness for change.



[0867] **Figure 1.** SIBDQ, MSQ, and PSQI significantly improved in patients who indicated readiness for change

Table 1. Median PROs Showed Trends Towards Improvement, with Significant Improvement in SIBDQ

	First score median (range)	Last score median (range)	p-value
SIBDQ	52 (27-65)	58 (34-68)	< 0.05
MSQ	51 (10-120)	37 (1-130)	0.2
FSS	39 (15-57)	35 (17-63)	0.5
PSQI	3 (0-13)	2 (0-5)	0.15

S868

Safety and Efficacy of Vedolizumab in Elderly Patients With Inflammatory Bowel Disease: A Systematic Review and Meta-Analysis

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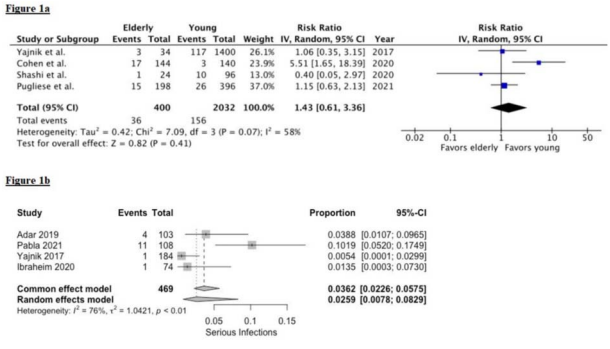
Introduction: Global incidence and prevalence of inflammatory bowel disease (IBD) continues to rise, especially for individuals ≥60 years of age. There remains paucity of data on the use of biologics like Vedolizumab in elderly patients, as they are underrepresented in clinical trials. We performed a systematic review and meta-analysis to provide real-world data on the clinical efficacy and safety of Vedolizumab in the elderly population.
Methods: A systematic search of several databases including Ovid EBM reviews, Ovid Embase, Ovid Medline, Scopus, and Web of Science was performed through May 2022 to identify studies which assessed the safety and efficacy of Vedolizumab therapy in the elderly population. Pooled proportion and risk ratios (RR) were calculated using the random-effects model. Heterogeneity was assessed using Cochran Q statistical test and I^2 statistics.
Results: A total of 11 studies with 3,546 IBD patients were included in our final analysis (1,314 elderly and 2,232 young). Mean age at initiation of vedolizumab therapy was 63.6–72.2 years for the elderly cohort. Pooled rate of endoscopic, clinical, and steroid-free remission for elderly IBD patients was 32.69% (95% CI: 27.71-38.09; I 2 93%), 37.95% (95% CI: 33.08-43.06; I2 13%) and 38.7% (95% CI: 31.63-46.43; I2 57%), respectively. Although elderly patients had lower rates of steroid-free remission, we did not find a statistically significant difference in rates of clinical or endoscopic remission when compared to younger patients. The pooled rate of overall and serious infections in the elderly cohort was 8.6% (95% CI: 6.83-10.8; I 2 23%) and 3.6% (95% CI: 2.26-5.75; I2 76%), respectively. Pooled rate of IBD-related surgery and IBD-related hospitalizations was 8.64% (95% CI: 6.97-10.65; I2 78%) and 10.54% (95% CI: 8.37-13.2; I2 0%), respectively. There was no statistical difference in overall infections and IBD-related surgeries between elderly and young IBD patients, RR 1.43 (95% CI: 0.61-3.36; I2 58%), p=0.4 and RR 1.20 (95% CI: 0.79-1.84; I2 16%), p=0.4, respectively. (Figure)
Conclusion: Our analysis demonstrates that when compared to young IBD patients, Vedolizumab is equally safe and efficacious in inducing clinical and endoscopic remission in elderly patients.



[0868] **Figure 1.** a: Risk Ratio (RR) of overall infections. b: Pooled rates of serious infections

S869

Real World Clinical Effectiveness and Safety of Vedolizumab and Adalimumab in Biologic-Naïve Patients With Crohn's Disease: Results From the EVOLVE Study

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Introduction: Vedolizumab (VDZ, a gut selective anti-α4β7-integrin) and adalimumab (ADA, anti-tumor necrosis factor) are approved biologic treatments for moderate to severe Crohn's disease (CD). We aimed to evaluate the real-world clinical effectiveness and safety of VDZ versus ADA in biologic-naïve patients with CD.
Methods: This was a retrospective cohort study in adult patients with CD who received first-line biologic treatment with VDZ or ADA at 37 sites in the US, Canada, and Greece. The index date was defined as the date of first-line biologic initiation between May 2014 and March 2018. Cumulative rates of treatment persistence and clinical outcomes over 12 months were estimated using the Kaplan-Meier method. Patients were censored at loss of follow up, death, end of chart abstraction, treatment discontinuation, or dose escalation, whichever came first. Clinical outcomes were assessed using pre-defined hierarchical algorithms of standard measures.[1] Survival analyses were conducted for safety outcomes, CD-related exacerbations and CD surgeries. Adjusted analyses were performed using stabilized inverse probability weighting using baseline covariates.

Results: 362 patients were included (VDZ: 218; ADA: 144). Baseline characteristics are shown in Table. Cumulative rates of clinical response (68.5% vs 61.1%; p=0.59) and mucosal healing (67.7% vs 56.0%; p=0.56) over 12 months were similar between treatment cohorts, whilst clinical remission rates (66.3% vs 46.4%; p< 0.01) were greater in VDZ- versus ADA-treated patients. Over 12 months, VDZ-treated patients were more likely to persist on treatment versus ADA-treated patients (89.3% vs 77.5%; p=0.02). VDZ-treated patients were significantly less likely to experience (incidence rates per 1000 person-years; HR [95%CI]) serious adverse events within 1 year (78.9 vs 166.2; 0.45 [0.22-0.93]), but there were no statistical differences in CD exacerbations (207.7 vs 261.8; 0.91 [0.56-1.47]), CD-related surgeries (10.3 vs 16.0; 1.55 [0.21-11.15]) or serious infections (20.5 vs 71.2; 0.27 [0.06-1.20]) versus ADA-treated patients.
Conclusion: In a real-world setting in biologic-naïve patients with CD, VDZ-treated patients had equivalent rates of response and mucosal healing but a greater likelihood of persisting on treatment and achieving clinical remission versus ADA-treated patients. Studies assessing outcomes after dose optimization are needed.

Table 1. Baseline Characteristics of Biologic Naïve Patients with Crohn's Disease Treated with Vedolizumab or Adalimumab

Baseline Characteristics	Vedolizumab N=218	Adalimumab N=144	p-value
Age, Mean (SD)	51.7 (16.8)	40.0 (14.9)	< **0.001**
Male, n (%)	114 (52.3)	75 (52.1	**0.969**
Disease duration, n with available data	176	111	**0.016**
< 2 years, n (%)	50 (28.4)	50 (45.0)	
2- < 5 years, n (%)	32 (18.2)	16 (14.4)	
≥ 5 years, n (%)	94 (53.4)	45 (40.5)	
Median (min-max) observation period, (months)*	15.7 (4.2-45.9)	19.3 (6.1-49.3)	< 0.001
Crohn's disease location at index, n with available data	196	121	0.047
Colonic with/without upper GI disease, n (%)	42 (21.4)	35 (28.9)	
Ileal with/without upper GI disease, n (%)	85 (43.4)	36 (29.8)	
Ileocolonic with/without upper GI disease, n (%)	69 (35.2)	50 (41.3)	
Disease severity at index, n with available data	180	116	0.161
Moderate, n (%)	84 (46.7)	58 (50.0)	
Severe, n (%)	17 (9.4)	17 (14.7)	

Abbreviations: GI = gastrointestinal; SD = standard deviation.
*While all patients were required to have 6 months follow-up from time of treatment initiation to data abstraction, some patients were lost to follow-up and therefore minimum duration during the observation period was <6 months.

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S870

Physical Activity as an Adjunct Therapy in Quiescent and Mildly Active Inflammatory Bowel Disease: A Systematic Review and Meta-Analysis

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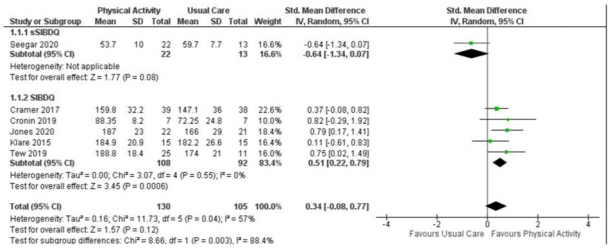
Introduction: Individuals with IBD in remission (i.e. quiescent IBD) can continue to have several symptoms, such as fatigue and depression. Physical activity (PA) may benefit people with quiescent IBD by improving immunological response and psychological health. The aim of our study was to distill available evidence on the efficacy and safety of PA to relieve persistent symptoms of fatigue, joint pain, abdominal pain, stress, anxiety, and depression; and improve health-related quality of life (HRQoL) in individuals with quiescent or mildly active IBD.
Methods: We searched for RCTs and non-RCTs in eight databases, trial registries and conference proceedings. Trials using PA as an adjunct therapy in the management of adults (>18 years) with quiescent or mildly active IBD, published in English between 2011 and 2021 were identified. Risk of bias of RCTs and non-RCTs was assessed using the Cochrane Risk of Bias tool and Newcastle Ottawa scale respectively.
Results: We identified seven RCTs and one non-RCT that met our inclusion criteria. PA was moderately efficacious in improving HRQoL among trials using similar outcome measures (standardized mean difference (SMD) 0.51, 95% CI 0.22 to 0.79; I2 0%), and reducing anxiety (SMD -0.35, 95% CI -0.65 to -0.05; I2 0%). There was insufficient evidence to make conclusions regarding changes in fatigue and depression. Only one study reported on stress, and only one study reported on joint pain. None was identified for abdominal pain. All trials deemed PA safe for individuals with quiescent or mildly active IBD who experience persistent symptoms. Average adherence rate in PA programs was 69%. (Figure)
Conclusion: PA is efficacious in improving HRQoL and alleviating anxiety in those with quiescent or mildly active IBD. However, more RCTs are required to precisely estimate the magnitude of effect and make more definitive conclusions about the efficacy of PA as an adjunct therapy for adults with IBD.



[0870] **Figure 1.** Sub-Group Analysis HRQoL

S871

Patient Satisfaction With and Access to Virtual Healthcare for Inflammatory Bowel Disease During the COVID-19 Pandemic

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Introduction: Onset of the COVID-19 pandemic triggered changes to healthcare delivery from in-person to virtual visits. The study objective is to understand how the COVID-19 pandemic impacted healthcare for patients with inflammatory bowel disease (IBD).
Methods: An online survey using closed- and open-ended questions was conducted in English and French among Canadian adults (>18 years) with IBD (Crohn's disease, ulcerative colitis, IBD-unclassified). Survey questions were specific to patient experiences receiving healthcare for IBD during the COVID-19 pandemic. Descriptive statistics, frequency tabulations and qualitative analysis were used to analyze data.
Results: Preliminary analysis of 158 respondents (mean age 34.3 (sd 10.3), 87% female, 52% university degree or higher, 90% white) show that 44% received all IBD care virtually, 4% received all care in-person, 51% used both modalities and 2% did not receive care during the pandemic. Of those that received virtual care, 38% were totally satisfied, 51% were somewhat satisfied, and 11% were not satisfied with the care received. Virtual visits were done mostly using phone calls. Respondents classified access to healthcare providers during the pandemic as easier (14%), about the same (61%) or more difficult (25%) compared to before the pandemic. Virtual visits were a good option for follow-up visits and simple checkups as respondents indicated they were safe, timely and convenient and avoided travel and parking costs. Some respondents felt listened to but others felt rushed, dismissed and in need of a physical examination. For patients starting with a new doctor, virtual visits left them feeling disconnected. When the doctor missed the virtual visit, respondents expressed difficulties rescheduling the appointment. Going forward, respondents want to continue having options for: virtual visits by either phone and videoconferencing; online access to test results and scheduling of appointments; email communication with the nurse/doctor; and faxing prescriptions to the pharmacy.
Conclusion: During the pandemic, most respondents had received some of their IBD healthcare virtually and were satisfied with the care received. The majority reported having about the same access to their IBD healthcare providers as before the pandemic. Despite needing to improve some virtual services such the rescheduling of missed virtual visits, nearly all survey respondents wanted virtual health care to continue into the future.

S872

Increased Risk of Gout in Patients With Inflammatory Bowel Disease: A Population-Based Study

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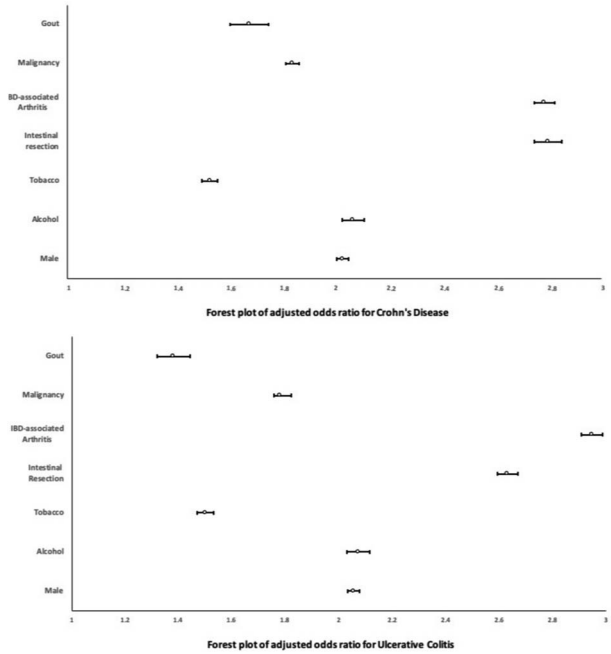
Introduction: Arthritis is a recognized extra-intestinal manifestation of inflammatory bowel disease (IBD). Studies show altered uric acid metabolism in patients with IBD. Gout is a crystal deposition disease characterized by hyperuricemia that exceeds the limit of urate solubility and causes tissue depositions leading to inflammatory arthritis. This study aims to investigate the association between IBD and gout.
Methods: We used a commercial database (Explorys Inc, Cleveland, OH), an aggregate of Electronic Health Record data from 26 US healthcare systems. We identified adults with the diagnosis of Crohn's disease (CD), and ulcerative colitis (UC) from 1999 to 2022. In this cohort, we identified patients who developed a clinical diagnosis of gout. We collected demographic data including age, gender and race. We also identified patients with diagnosed IBD-associated arthritis and those who had intestinal resection. Risk factors associated with gout like chronic kidney disease (CKD), malignancy, alcohol and smoking are collected. Univariate and multivariate analysis are used to assess the association of CD and UC with gout, accounting for risk factors. (Figure)
Results: Out of the 69,260,780 adult patients in the database, we identified 209,020 patients with UC (0.30%) of whom 9130 had gout (4.3%). In addition, 249,480 had CD (0.36%) of whom 14000 had gout (5.61%). The majority of patients were > 65 years old. Males were more prevalent in the UC and gout groups than in the CD and gout groups (58% vs 51%). The majority were Caucasians across the two groups. Adjusting for age, gender, CKD, malignancy, IBD-associated arthritis, intestinal resection, alcohol and smoking, CD is significantly associated with gout (OR 1.68 CI [1.60-1.75]). UC is also found to be significantly associated with gout (OR 1.38 CI [1.31-1.44]). In subgroup analysis in both groups against intestinal resection, CD group who had intestinal reaction had higher association with gout vs no surgery (OR 2.34 [2.25-2.43]). Similar increase is observed in UC group who had intestinal resection (OR 1.53 [1.49-1.56]).
Conclusion: In this large retrospective study, we found that IBD is strongly associated with gout with higher correlation observed with CD. Intestinal resection is associated with an increase in the risk of gout. Patients with IBD who present with new-onset arthritis should be investigated for gout. (Table)



[0872] **Figure 1.** Title: Forest Plots for Adjusted Odds Ratio for Crohn's disease and Ulcerative Colitis

Table 1. Demographic characteristics of IBD patients with gout

	UC + Gout	CD + Gout
Total Cohort	9130	14000
Age 18-65	2740 (30%)	5340 (38%)
Age >65	6350 (70%)	5870 (61%)
Gender		
Male	5290 (58%)	7120 (51%)
Female	3820 (42%)	6850 (49%)

Table 1. (*continued*)

	UC + Gout	CD + Gout
Race		
Caucasian	7480 (82%)	11570 (83%)
AA	960 (11%)	1220 (9%)
Asian	110 (1%)	350 (3%)
Hispanic	30 (0.3%)	120 (1%)
Unknown	550 (6%)	740 (5%)

Footnote: UC: Ulcerative Colitis; CD: Crohn's disease; AA: African American.

S873

Preoperative Risk Factors of Adverse Events in Older Adults Undergoing Bowel Resection for Inflammatory Bowel Disease: 15-Year Assessment of ACS-NSQIP

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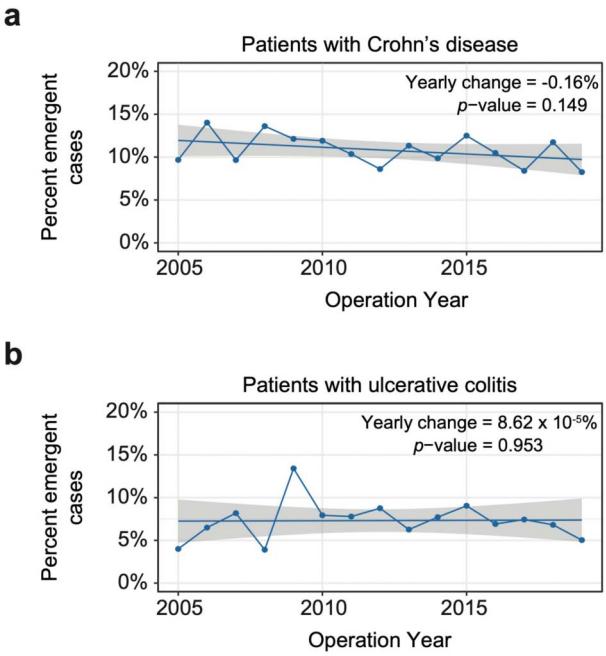
Introduction: Nearly a quarter of older adults with inflammatory bowel disease (IBD) require surgery. Patients with IBD are at risk for complications postoperatively and this risk is increased in older adults. However, little is known about the risk factors leading to these complications. We assessed risk factors associated with adverse postoperative outcomes among older adults who underwent IBD-related surgery, as well as evaluated trends in emergency vs. elective surgery in this population.
Methods: Using the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database, we identified adults ≥60 years of age who underwent an IBD-related intestinal resection from 2005-2019. Our primary outcome included a 30-day composite of mortality, readmission, reoperation, and/or what we identified as serious complications listed in NSQIP.
Results: In total, 9,640 intestinal resections were performed among older adults with IBD from 2005-2019, with 48.3% having undergone resection for Crohn's disease (CD), and 51.7% for ulcerative colitis (UC). Nearly 37% experienced an adverse outcome, with the most common complication being infection (20.21%). From 2005 to 2015, there was no decrease in the number of emergent cases among older adults. On univariate analysis, higher rates of adverse postoperative outcomes were seen with increasing age ($p< 0.001$), with nearly 50% of those ≥80 years of age having an adverse outcome. Patients who underwent an emergency surgery had a higher likelihood of postoperative complications (66.86%; $p< 0.001$). On multivariable analysis, albumin ≤3 (aOR 1.99; 95%CI 1.69-2.33), the presence of two or more comorbidities (aOR, 1.50; 95%CI 1.27-1.76), totally dependent functional status as compared to those partially dependent or independent (aOR, 7.28; 95%CI 3.14-21.2), and emergency surgery (aOR, 1.70; 95% CI 1.36-2.11) significantly increased the odds of an adverse outcome. (Figure)
Conclusion: Overall 37% of older adults with IBD experienced an adverse outcome as a result of IBD-related surgery. Limited functional health status, low preoperative serum albumin levels, and those undergoing emergent surgery were associated with a significantly higher risk. This is particularly important as the number of older adults with IBD is increasing, with a persisting number of emergency cases over time. Given the high rate of surgery in this population, future research should focus on preoperative rehabilitation, nutritional optimization, and timely surgery to improve outcomes. (Table)



[0873] **Figure 1.** Emergency trends between 2005-2015 according to ACS-NSQIP stratified by IBD subtype

Table 1. **Adjusted Odds between Preoperative Characteristics and Poor Postoperative Outcomes among Older Adults with IBD who Underwent IBD-Related Bowel Resection from 2005-2019**

Characteristics	Adjusted OR[a] (95% CI)	p-value
Age (years)		
60-70	Ref	-
70-80	1.01 (0.89-1.14)	0.882
≥80	1.02 (0.81-1.29)	0.845

Table 1. (*continued*)

Characteristics	Adjusted OR[a] (95% CI)	p-value
Sex		
Male	Ref	-
Female	1.03 (0.92-1.15)	0.559
Race		
Asian/Hawaiian	Ref	-
Non-Hispanic Black	1.14 (0.66-2.01)	0.641
Non-Hispanic White	1.19 (0.73-2.00)	0.494
Other	1.56 (0.58-4.13)	0.369
IBD[b]		
UC	Ref	-
CD	1.22 (1.09-1.36)	< 0.001
Preoperative Serum Albumin		
0-3	1.99 (1.69-2.33)	< 0.001
3-3.5	Ref	-
3.5-10	0.69 (0.6-0.8)	< 0.001
BMI[c]		
0-18.5	0.81 (0.63-1.05)	0.11
18.5-25	Ref	-
25-30	1.03 (0.9-1.17)	0.667
30+	1.2 (1.04-1.4)	< 0.05
Current Smoker[d]		
No	Ref	-
Yes	0.9 (0.76-1.07)	0.256
Comorbidities[e]		
0-1	Ref	-
1-2	1.15 (1.02-1.3)	< 0.05
2-7	1.5 (1.27-1.76)	< 0.001
Functional Health Status		
Independent	Ref	-
Partially Dependent	1.72 (1.28-2.32)	< 0.001
Totally Dependent	7.28 (3.14-21.2)	< 0.001
Malnourishment[f]		
No	Ref	-
Yes	1.23 (1.03-1.48)	< 0.05
Sepsis within 48 hours prior to surgery		
No	Ref	-
Yes	2.18 (1.78-2.67)	< 0.001
Emergency Case		
No	Ref	-
Yes	1.7 (1.36-2.11)	< 0.001

[a]Odds Ratio.
[b]Inflammatory Bowel Disease.
[c]Body Mass Index.
[d]Current smoker within one year.
[e]Hypertension Requiring Medication + history of severe COPD + ascites within 30 days prior to surgery + CHF in 30 days before surgery + Diabetes Mellitus Requiring Therapy with Non-Insulin Agents or Insulin + CKD + disseminated cancer.
[f]>10% Loss of Body Weight in the 6 Months Prior to Surgery.

S874

Evaluation of Quality-of-Care Indicators Among Patients With Crohn's Disease and Ulcerative Colitis in the United States: 2019–2020

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Introduction: Crohn's disease (CD) and ulcerative colitis (UC) can be difficult to manage and, due to a lack of meaningful quality measures, patient (pt) care may vary by provider. To understand where gaps in care may exist for these pts, this study assessed specific healthcare resource utilization (HRU) and medication metrics that may be potential quality of care (QOC) indicators.
Methods: Using a large commercial US claims database (2019–2020), pts with CD or UC were identified. Potential QOC indicators were selected based on clinical guidelines and recommendations from measures of quality organizations and included CD or UC prevalence; gastroenterologist (GE) and IBD-related non-GE outpatient visits; IBD-related emergency department visits or hospitalizations; excessive steroid use (prednisone equivalent ≥10 mg/day for ≥60 consecutive days or a single prescription of ≥600 mg prednisone); excessive steroid users on corticosteroid (CS)-sparing therapy; excessive steroid users with central dual-energy X-ray absorptiometry (DEXA) or osteoporosis pharmacologic treatment; use of targeted immunomodulators (TIMs) and oral mesalamine (CD only); imaging assessments; and assessment of inflammatory biomarkers. National percentages of pts achieving each metric are reported.
Results: In total, 41,555 CD and 52,507 UC pts were identified in 2019, resulting in a 0.3% and 0.4% prevalence, respectively (Table). Over a third of CD pts (39.8%) and almost half of UC pts (45.5%) did not visit a GE in 2019. Around 10% CD pts, and up to 6.4% of UC pts, had IBD-related ED visits or hospitalizations. 17.1% CD and 14.5% UC pts were excessive steroid users, yet < 9% CD and UC pts, received

DEXA scans and/or bone treatments. A third of excessive steroid users with CD (34.5%), and over half (53.0%) of those with UC, did not receive CS-sparing therapy. The rate of TIM use was over two times higher in CD vs UC pts (CD: 44.3%; UC: 18.9%). Despite evidence that mesalamine is ineffective in CD, 18.7% of pts with CD were prescribed it. Inflammatory biomarker level testing rates were < 50% in both CD and UC. Similar outcomes were reported in 2020, with lower HRU, possibly due to COVID-19.
Conclusion: This analysis of QOC indicators highlights various areas for improvement that may provide better treatment outcomes and reduce HRU for pts with CD and UC. Future research is needed to assess outcomes in pts that are not being routinely monitored.

Table 1. Proportion of CD and UC patients achieving potential QOC metrics by year

Indicator	2019		2020	
	CD N=41,555[a]	UC N=52,507[a]	CD N=39,025[a]	UC N=47,940[a]
Diagnosis Rate	0.3%	0.4%	0.3%	0.4%
GE Outpatient Visits	60.2%	54.5%	57.5%	52.9%
IBD-Related Non-GE Outpatient Visit	38.5%	43.8%	41.3%	45.6%
IBD-related ED Visits	11.2%	4.7%	9.9%	4.5%
IBD-related Hospitalizations	10.3%	6.4%	9.1%	5.9%
Excessive Steroid Use[b] Corticosteroid-Sparing Therapy[c,d] DEXA or Bone Treatment[c,e,f]	17.1% 65.5% 8.9%	14.5% 47.0% 7.9%	15.8% 66.9% 8.0%	14.5% 49.4% 6.9%
Targeted Immunomodulator Use	44.3%	18.9%	48.4%	22.2%
Oral Mesalamine[g]	18.7%	N/A	17.0%	N/A
Imaging[h]	59.4%	64.2%	54.0%	58.0%
Inflammatory Biomarkers[i]	49.8%	35.8%	49.9%	36.9%

a) Sample size shown is based on continuous eligibility in medical benefit. Denominator for medication use outcomes focused on patients fully enrolled in both medical and pharmacy benefit, and thus were a subset of the larger population. b) Excessive steroid use was defined as doses ≥10 mg/day prednisone equivalent for ≥60 consecutive days or a single prescription of ≥600 mg prednisone. c) In excessive steroid users only. d) Treatments included thiopurine, methotrexate, or TIMs. e) All indicators were within the respective calendar year except DEXA/bone treatments that occurred during the prior calendar year. f) Defined as prescription osteoporosis treatment, excluding vitamin and mineral supplements. g) In patients with CD only. h) Including endoscopy, CT scan, MRI, or ultrasound. i) Including fecal calprotectin and c-reactive protein. CD, Crohn's disease; CT, computed tomography; DEXA, dual-energy X-ray absorptiometry; ED, emergency department; GE, gastroenterologist; IBD, inflammatory bowel disease; TIM, targeted immunomodulator; UC, ulcerative colitis.

S875

Assessment of Inflammatory Bowel Disease Training Among Gastroenterology Fellows

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Introduction: The management of inflammatory bowel disease (IBD) is rapidly changing with the expansion of approved therapeutic agents and evolving treatment paradigms. We aimed to assess confidence and training in IBD among gastroenterology (GI) fellows
Methods: This was a multicenter survey study of US GI fellows from December 2021-April 2022. The survey was voluntary, anonymous, and distributed electronically. The survey evaluated fellows' confidence level in IBD management (scale of 1-4; 1: not confident at all, 4: extremely confident), methods of IBD training received, and amount of additional training desired [None, A little (1 hour), A Moderate Amount (2-3 hours), A Lot (>3 hours)] in 20 core IBD domains. GI fellows' preferred learning method was evaluated.
Results: A total of 113 of 175 fellows (65%) from 17 GI fellowship programs responded to the survey. The respondents were distributed evenly between first, second and third year fellows (36.8% 28.7%, 33.3% respectively). Most fellows (85%) were training at academic institutions (55.2% had an IBD center). Confidence rating was low (not at all-to-slightly confident) in managing the pregnant patient with IBD (81.1%) followed by managing pouch disorders (78.9%) (Figure). Confidence scores were highest in managing the hospitalized patient with ulcerative colitis (82.1% moderately-extremely confident). More than 50% of 3rd year fellows reported low confidence in managing the pregnant patient, pouch disorders, extraintestinal manifestations (EIMs), postoperative Crohn's disease (CD) and counseling patients on small molecules. Fellows reported receiving no IBD specific training in managing the elderly patient (23.0%), EIMs (12.6%) and diet/nutrition counseling (12.5%). Most fellows (64.4%-68.9%) desired a moderate to a lot more training (≥ 2 hours) in: therapeutic drug monitoring, managing the patient with IBD failing first line biologic therapy, counseling patients on biologics/small molecules, managing the elderly patient, perianal CD, EIMs and pouch disorders. Recorded web-based lecture was ranked as the number one preferred learning strategy by 25.7% followed by live case-based lecture (23%) and live didactic lecture (23%).
Conclusion: Most GI fellows lacked confidence and training in key domains of IBD management. This may result in significant implications on the quality of IBD care. A focused and sustainable curriculum for GI fellows addressing the identified gaps of knowledge in IBD management is warranted.

[0875] **Figure 1.** GI fellows level of confidence in inflammatory bowel disease domains.

S876

Efficacy of Deucravacitinib, an Oral, Selective, TYK2 Inhibitor, in Patients With Moderately to Severely Active Ulcerative Colitis and Prior Exposure to Biologic Therapy: Subanalysis From the Phase 2 LATTICE-UC Study

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Introduction: Deucravacitinib (DEUC) is an oral, selective, allosteric inhibitor of tyrosine kinase 2 (TYK2), which mediates signaling of key cytokines in UC pathogenesis. In a phase 2 trial of DEUC in moderate to severe active UC, the primary endpoint was not met; however, a treatment effect was observed in patients with prior exposure to ≥1 biologic agent.
Methods: LATTICE-UC (NCT03934216), a double-blind phase 2 trial, randomized patients with moderate to severe active UC (modified Mayo score [MMS] 5-9 with endoscopic score [MES] ≥2, rectal bleeding score [RBS] ≥1, stool frequency score [SFS] ≥2) 2:1 to DEUC 6 mg or placebo (PBO) twice daily (BID). This post-hoc analysis in biologic-exposed patients assessed clinical remission (MMS ≤2, with SFS ≤1, RBS=0, MES ≤1); clinical response (decrease from baseline [BL] in MMS ≥2 points and ≥30% with decrease in RBS ≥1 point or absolute RBS ≤1); endoscopic improvement (MES ≤1); and change from BL (CFB) in symptomatic Mayo score (RBS + SFS). Colonic tissue transcriptomes were assessed via bulk RNA sequencing in a subset of biologic-exposed patients (DEUC n=17; PBO n=9). Differential expression with limma-voom and pathway enrichment analysis via Gene Set Enrichment Analysis were performed.
Results: Of 131 patients randomized, 48 (36.6%) were biologic-exposed (DEUC, 32/88 [36.4%]; PBO, 16/43 [37.2%]). At week 12, higher response rates were seen in patients receiving DEUC vs PBO in clinical remission (16.1% vs 0.0%), clinical response (29.0% vs 12.5%), and endoscopic improvement (25.8% vs 12.5%). Greater mean CFB in symptomatic Mayo score was observed at week 12 with DEUC (-2.1) vs PBO (-0.1) (Table). Type I interferon (IFN)–regulated genes (IRG) were significantly reduced in colonic tissues at week 12 compared to BL in DEUC (FDR < 0.1) but not in PBO. Pathway enrichment analysis confirmed that the IFN pathway was down-regulated with DEUC treatment. In patients receiving DEUC who achieved clinical response at week 12, IRG expression was reduced compared with nonresponders; similar trends were seen in clinical remitters and in endoscopic improvers.
Conclusion: Biologic-exposed patients treated with DEUC had greater improvements in clinical outcomes compared to PBO and had greater decreases in colonic IRG. The biomarker decreases were associated with clinical response or remission, suggesting inhibition of TYK2 pathways may be beneficial for UC. These results provide evidence the target was engaged and suggest a higher dose may have greater efficacy.

Table 1. Clinical Endpoints at Week 12 in Bio-Exposed Patients

Endpoint	Deucravacitinib 6 mg BID (n = 31)	Placebo (n = 16)
Clinical remission response rate, mean	16.1%	0.0%
Clinical response rate, mean	29.0%	12.5%
Endoscopic improvement response rate, mean	25.8%	12.5%
Symptomatic Mayo score, mean change from baseline (a)	-2.1%	-0.1

Table: (a) n for deucravacitinib and placebo is 16 and 9, respectively. BID, twice daily.

S877

Smoking Adversely Impacts Therapeutic Response to Treatment in IBD Patients

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Introduction: Smoking is associated with a reduced ability to induce short-term clinical response and remission in Crohn's patients using biologics. Few studies have investigated the impact of smoking on therapeutic response of Inflammatory Bowel Disease (IBD) treatments using biologics only, but none have considered impact of smoking using biologics, immunomodulators or both. The aim of this study is to assess the utility of C-Reactive Protein (CRP)/albumin ratio in measuring treatment response in all IBD patients in relation to smoking status.
Methods: Retrospective analysis was performed on adults (>18 years old) with an ICD-9/10 code diagnosis of Crohn's or UC disease during their index hospitalization for IBD flare to a tertiary care center between January 1st 2013 to June 1st 2017. Non-consented patients were excluded. Treatment during index hospitalization was documented as either using biologics, immunomodulators or both. Inflammation status to measure treatment response was assessed using CRP /albumin ratio. Smoking status was defined as ever or never smoker.
Results: Out of 1101 IBD patients, 418 patients had a documented smoking status and a calculable CRP/Albumin ratio; 168 (40.2%) were ever smokers and 250 (59.8%) were never smokers. Among never-smoker IBD, Crohn's and UC patients, those who received biologics, immunomodulators or both had a lower mean CRP/Albumin ratio than those who did not (Table). Never-smoker IBD and UC patients who used biologics, had statistically significant lower mean CRP/Albumin ratio than those who did not, (p=0.010 and p=0.006, respectively). Among majority of ever-smoker IBD, Crohn's and UC patients, those who received biologics, immunomodulators or both had a higher mean CRP/Albumin ratio than those who did not (Table). Ever-smoker IBD and UC patients who used immunomodulators and biologics, had statistically significant higher mean CRP/Albumin ratio than those who did not, (p=0.026 and p=0.041, respectively).
Conclusion: Smoking is associated with worsening therapeutic response to treatments in all IBD, Crohn's and UC patients, with an amplified effect when both immunomodulators and biologics are used. On the other hand, regardless of type of therapy received, never-smokers have an improved response to treatment in all IBD, Crohn's and UC patients. Further investigation is warranted to understand the interaction of smoking with IBD treatment at the biochemical level in the light of disease progression.

Table 1. Treatment Response in IBD Patients who are Ever vs. Never Smokers using CRP/Albumin Ratio as an Indicator

	All IBD N(mean)	P-value	Crohn's N(mean)	P-value	Ulcerative Colitis N(mean)	P-value	Treatments
Never Smokers	119 (14.41)	102 (14.5)	16 (14.3)				Biologics
	66 (23.7)	0.010	28 (31.9)	0.006	37 (18.1)	0.56	No Biologics
	105 (17.30)	75 (17.8)	28 (17.0)				Immunomodulators
	80 (18.29)	0.78	55 (18.9)	0.79	25 (16.8)	0.97	No Immunomodulators
	73(14.97)	61 (15.4)	11 (13.4)				Both
	112(19.53)	0.20	69(20.8)	0.21	42 (17.9)	0.54	None
Ever Smokers							Biologics
							No Biologics
							Immunomodulators
							No Immunomodulators
							Both
							None

Number of patients (N) and their affiliated mean CRP/Albumin ratios (mean) and p-values are reported above. Biologics were defined as infliximab, adalimumab, golimumab, vedolizumab, natalizumab, certolizumab, ustekinumab or tofacitinib. Immunomodulators were defined as azathioprine, methotrexate, tacrolimus, 6-mercaptopurine, mesalamine or sulfasalazine.

S878

Fecal Calprotectin Level Is Nonlinearly Associated With GI Pathogen Detection by PCR in Patients With and Without Inflammatory Bowel Disease

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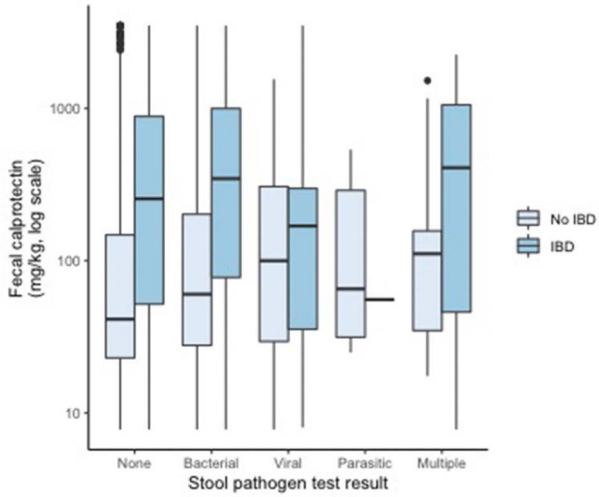
Introduction: Fecal calprotectin (FCP) is an inflammatory marker frequently used to monitor inflammatory bowel disease (IBD) activity, but it can also be elevated in gastrointestinal infections. The impact of infections on FCP level in people with IBD has not been well described across pathogens. The objective of our study was to quantify the relationship between FCP levels and lab-confirmed infections in people with and without IBD.

Methods: We performed a retrospective cohort study at a tertiary-care referral center of inpatient and outpatient encounters during which FCR and gastrointestinal pathogen polymerase-chain reaction (GI PCR) testing were conducted. Using non-parametric tests and quantile regression, we compared FCP levels between individuals with and without IBD and with and without pathogen detection.

Results: There were 3,399 encounters with FCP and GI PCR testing from 2,780 unique individuals between August 1, 2016 and February 17, 2022. Overall, 1819 (53.5%) encounters were individuals with IBD (n=1,819, Table). Pathogens were detected in 757 encounters (22.3%). There was no significant difference in pathogen detection or pathogen type between groups with and without IBD (p >0.9). The median FCP was 46 mg/kg in individuals without IBD and 265 mg/kg in those with IBD (p< 0.001). Among individuals without IBD, the median FCP was significantly elevated when a pathogen was detected (64 vs. 41 mg/kg, p=0.0003, Figure), but FCP was not significantly elevated among those with IBD when a pathogen was detected (299 vs. 255 mg/kg, p=0.207). After adjusting for age and IBD status in quantile regression, pathogen detection was only significantly associated with higher FCP in the lower two quartiles, though IBD remained significantly associated with higher FCP at all levels (p >0.001). After adjusting for IBD and age, FCP was significantly associated with detection of bacterial pathogens and multiple pathogens in the lower two quartiles.

Conclusion: Pathogen detection by GI PCR is associated with elevated FCP, though this relationship is nonlinear and varies by IBD status. Even after stratifying by IBD status, there is significant variability in FCP, suggesting that factors in addition to infection may be playing a role, including potentially measurement error, or a greater immune reaction to pathogen infection in IBD leading to mild flares. Our findings indicate that FCP may be an adjunct to, but not a substitute for stool pathogen testing.



[0878] **Figure 1.** Fecal calprotectin levels by stool pathogen testing result and inflammatory bowel disease (IBD) diagnosis

Table 1. Characteristics of patients with and without IBD who had fecal calprotectin and gastrointestinal pathogen testing

Variable	Overall N = 3,347[1]	IBD diagnosis		p-value[2]
		No IBD N = 1,528[1]	IBD N = 1,819[1]	
Fecal calprotectin (mg/kg)	107 (31, 498)	46 (24, 168)	265 (56, 903)	< 0.001
Pathogen detected	744 (22%)	340 (22%)	404 (22%)	>0.99
Age (years)	39 (25, 57)	41 (23, 61)	38 (26, 55)	0.02
Sex				< 0.001
Female	2,013 (60%)	988 (65%)	1,025 (56%)	
Male	1,333 (40%)	540 (35%)	793 (44%)	
Race				0.13
African American	332 (9.9%)	135 (8.8%)	197 (11%)	
American Indian or Alaska Native	5 (0.1%)	3 (0.2%)	2 (0.1%)	
Asian	92 (2.8%)	51 (3.3%)	41 (2.3%)	
Caucasian	2,768 (83%)	1,277 (84%)	1,491 (82%)	
Native Hawaiian and Other Pacific Islander	1 (< 0.1%)	1 (< 0.1%)	0 (0%)	
Other	113 (3.4%)	49 (3.2%)	64 (3.5%)	
Patient Refused	18 (0.5%)	5 (0.3%)	13 (0.7%)	
Unknown	16 (0.5%)	7 (0.5%)	9 (0.5%)	
Ethnicity				0.35
Hispanic or Latino	89 (2.7%)	49 (3.2%)	40 (2.2%)	
Non-Hispanic or Latino	3,193 (96%)	1,449 (95%)	1,744 (96%)	
Patient Refused	22 (0.7%)	10 (0.7%)	12 (0.7%)	
Unknown	39 (1.2%)	18 (1.2%)	21 (1.2%)	
Inpatient encounter	1,435 (43%)	523 (34%)	912 (50%)	< 0.001

1 Median (IQR); n (%) ; 2 Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test.

S879

IL12/23 Blockade for Refractory Immune-Mediated Colitis: A Case Series From Two Centers

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Introduction: Ustekinumab, a human monoclonal antibody to the interleukin (IL) 12/23 p40 subunit, is efficacious in the management of severe inflammatory bowel disease (IBD). Immune-mediated colitis (IMC) is a common immune checkpoint inhibitors (ICIs) toxicity that is similar to IBD. Robust data on optimal evidence-based management of IMC is lacking, and current medical therapy includes steroids, followed by infliximab (IFX) and/or vedolizumab (VDZ). Fecal microbiota transplantation (FMT) is used for colitis refractory to aforementioned therapies. To explore the efficacy of ustekinumab in managing refractory IMC, we present a case series of 19 patients who developed IMC and were treated with the same.
Methods: This is a retrospective chart review of cancer patients from two tertiary care centers who received ICI therapy and developed IMC refractory to standard of care treatments and were treated with ustekinumab. Clinical remission is defined as improvement in IMC grade to ≤ 1, and response as any improvement in GI symptoms.
Results: Of 19 patients in our cohort, the majority were Caucasians females with a median age of 63 years. The most common cancer type was melanoma (52.7%). Nine (47%) patients had received combination CTLA-4/PD-1 regimens prior to onset of IMC. Most (84.2%) patients had grade ≥3 diarrhea and 42.1% had ulcerative inflammation. All patients' IMC remained clinically refractory to systemic steroids and IFX and/or VDZ, prompting initiation of ustekinumab. 13 (68.4%) improved following ustekinumab. Sixteen patients (84.2%) had clinical remission at last follow up. Eight patients in our cohort received FMT, 4 before and 4 after ustekinumab, six of whom improved after ustekinumab. (Table)
Conclusion: IMC can be refractory to multiple lines of therapy including corticosteroids, IFX, VDZ, or FMT. IL12/23 inflammatory pathway may serve as a therapeutic target in managing such cases. The majority of patients in our case series had improvement in their IMC symptoms following ustekinumab, and only one patient experienced an adverse event. This result shows promise for the use of IL12/23 antagonists in the management of refractory IMC case, but further studies are still needed to validate its use.

Table 1.

Characteristic	Data (N=19)
Highest grade of diarrhea (3-4) – no. (%)	16 (84.2%)
Highest grade of colitis (2-4) – no. (%)	13 (68.3%)
Initial endoscopic findings—no (%)	
Ulcers	8 (42.1%)
Non-ulcer inflammation	5 (26.3%)
Normal	6 (31.6%)
Hospitalizations – no. (%)	14 (73.7%)
Other treatment of GI adverse event – no. (%)	
Steroid	19 (100%)
Infliximab	11 (57.9%)
Vedolizumab	18 (94.7%)
FMT	8 (42.1%)
Number of ustekinumab doses, median (IQR)	2 (10.5%)
1 dose of ustekinumab	7 (36.8%)
>1 dose of ustekinumab	12 (63.2%)
Clinical remission following ustekinumab treatment –no (%)	13 (68.4%)
Clinical remission of colitis at last follow-up - n=19	16 (84.2%)

S880

Treatment Failure and Clinical Response Differences in Fixed-Dosing versus Weight-Adjusted Anti-TNF Therapy in Obese Patients With Ulcerative Colitis

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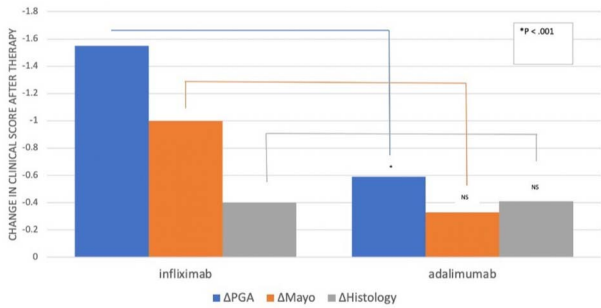
Introduction: Obesity (BMI ≥30 kg/m^2) in patients with ulcerative colitis (UC) is associated with an increased risk of treatment failure, hospitalization, and surgery. Pharmacokinetic studies of biologic therapies used to treat inflammatory bowel disease (IBD) have shown that higher BMI is associated with increased clearance and lower drug concentrations. Direct comparisons between fixed-dosing and weight-adjusted anti-tumor necrosis factor (anti-TNF) therapies are limited. We aimed to compare the rate of treatment failure and clinical response of fixed-dosing adalimumab (ADA) versus weight-based infliximab (IFX) in obese patients with UC.
Methods: This was a single-center, retrospective cohort study of obese patients aged 18–75 years old with UC who initiated treatment with fixed-dosing ADA or weight-based IFX, per standard induction and maintenance dosing regimens, from January 2015 – December 2020. Patient characteristics including sex, age, BMI, disease duration and extent, serologic markers of inflammation, and concurrent medications were extracted from the electronic health record. Disease severity before and after anti-TNF therapy was assessed using the physician global assessment (PGA) score (0–3, 0=normal, 3=severe disease) based on clinical status during clinic visits, endoscopic Mayo scores and histologic disease severity. The primary outcome was rate of treatment failure (i.e., lack of clinical response, need for colectomy, or change in biologic therapy).
Results: Eighty-nine patients were identified (Table). The rate of treatment failure was greater in those on ADA than IFX, although without statistical significance (53% vs 34%, p=0.079). Based on PGA score, those treated with IFX were more likely to have clinical improvement than ADA (-1.55 ± 0.95 vs -0.59 ± 0.92, p< 0.001) (Figure). Using multivariate logistic regression analysis, ADA was associated with an increased risk of treatment failure (OR 3.02, p=0.03).
Conclusion: We found that fixed-dosing ADA, compared to weight-based IFX, appears to be associated with worse clinical outcomes and higher risk of treatment failure in obese patients with UC. Due to the pharmacokinetics of increased drug clearance seen with greater BMI, weight-based dosing regimens of anti-TNF therapies may be more effective in such patients. Prospective studies with drug level testing are needed to further evaluate the impact of obesity on treatment response to anti-TNF therapies in IBD.



[0880] **Figure 1.** Infliximab vs Adalimumab on Clinical Outcome Measures. Abbreviations: change in (Δ), physician global assessment score (PGA), endoscopic Mayo score (Mayo), histologic disease severity (Histology), not significant (NS)

Table 1. Patient Characteristics Prior to Initiation of Biology Therapy

	Adalimumab (n=51)	Infliximab (n=38)	p-value
Gender (male), n (%)	30 (59%)	18 (47%)	0.284
Age, mean	48.9	42.8	0.054
BMI, mean	34.7	35	0.71
Race (caucasian), n (%)	49 (96%)	34 (89%)	0.138
Hypertension, n (%)	20 (39%)	7 (18%)	0.035
Hyperlipidemia, n (%)	16 (31%)	6 (16%)	0.092
Type 2 diabetes mellitus, n (%)	8 (16%)	3 (8%)	0.269
Prior IBD surgery, n (%)	0 (0%)	1 (3%)	0.244
Prior anti-TNF therapy, n (%)	8 (16%)	20 (53%)	< 0.001
Hospitalization (last 6 mo), n (%)	10 (20%)	21 (55%)	< 0.001
Current steroid use, n (%)	35 (69%)	30 (79%)	0.278
Inpatient initiation, n (%)	0 (0%)	16 (42%)	< 0.001
Initial CRP, mean (mcg/ml)	1	4.9	0.003
Initial ESR, mean (mm/hr)	12	39	0.008
Initial calprotectin, mean (mcg/mg)	322.8	1250	0.035
Initial hemoglobin, mean (g/dl)	13.4	11.7	0.002
Initial PGA score, mean	2.24	2.68	0.001
Initial endoscopic Mayo score, mean	1.95	2.4	0.005
Initial histologic severity, mean	1.95	2.2	0.124

"Initial" refers to value of cited variable prior to biologic initiation.
Abbreviations: inflammatory bowel disease (IBD), anti-tumor necrosis factor (anti-TNF), months (mo), physician global assessment (PGA).

S881

Ustekinumab Therapeutic Drug Monitoring in Inflammatory Bowel Disease

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Introduction: In the setting of inflammatory bowel disease (IBD), therapeutic drug monitoring (TDM) is a commonly used clinical tool to guide anti-TNF therapy; however, the use of TDM for ustekinumab (UST) has yet to be fully defined. The goal of this study is to analyze possible correlations between UST drug levels and patient characteristics, disease activity, and clinical outcomes in a population of both Crohn's disease (CD) and ulcerative colitis (UC) patients.
Methods: A retrospective cohort study was performed for IBD patients who had UST trough levels drawn at maintenance dosing. In addition to trough levels, other data collected include patient demographics, such as age, gender, BMI, therapy management, such as dosing schedule, concurrent drug therapies, and previously failed biologics, and treatment outcomes, such as laboratory biomarkers, clinical scores, and endoscopy scores.
Results: The population of 177 IBD patients had an average UST trough level of 4.742 μg/mL without antibody development in any patient. Higher frequency dosing schedules (i.e. Q4, Q6) were significantly associated ($p < 0.001$) with increased UST trough levels compared to standard (Q8 week) maintenance dosing. Patient demographics, including age, gender, ethnicity, and BMI did not correlate with trough levels. Furthermore, disease duration, subtype, location, and phenotype did not show a significant difference in UST trough levels. Naiveté to anti-TNFs correlated with higher UST titer levels ($p=0.048$) with 67% adequate UST titer for anti-TNF naïve patients vs 48% for those with previous exposure to anti-TNFs. A higher erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were significantly related to lower UST titer levels ($p=0.002$ and $p=0.005$, respectively). HBI for CD and Mayo Score and UCAI for UC failed to show significance to titer levels. Mayo and Rutgeerts endoscopic scores did not correlate with titer levels, but lower SES-CD correlated with adequate titer levels ($p=0.018$). (Table)
Conclusion: Furthermore, prior anti-TNF exposure was associated with lower UST levels, which suggests a possible advantage of prescribing UST for biologically naïve patients. Overall, higher UST drug levels correlated with lower SES-CD scores and ESR and CRP levels, indicating decreased inflammation. Based on these findings, therapeutic drug monitoring of UST trough levels and corresponding dosing schedule adjustments to reach target levels may ensure more adequate response from UST therapy.

Table 1. Inflammatory markers, Endoscopy, biologic, and corticosteroid exposure relationship to ustekinumab trough levels

	Adequate Ustekinumab levels	Low Ustekinumab levels	Total N	Statistical Test	p-value
Inflammatory Markers					
ESR (mm/hour)	10.93 (N=60)	22.48 (N=54)	114	t-test	**0.002**

Table 1. (*continued*)

	Adequate Ustekinumab levels	Low Ustekinumab levels	Total N	Statistical Test	p-value
CRP (mg/L)	6.44 (N=62)	17.18 (N=55)	117	t-test	**0.005**
Albumin (g/dL)	4.20 (N=59)	4.03 (N=42)	101	t-test	0.182
Fecal Calprotectin (μg/g)	511.67 (N=9)	1105.13 (N=8)	17	t-test	0.160
Combined Labs (# of patients)					
Lab Flare	17	27	125	χ^2	**0.011**
Lab Remission	55	34			
Endoscopy					
Mayo Endoscopy	3 (N=2)	1.5 (N=2)	4	t-test	0.095
SES-CD	1.5 (N=4)	8.5 (N=4)	8	t-test	**0.018**
Anti-TNF					
Anti-TNF Exposure	68	73	177	χ^2	**0.048**
Anti-TNF Naive	24	12			
Infliximab					
Infliximab Exposure	27	48	177	χ^2	**0.006**
Infliximab Naïve	58	44			
Adalimumab					
Adalimumab Exposure	46	37	177	χ^2	0.388
Adalimumab Naive	46	48			
Certolizumab					
Certolizumab Exposure	13	24	177	χ^2	**0.021**
Certolizumab Naive	79	61			
Golimumab					
Golimumab Exposure	2	6	177	χ^2	
Fisher exact (two-sided)	0.118				
0.156					
Golimumab Naive	90	79			
Prednisone (#of patients)					
Concomitant Prednisone	4	12	177	χ^2	
Fisher exact (two-sided)	**0.024**				
0.034					
No Prednisone	73	88			

S882

Characteristics, Treatment and Outcome of Patients With Bowel Perforation After Immune Checkpoint Inhibitor Exposure

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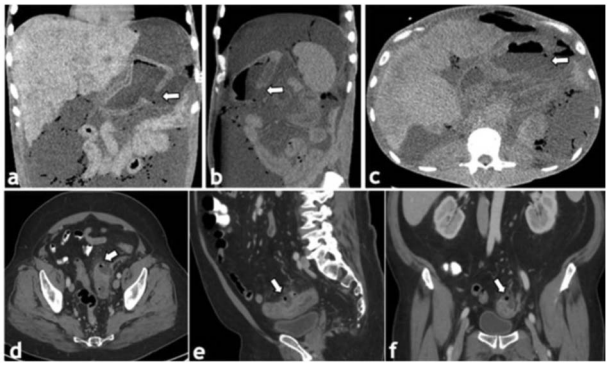
Introduction: Exposure to immune checkpoint inhibitors (ICI) can predispose to immune-related adverse events (irAE) involving the gastrointestinal tract. The association between ICI and bowel perforation has yet to be elucidated. We aim to describe the clinical course, complications, treatment and outcomes of patients with bowel perforation on ICI therapy.
Methods: This is a retrospective study of adult cancer patients with bowel perforation that occurred between the first dose of ICI treatment and up to 2 years thereafter, at MD Anderson Cancer Center between 1/1/2010 and 4/30/2021. Patients' clinical courses, imaging, treatment and outcomes related to bowel perforation were collected and analyzed. (Figure)
Results: Of the 13,991 patients that received ICIs in the study period, 90 (0.6%) inclusion criteria . A majority of our sample were male (54.4%) with melanoma cancer type (23.3%), and PD-1/L1 inhibitor treatment exposure (58.8%). Onset of perforation usually occurred after a median of 4 ICI treatment cycles. The most common symptom was abdominal pain (95.5%) followed by abdominal guarding (20%) and fever (16.6%). The colon was the most common location for the perforation (37.7%) followed by small bowel (30%), and rarely the stomach. Twenty-eight patients (31%) had evidence of of enterocolitis, diverticulitis, appendicitis and 6 (6.6%) patients had luminal cancer involvement at the time of perforation. Overall hospitalization rate related to perforation was 95.5% with mortality of 15.5% on the same admission. 95% of our sample received antibiotics with 38% of patients requiring surgery or a procedure by interventional radiology. Forty-six patients (51.1%) had perforation related complications (such as sepsis, fistula, abscess), which was associated with higher mortality rate of 30%. (Table)
Conclusion: Bowel perforation after ICI treatment has not been well-studied. Our findings suggest the low incidence of 0.6%, with 40% patients having co-existing bowel abnormalities as the potential contributing factor. Patients with bowel perforation had aggressive disease course, high rate of hospitalization, complications, and mortality. Early recognition and prompt intervention is critical to improve the patients' outcome. Future studies are still warranted to further investigate the cause, predictive markers and optimal treatment for this patient population.



[0882] **Figure 1.** A–C; CT images with stomach perforation after initiation of ICI C–E; CT Images with colonic contained microperforation

Table 1. Perforation-related characteristics of patients treated with ICIs (n=90)

Characteristic	No. of patients (%)
Median overall duration of ICI treatment before perforation, cycles (IQR), n=90	4 (2-7)
History of perforation before ICI	0 (0)
Previous history of bowel disorders	0 (0)
Clinical symptoms	
Abdominal pain	86 (95.5)
Guarding	18 (20)
Fever	15 (16.6)
Perforation distribution	
Colon	34 (37.7)
Small bowel	27 (30)
Stomach	2 (2.2)
Esophageal	0 (0)
Appendix	11 (12.2)
Potential reasons for perforation	
Active inflammation of the gut	28 (31)
Infection of the gut	0 (0)
Cancer involvement	6 (6.6)
Iatrogenic (surgery, or IR or scope)*	2 (2.2)
Co-existing bowel condition at the time of perforation	
Diverticulitis	21 (23.3)
Appendicitis	4 (4.3)
Enterocolitis	7 (7.7)
Micro-perforation or contained perforation on imaging	4 (4.3)
Complication of perforation, no. (%)	
Fistula	3 (3.3)
Abscess	10 (11.1)
Free air	15 (16.6)
Sepsis	35 (38.8)
Treatment, no. (%)	
No treatment	0 (0)
Antibiotics	86 (95.5)
Antibiotics plus surgery	20 (22.2)
Antibiotics plus IR procedure	14 (15.5)
Cancer treatment after ICI termination, no. (%)	19 (21.1)
No further cancer treatment	71 (78.8)

Table 1. (*continued*)

Characteristic	No. of patients (%)
Continued with ICI treatment	11 (57.8)
Switched to other non-ICI treatment	8 (42.1)
Outcomes	
Hospitalization, no. (%)	86 (95.5)
Days of hospitalization, median (IQR), n=86	7 (5-15)
Death on the same admission	14 (15.5)
All-cause mortality	71 (78.8)

ICI: immune checkpoint inhibitor, IQR: interquartile range, IR: interventional radiology, mo.: months, SD: standard deviation.
Footnote: Treatment option: 4 patients (4.3%) underwent both IR procedure (drainage) and Surgery at a later date.

S883

Impact of Fatigue on Work Productivity and Activity Impairment and Health Care Utilization in Patients With Inflammatory Bowel Disease

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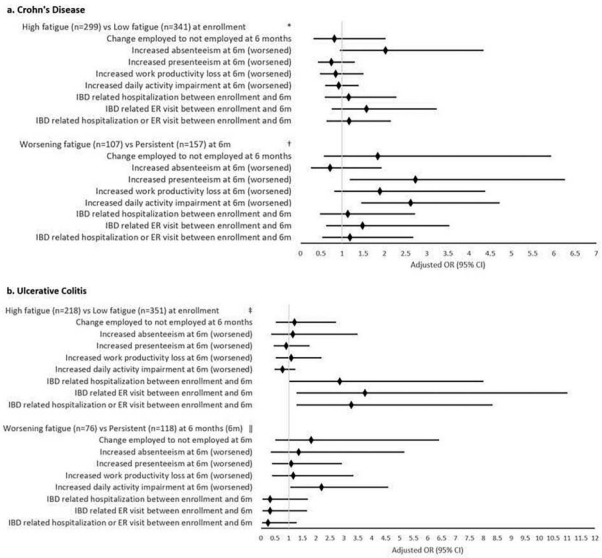
Introduction: Fatigue often impacts daily activities in patients with IBD and is commonly reported even in patients with inactive disease. We explored the impact of fatigue on work productivity and activity impairment (WPAI) and health care utilization (HCU).
Methods: Data were analyzed from the CorEvitas IBD Registry, a prospective cohort of adult patients with Crohn's Disease (CD) or ulcerative colitis (UC). Using data collected between May 3, 2017 and April 1, 2022, we compared WPAI and HCU among 1) subjects with high fatigue (PROMIS score > 55) vs low fatigue (PROMIS score < 55) at enrollment and 2) subjects whose fatigue score worsened vs subjects with persistently high fatigue at 6 months. Disease activity was assessed with Harvey Bradshaw Index (CD) or Partial Mayo (UC). Descriptive statistics, adjusted odds ratios and 95% CIs are reported.
Results: High fatigue at enrollment was reported in 47% of 640 CD and 38% of 569 UC patients with 56% and 39% in remission, respectively. For both CD and UC, patients with high fatigue reported more absenteeism, presenteeism, work productivity loss, and daily activity impairment, and higher rates of HCU at enrollment compared to those with low fatigue (Table). In adjusted analyses, 17% of CD subjects had worsened fatigue at 6 months which correlated with 2.7 increased odds of worsening presenteeism (95% CI: 1.19-6.26) and a 2.6 increased odds of worsening daily activity impairment (95% CI 1.45-4.72) compared to those with persistently high fatigue (Figure a). For UC, high fatigue correlated with 2.9 increased odds of an IBD-related hospitalization (95% CI 1.02-7.99) and 3.8 increased odds of having an ER visit (95% CI 1.28-11.01) in the following 6 months. Further, 13% of UC subjects had worsened fatigue at 6 months and were found to have 2.2 increased odds of worsening daily activity impairment (95% CI 1.06-4.59) compared to those with persistently high fatigue (Figure b).
Conclusion: Our data show that fatigue is prevalent in both CD and UC and persists in the absence of active inflammation. More severe fatigue is associated with concurrent work productivity and activity impairment in both UC and CD patients and more IBD-related HCU in the UC subjects. Treatment approaches that improve fatigue in our IBD population may help to lessen further disability.



[0883] **Figure 1.** Adjusted Association Between Worsening Fatigue vs Persistently High Fatigue at 6 Months and Change in Employment, Work Productivity and Activity Impairment, and Health Care Utilization at 6 Months in Patients with Crohn's Disease or Ulcerative Colitis * Adjusted odds ratios were obtained using logistic regression models adjusted for age, sex, education, marital status, current alcohol use, history of CVD, history of respiratory, history of depression, history of anxiety, number of prior biologics/JAKi/S1P, concomitant steroids, duration of current IBD therapy, Harvey Bradshaw index score (continuous), and WPAI current employment † Adjusted odds ratios and p values were obtained using logistic regression models adjusted for age, sex, BMI continuous, private insurance, marital status, history of respiratory, history of anxiety, history of other non-serious medical condition, time since IBD diagnosis, prior IST experienced, prior steroid experienced, Harvey Bradshaw Index score (continuous), and WPAI current employment ‡ Adjusted odds ratios were obtained using logistic regression models adjusted for age, sex, smoking status, current alcohol use, history of CVD, history of depression, history of anxiety, history of other non-serious medical condition, pan-colitis, concomitant biologics/JAKi/S1P, concomitant 5-ASAs, duration of current IBD therapy (years), and Partial Mayo score (continuous) ‖ Adjusted odds ratios were obtained using logistic regression models adjusted for white race, Hispanic ethnicity, BMI categorical, smoking status, history of anxiety, history of other non-serious medical conditions, proctitis, pan-colitis, prior-antibiotic experienced, concomitant biologics/JAKi/S1P, concomitant 5-ASAs, and Partial Mayo score (continuous).

Table 1. Baseline Work Projectivity and Activity Impairment and Health Care Utilization Among Patients with Crohn's Disease or Ulcerative Colitis having High Fatigue (PROMIS score ≥ 55) versus Low Fatigue (PROMIS score < 55) at Enrollment

	High Fatigue	Low Fatigue	Unadjusted p value
Crohn's disease	n=299	n=341	
Absenteeism	45/169 (27%)	28/209 (13%)	0.001
Presenteeism	147/174 (85%)	113/222 (51%)	< 0.001
Work productivity loss	143/167 (86%)	112/208 (54%)	< 0.001
Daily activity impairment	255/298 (86%)	193/339 (57%)	< 0.001
IBD-related hospitalizations	206/299 (69%)	203/340 (60%)	0.016
IBD-related ER visits	193/299 (65%)	185/340 (54%)	0.009
Ulcerative Colitis	n=218	n=351	
Absenteeism	48/131 (37%)	23/215 (11%)	< 0001
Presenteeism	102/139 (73%)	120/232 (52%)	< 0001
Work productivity loss	99/130 (76%)	117/215 (54%)	< 0001
Daily activity impairment	176/217 (81%)	199/351 (57%)	< 0001
IBD-related hospitalizations	109/218 (50%)	144/351 (41%)	0.036
IBD-related ER visits	111/218 (51%)	132/350 (38%)	0.002

S884

Limited Representation of Patients With Crohn's Disease-Related Complications in Randomized Clinical Trials

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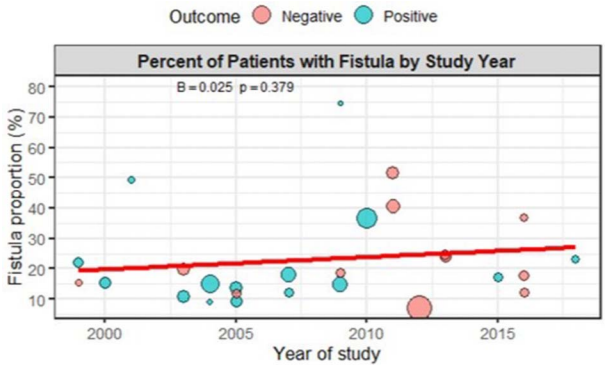
Introduction: Biologic therapies have become mainstays of treatment of Crohn's Disease (CD) patients. However, exclusion of patients with complications of CD from randomized controlled trials (RCTs) may limit generalizability of their findings to these subgroups. To address this, we conducted a systematic review of complication-related exclusion and inclusion criteria of primary CD-specific RCTs.
Methods: Trials were included if they had a primary efficacy outcome and evaluated a biologic medication against at least one different medication (not including different doses of same biologic). Articles with less than fifty patients with CD or secondary studies re-appraising data from trials were excluded.
Results: Sixty-seven articles met inclusion criteria. Included studies were published between 1997 and 2021. Many RCTs excluded patients with fistula, abscess, stricture, ostomy, CD-related surgery, short bowel syndrome or those requiring enteral feeding (Table). For the complications of fistula, abscess and CD-related surgery, more studies neither explicitly excluded patients with these complications nor included rates of these complications. Of all complications, patients with fistulas or CD-related surgery were best described, with data presented in 41.8% and 43.3% of studies, respectively. Three studies required fistulas for inclusion and two studies required CD-related surgery for inclusion. In the remaining studies presenting data on fistula and CD-related surgeries, average rates were 20.1% and 40.0% respectively. No temporal trends were observed for inclusion of patients with fistulas or CD-related surgeries.
Conclusion: Our results suggest that there is limited representation of patients with complications of CD in RCTs, specifically patients with abscesses, strictures/stenosis, ostomies, small-bowel syndrome, and those requiring enteral feeding. While efficacy measurement tools such as the Crohn's Disease Activity Index lose validity in patients with complications of IBD, efforts should be made to accommodate these subpopulations in clinical trials through methodologies such as stratification and propensity score matching. Studies that omit patients with complications from exclusion criteria should identify and present total numbers of patients with these complications in their text to enhance understanding of treatment for these subpopulations.



[0884] **Figure 1.** Percent of CD patients with fistulas included in biologic RCTs by study year. Studies were considered positive if they had signficiant findings in their primary efficacy outcome, and negative if their primary efficacy outcome was not significant

Table 1. Percentage of studies excluding, omitting, and presenting patients with IBD-related complications and average representation in those including patients with complications. Studies were considered to have excluded patients they were explicitly excluded in the manuscript reviewed, its supplemental methods or the clinical trial registration and it did not present any data on complication prevalence

	Excluded	Omitted	Data Present	Average (presented)[i]
Fistula	22.4	35.8	41.8	20.1
Abscess	46.2	52.2	3.0	20.0
Stricture	77.6	17.9	7.5	44.4
Ostomy	76.1	22.4	1.5	15.7
Small-Bowel Resections	28.3	NA	NA	NA
Colectomy	22.4	NA	NA	NA
CD-Related Surgery*	37.3	18.4	43.3	40.0
Short Bowel Syndrome	56.7	43.3	0	NA
Enteral Feeding	23.8	56.7	0	NA

*CD-Related Surgery included small-bowel resections or colectomy or both.
iAverages exclude any study that including only patients with listed complication.

S885

Inflammatory Bowel Disease Flare Outcomes After Corticosteroid Therapy: A Single Center Retrospective Analysis

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Introduction: In the pre-biologic era, population-based data from Olmsted County, MN (Faubion and colleagues) demonstrated high rates of corticosteroid persistence and colectomy for ulcerative colitis (UC) patients started on corticosteroid therapy. We present a single-center retrospective analysis in a racially diverse population to study their short and long-term outcomes following the administration of corticosteroids for UC among patients at high risk for colectomy who required admission along with the impact of sociodemographic and clinical factors on their outcomes.
Methods: We analyzed medical records of patients hospitalized for a UC flare to Montefiore Medical Center from January 1, 2015, until January 1, 2020, who were treated with systemic corticosteroids. Outcomes were measured as short term (30 days) or long term (1 year) following the admission. Demographic variables were abstracted. We identified patients at the short term that achieved complete clinical remission (total regression of clinical symptoms), partial remission (≤4 stools/day; blood, pus, mucus in feces; or abdominal pain, and no systemic symptoms), and no clinical response as defined in Faubion, et al. We also determined which patients were corticosteroid-free, corticosteroid persistent, and those who underwent colectomy due to active disease at 1-year. Independent variable association between 30 day and 1-year outcomes were assessed by multivariate logistic regression.
Results: 81 patients with UC were identified. Sociodemographic variables are shown in Figure. Overall, 68/81 (84%) achieved complete clinical remission, 9/81 (11%) partial remission, and 4/81 (5%) did not respond to systemic corticosteroids. 68/81 (84%) were corticosteroid-free at 1 year. 11/81 (13%) remained on corticosteroids, and 2/81 (3%) underwent colectomy at 1 year. Additionally, TNF alfa inhibitors (27%), and anti-integrins (15%) were started after or as the corticosteroids were discontinued. The multivariable analysis did not show any association between sociodemographic factors and outcomes of interest (Table).
Conclusion: Rates of corticosteroid persistence and colectomy are different than previously reported in the pre-biologic era with only 13% and 3% at 12 months respectively. Our results differ significantly from Faubion and colleagues suggesting overall changes in IBD care since that publication. No association was observed among racial/ethnicity, insurance type, and short and long-term outcomes of interest.

Sex	Male	43%
	Female	57%
Age (mean)		41.1 years
Race/Ethnicity	African American	24%
	White	21%
	Asian	2%
	Hispanic	37%
	Other	1%
	Unknown	12%
	Native American	3%
Location of the disease	Pancolitis	53%
	Left sided colitis	35%
	Proctitis	11%
Medication used at index event	None	58%
	ASA-5	26%
	Sulfasalazine	6%
	Budesonide	4%
	TNF alfa inhibitors	1%
	Thiopurines	4%
	Other	1%
History of bowel resection	Yes	2%
	None	98%
Insurance type	Medicaid	41%
	Medicare	26%
	Private	33%
Type of steroid use	Prednisone (PO)	89%
	Methylprednisolone (IV)	11%
Reason for use of corticosteroid other than IBD flare	No	90%
	Yes	10%
Type of biologic started after corticosteroids	TNF alfa inhibitor	27%
	Integrin receptor antagonist	15%
TNF alfa inhibitor	Infliximab	21%
	Adalimumab	6%
Integrin receptor antagonist	Vedolizumab	15%
Time from index event to biologic start date	1 month	11%
	1- 6 months	25%
	>6-12 months	4%
	> 1 years	2%

[0885] **Figure 1.** Sociodemographic variables

Table 1. Multivariate logistic regression among short term (30 days) and long term (1-year) end point and sociodemographic variables

30 days end point		Odds ratio (OR)	Confidence Interval (CI)
	No remission	3.18	0.11-6.3
Sex	Partial	0.62	-1.70-2.9
	Complete	2.56	0.42-4.7
	No remission	0.39	-0.32-1.1
Race /Ethnicity	Partial	2.2	-0.71-5.1
	Complete	0.09	-0.34-0.52
	No remission	-0.46	-3.24-2.32
Insurance type	Partial	0.20	-1.21-1.60
	Complete	0.27	-0.95-1.48
	No remission	0.08	0.003-0.15
Age	Partial	4.16	0.49-7.83
	Complete	0.044	0.01-0.1
	No remission	-1.35	-11.96-9.3
IBD location	Partial	-0.13	-2.6-2.36
	Complete	1.11	-0.96-3.2
1 year end point		**Odds ratio (OR)**	**Confidence Interval (CI)**
	Prolonged remission	0.6	-0.68-1.88
Sex	Corticosteroid persistent	-0.9	-2.90-1.1
	Surgical resection (Colectomy)	-15.3	-3173-3142
	Prolonged remission	0.28	-0.61-1.17
Race/ Ethnicity	Corticosteroid persistent	2.7	-1.05-6.48
	Surgical resection (Colectomy)	0.28	-0.61-1.17
	Prolonged remission	-0.16	-1.8-1.5
Insurance type	Corticosteroid persistent	0.25	-1.51-2.0
	Surgical resection (Colectomy)	-1.18	-5.1-2.7
	Prolonged remission	0.015	-0.02-0.05
Age	Corticosteroid persistent	1.61	-1.55-4.8
	Surgical resection (Colectomy)	0.003	-0.07-0.08
	Prolonged remission	1.45	-0.03-2.9
IBD location	Corticosteroid persistent	6.56	-4.96-18.1
	Surgical resection (Colectomy)	1.13	-1.47-3.7

S886

Hormone Replacement Therapy Is Associated With Disease Activity Improvement Among Post-Menopausal Women With Inflammatory Bowel Disease

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Introduction: There have been limited data on the impact of hormone replacement therapy (HRT) in post-menopausal women with inflammatory bowel disease (IBD). In this study, we sought to characterize the population of post-menopausal women with IBD and to determine the effect of HRT on disease activity.
Methods: A retrospective cohort study of postmenopausal women with IBD at the University of Minnesota and Jefferson University Hospital was conducted from 1/1/2000-1/1/2020. Electronic health records were manually reviewed for demographics, menopause history, IBD history including disease activity, surgeries, hospitalizations, and medications pre- and post-HRT. The physician global assessment (PGA) score was used to quantify disease activity. To control for the effects of menopause, IBD patients who had not undergone HRT were used as controls. Patients were matched by age at menopause onset (+/- 5 years) and IBD type. McNemar's test was used to compare outcomes pre- and post-HRT given the paired nature of the data. Pearson's chi-squared test was used to compare patients and controls.
Results: Of the 249 patients recognized from the initial search, we identified 37 women who were menopausal and started on HRT. Mean age of menopause onset in the HRT patients was 46 years, 59% had Crohn's disease (CD) and 41% had ulcerative colitis (UC). 31 matched controls that were within a 5-year range of menopause of the HRT patients were selected (61% CD, 39% UC). Based on PGA score, there was greater disease severity in the HRT cohort pre-menopause ($p=0.03$) and trend towards greater frequency of PGA score ≥ 2 ($p=0.11$). There was a significant *reduction* in frequency of PGA ≥ 2 post-HRT treatment ($p< 0.01$). HRT treatment was associated with a 5.6x increase in odds of post-HRT PGA score improvement compared to controls (OR 5.6; 95% CL 1.6, 19.7) in univariate logistic regression analysis. (Table)
Conclusion: Post-menopausal IBD women who underwent HRT therapy had a significant improvement in their disease activity following HRT compared to post-menopausal women without HRT therapy, who showed no change in disease activity. Pre-HRT disease activity seemed to be higher in patients who underwent HRT compared to the controls. While we found more women with active disease underwent HRT, further study in a larger cohort of patients is needed to confirm this finding.

Table 1. Outcomes pre and post hormone replacement therapy

	Pre-HRT	Post-HRT	P-value
Hospitalized (n=25)	10 (40%)	8 (32%)	0.32
Surgery	17 (46%)	5 (14%)	< 0.01
PGA scores			< 0.05
Remission	9 (24%)	17 (46%)	
Mild	16 (43%)	17 (46%)	

Table 1. (*continued*)

	Pre-HRT	Post-HRT	P-value
Moderate	7 (19%)	1 (3%)	
Severe	5 (14%)	2 (5%)	
Moderate to severe disease	12 (32%)	3 (8%)	< 0.01

S887

Trends in Hospitalization for Small Bowel Obstruction in Crohn's Disease Patients: A Nationwide Analysis From 2008 to 2018

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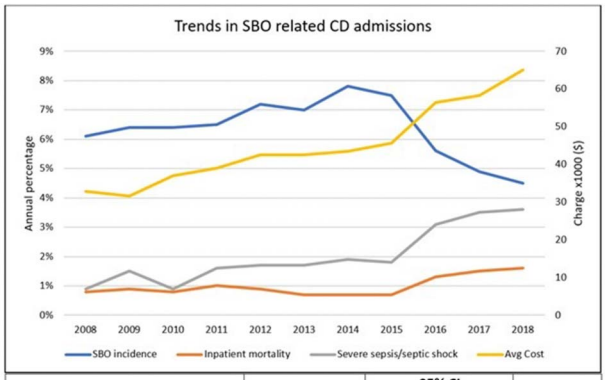
Introduction: Small bowel obstruction (SBO) is a known complication of Crohn's disease (CD). Over the last decade, there have been advances in management of CD including early treatment and newer immunosuppressives. The impact of these interventions on SBO remains unknown. We aim to study the trends in SBO related hospitalization in CD patients.
Methods: We used the National Inpatient Sample (NIS) database from 2008 to 2018 to identify patients with CD with concurrent diagnosis of SBO using ICD-9 and ICD-10 codes. We calculated trends in nationwide estimates for annual admissions, length of stay (LOS), in-patient mortality and complications of SBO including mortality, peritonitis and sepsis. We used the Cochran-Armitage test for trend significance. We used logistic regression to identify predictors of mortality among these admissions.
Results: There were a total of 2,195,512 admissions with CD between 2008 and 2018. Of those SBO accounted for 139,440 (6.78%) of these admissions. Of the patients admitted with SBO, the average age was 50 years and 52.6% were female. There was an increase in Elixhauser comorbidity index from a mean score of 3.0 in 2008 to 5.2 in 2018 ($p< 0.001$). There was a rising proportion of SBO cases among all CD admissions initially, rising from 6.0% in 2008 to a peak of 7.8% in 2014, followed by a significant decline down to 4.5% in 2018. Overall, 88.8% of SBO related admissions were emergent, with an increasing trend (from 86.1% to 92.3%, p-trend< 0.001) signifying more emergent admissions recently. The median LOS was 4 days, with a decrease from 4 days in 2008 period to 3 days in 2018. The overall mortality was 1.0%, with a stable trend until 2015 but an increase during last 3 years to 1.6% (p-trend< 0.001). There were no changes in the proportion with peritonitis (mean 3.3%) or intestinal perforation (mean 1.3%). Severe/sepsis/septic shock was present in 1.9% cases overall with an increasing rising proportion from 0.9% to 3.6% (p-trend< 0.001). Regression analysis showed ventilator use (OR 10.6, 95% CI 8.9 – 12.6), severe sepsis/septic shock (OR 6.1, 95% CI 5.1 – 7.3), age >50 (OR 3.4, 95% CI 3.0 – 4.3), intestinal perforation (OR 2.1, 95% CI 1.6 – 2.8) and female sex (OR1.5, 95% CI 1.3 – 1.7) were significant predictors of inpatient mortality. (Figure)
Conclusion: SBO remains a known complication of Crohn's disease. The proportion of CD patients with SBO seem to be decreasing but among these patients, inpatient mortality seems to be increasing which needs further investigation.



Mortality Predictors	Odds Ratio	95% CI		P-value
		lower	upper	
Weekend admission	0.92	0.79	1.08	0.317
Elective admission	1.14	0.92	1.42	0.214
Female sex	1.52	1.33	1.74	0.000
Elixhauser Score	1.10	1.10	1.11	0.000
Peritonitis	0.96	0.77	1.21	0.757
Intestinal perforation	2.15	1.62	2.84	0.000
Ventilator use	10.60	8.95	12.55	0.000
Severe sepsis/septic shock	6.09	5.13	7.23	0.000
Year	0.98	0.96	1.00	0.043
Age>50	3.60	2.99	4.33	0.000

[0887] **Figure 1.** Top half shows trend lines for incidence of SBO in CD patients, their inpatient mortality, rate of severe sepsis/septic shock and cost of hospitalization (adjusted for inflation). Bottom half depicting predictors of inpatient mortality using regression analysis

S888

Epidemiology of Documented Cannabis Use and/or Cannabis-Related Disorders in a Multi-Center Cohort of Inflammatory Bowel Disease Patients From 2012-2021

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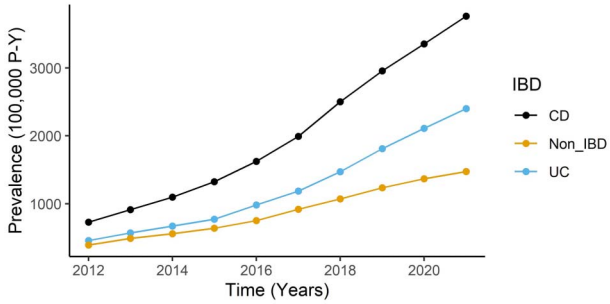
Introduction: Cannabis has been used for medicinal or recreational purposes since ancient time. Prior studies have shown that cannabis may provide symptom relief in inflammatory bowel disease (IBD) patients. However, chronic cannabis use has also been associated with various gastrointestinal disorders such as cannabinoid hyperemesis syndrome. The aim of this study was to examine the epidemiology of cannabis use and/or cannabis-related disorders (CU-RD) in IBD versus non-IBD patients as documented in the electronic health records (EHR) of a large multi-center patient cohort.
Methods: We performed a retrospective cohort analysis examining the overall and annual incidence and prevalence rates of CU-RD in IBD versus non-IBD patients in TriNetX (Cambridge, MA), a multi-center research network comprising of EHR from 59 heath care organizations in the United States. Incident diagnoses of CU-RD from 1/1/2012 to 12/31/2021 were captured using ICD-10 codes F12.x for cannabis-related disorders or laboratory tests positive for the presence of cannabinoids or tetrahydrocannabinol. IBD was identified by ICD-10 codes K50 as Crohn's disease (CD) or K51 as ulcerative colitis (UC). Chi-square tests were performed to compare categorical values and linear regression was used to analyze trends of continuous data.
Results: From 2012 to 2021, the incidence rates of CU-RD in CD, UC, and non-IBD patients were 1.74, 1.03, and 0.98 per 100,000 persons respectively. There was a significantly higher prevalence of CU-RD in CD (3.43%, N=7,458) and UC (2.18%, N=4,413) compared to non-IBD patients (1.15%, N=791,430) [OR=3.06, CI: 2.99-3.14, and OR=1.81, CI: 1.75-1.86, respectively]. The prevalence of CU-RD in IBD and

non-IBD patients has been rapidly rising over the past decade (Figure). CU-RD in IBD patients was more common in males compared to females (OR=1.44, CI: 1.39-1.49) and in African-Americans compared to other races (OR=2.56, CI: 2.45-2.68). CU-RD was most common in the young adult IBD population and was observed in disproportionately higher percentage in the Western states.
Conclusion: The prevalence of CU-RD is rapidly rising in IBD patients. In a multi-center patient cohort, IBD patients have approximately 2 to 3 times higher odds of having CU-RD compared to non-IBD patients. More research is needed to examine the effect of cannabis in IBD.



[0888] **Figure 1.** Prevalence of Cannabis Use and/or Cannabis-Related Disorders in IBD and non-IBD Patients in TriNetX from 2012-2021

S889

Use of Newer Biologic Therapies in Patients With Refractory Microscopic Colitis

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Introduction: Several treatment options exist for microscopic colitis (MC), with the most common being budesonide. While budesonide results in response or remission in most patients, some patients do not respond, have side effects, or need long term maintenance. Biologics including anti-tumor necrosis factor alpha (TNF-a) have been described for MC, but vedolizumab and ustekinumab use has been uncommonly reported. We aimed to assess the effectiveness and safety of these newer biologics in patients with MC.
Methods: Patients seen at an academic referral center were identified from the medical record using diagnostic codes for microscopic, lymphocytic, or collagenous colitis who were prescribed a biologic treatment. Diagnoses and use of biologic therapy were confirmed by chart review. We selected patients who received at least one dose of vedolizumab or ustekinumab. Response was defined as complete response (resolution of diarrhea), partial response (at least 50% improvement but not resolution), nonresponse (< 50% improvement), or intolerance (drug stopped due to adverse event).
Results: Sixteen patients were identified. Three patients were lost to follow-up leaving thirteen in this study cohort (12 received vedolizumab and 1 ustekinumab). The median age at start of biologic therapy was 47 years (range 33-76) and 69% were female. Most patients (76.9%) were budesonide refractory and four had failed anti TNF-a therapy. In the vedolizumab group, two (16.7%) achieved complete response, five had partial response (41.7%), and five (41.7%) were non-responders. Two out of 5 with partial response lost response; 1 responded to dose escalation and 1 (who could not stop NSAID use) did not. Two patients (16.7%) reported vomiting and nausea following vedolizumab infusions, but no patient had to discontinue receiving treatment due to adverse events. The one ustekinumab treated patient had partial response to every 8-week dosing and achieved complete response with escalation to every 4-week dosing.
Conclusion: Vedolizumab and ustekinumab may be viable options for refractory MC, including in patients who did not respond to anti TNF-a therapy, although dose escalation may be needed. Complete remission with vedolizumab was lower than has been reported previously. Prospective, randomized, controlled trials of these newer agents are needed to define their role in the treatment algorithm for patients with MC.

S890

A Diet High in Fruits and Vegetables During Biologic Induction May Improve Response to Biologics in Patients With Inflammatory Bowel Disease

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Introduction: Several biologics now exist as treatment for inflammatory bowel disease (IBD) but effective induction of remission still ranges between 20-40% for most. Studies suggest that diet may modify intestinal inflammation. In this study, we sought to examine the effect of diet on biochemical response to biologic induction therapies.
Methods: We conducted a single-center retrospective analysis of patients with IBD seen at a tertiary referral center from 2019 to 2021. A validated 26-item diet questionnaire, the Dietary Screener Questionnaire (DSQ), was completed as part of a pre-check-in process before each clinic visit. IBD patients who completed a DSQ within three months of induction of a biologic (anti-TNFs, vedolizumab, ustekinumab) and who had markers of inflammation available pre and post-induction (C-Reactive Protein (CRP)) were included. Follow up period was 3 months post-induction. Using linear and average mixed-effects models, we examined the contribution of food items in the DSQ (i.e., processed meats, red meats, fruits, vegeTables) to a reduction in CRP following induction. We used pre-induction biochemical markers as a baseline reference. Current steroid use, prior biologic exposure, age, gender, body mass index (BMI), smoking status, IBD type (ulcerative colitis (UC) or Crohn's disease (CD)), and class of biologic were added as covariates in the models.
Results: A total of 105 patients were included in this study (62.9% had CD and 32.4% had UC). The most common biologic was anti-TNFs (52.4%). The mean CRP value pre-induction was 13.4 (SD 20.2) and post-induction was 6.63 (SD 12.4). On multivariable analyses adjusting for covariates mentioned, we found an independent effect of high daily intake of fruits and vegeTables on reduction in CRP. For every 1 unit increase in daily fruits and vegeTables, there was a reduction in CRP value by 1.82 post-induction of biologics (p=0.04), Table. Red meat intake, processed meats, fiber from whole grains, and dairy were not associated with CRP reduction (Table).
Conclusion: In this preliminary analysis, we find that a diet high in fruits and vegeTables during induction of biologics may independently improve biochemical response. Future clinical drug trials should consider dietary assessment and the influence of diet on response to medication treatment.

Table 1. Average Marginal Effects (AME) Assessing the Contribution of Each Variable on the Reduction of CRP Level During Induction

Factor	Average Mixed Effects (AME)	Standard Error (SE)	p-value
Age	0.1253	0.07186	0.862
Gender (Male)	0.30313	0.23377	0.1977
BMI	0.08005	0.07203	0.2701
IBD- Ulcerative Colitis	-0.33136	0.14984	**0.0304**
Previous biologic use	-0.03417	0.14799	0.818
anti-TNF biologic induced (ref)	1.29018	0.94172	0.1734
Ustekinumab induced	0.10442	0.15699	0.5082
Vedolizumab induced	0.1059	0.17734	0.5525
Steroids on induction	0.23593	0.14915	0.1181

Table 1. (*continued*)

Factor	Average Mixed Effects (AME)	Standard Error (SE)	p-value
Diet Factors			
Red Meat	-0.01567	0.17881	0.9303
Processed Meat	-0.32794	0.34438	0.343
Fiber	0.5546	0.05404	0.3071
Calcium	0.15903	0.19979	0.4277
Whole grain (cups)	-0.40034	0.26105	0.1279
Added sugar (teaspoons)	-0.01585	0.0235	0.5014
Dairy (cups)	0.0488	0.32823	0.8821
Fruit (cups)	0.62825	0.76457	0.413
Fruits and Vegetables daily (cups)	-1.8186	0.87858	**0.0406**

S891

Risk of Cervical Dysplasia/Cancer in Patients With Inflammatory Bowel Disease: A Systematic Review and Meta-Analysis

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Introduction: There is inconsistent and conflicting evidence regarding the risk of cervical dysplasia/cancer in patients with inflammatory bowel disease (IBD). This systematic review was conducted to determine the risk of cervical abnormalities in patients with IBD and also estimate the comparative risk with respect to the general population.
Methods: We searched various databases for studies which reported about rates of cervical intraepithelial neoplasia(CIN), cervical cancer or high risk HPV in IBD patients. We also extracted the rates of CIN, cervical cancer and high risk HPV in controls. Pooled prevalence of these lesions in IBD and relative risk in IBD patients in comparison to the healthy controls was estimated. We excluded studies which did not provide relevant data. All analysis were done in R version 4.1.1 using the meta and metafor packages. The random effects model was used with inverse variance approach for pooled prevalence and M-H method for calculation of relative risk.
Results: We searched Embase, Medline and Pubmed and identified 522 relevant papers on 25th April 2022. Duplicates were removed and after initial screening, 44 papers were selected for full text screening. Eventually, 9 papers (5 case control and 4 cohort studies of 53,781 patients with IBD) were included in the quantitative synthesis. The pooled prevalence of CIN, cervical cancer and high risk HPV in the IBD population was 0.04 (0.01 - 0.11, I^2= 100%). Patients with IBD were at a greater risk of cervical dysplasia/cancer when compared with healthy controls (relative risk 3.01, 1.44 - 6.31, I^2= 100%).
Conclusion: The patients with inflammatory bowel disease are at a heightened risk of developing cervical abnormalities like CIN,cervical cancer and high risk HPV lesions as compared to normal controls. These findings point to the importance of undergoing screening at regular intervals and significance of HPV vaccination in IBD patients in aiding to reduce the risk of developing cervical cancer.

S892

Impact of Concomitant Hypothyroid Disease and Inflammatory Bowel Disease

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Introduction: Inflammatory bowel disease (IBD), comprised of Ulcerative Colitis (UC) and Crohn's Disease (CD), is caused by a combination of environmental factors, immune dysregulation, and genetic susceptibility. Other immune-mediated phenomena, like hypothyroidism, have also been observed in this population. Thus, we sought to explore clinical characteristics and outcomes among IBD patients with hypothyroidism compared to IBD patients without hypothyroidism.
Methods: In a retrospective chart review from a large, tertiary, academic medical center, baseline demographics and clinical data were extracted for patients diagnosed with either UC or CD and having at least one thyroid stimulating hormone (TSH) measurement from prior to 2016. Based on the presence of a documented hypothyroidism ICD-10 code, patients were then divided into two groups, those with IBD alone and those with both IBD and hypothyroidism, as described in Figure. Individual charts were then further examined for disease characteristics, biomarkers, healthcare utilization, medication use, and other comorbidities from 2016 to 2022. Demographic and clinical variables were then compared between the two groups, as seen in Table.
Results: We identified 166 adult IBD patients (CD 53%, UC 47%). The mean age was 62.9 years. Among these patients, 116 patients (69.9%) had IBD and hypothyroidism. The most common causes of hypothyroidism were Hashimoto, subclinical, and acquired hypothyroidism. No differences were noted in race, smoking status, or BMI. IBD disease location, behavior, and prevalence of extra-intestinal manifestations did not significantly differ between the two study groups. Both groups had similar number of colonoscopies, hospitalizations, as well as comparable medication use (SSRI/SNRI, steroids, 5-ASA, immunomodulators, biologics). However, patients with IBD and hypothyroidism had higher rates of anemia (p=0.03), hypoalbuminemia (p=0.007), and CRP elevations (p=0.002). Furthermore, patients with both IBD and hypothyroidism had a greater median number of emergency department visits (p=0.039) and axial radiography (p=0.002).
Conclusion: IBD patients with hypothyroidism experience a more severe disease course with higher biomarkers of inflammation and healthcare utilization than those without hypothyroidism despite similar IBD phenotype and therapy exposures. This highlights a potential subgroup of IBD patients who may be at risk for increased disease severity and associated poor outcomes.

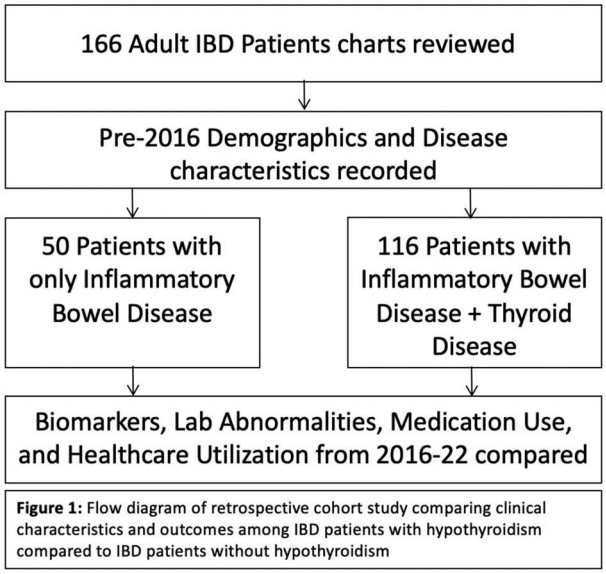

Figure 1: Flow diagram of retrospective cohort study comparing clinical characteristics and outcomes among IBD patients with hypothyroidism compared to IBD patients without hypothyroidism

[0892] **Figure 1.** Flow diagram of retrospective cohort study comparing clinical characteristics and outcomes among IBD patients with hypothyroidism compared to IBD patients without hypothyroidism

Table 1. Baseline characteristics, univariate analysis and multivariate analysis of biomarkers, lab abnormalities, and healthcare utilization

Baseline Characteristics at enrollment (Collected prior to 2016)	Total Sample	IBD only	IBD + Thyroid disease	P value
n	166	50	116	
Age, Mean (SD)	62.9 (18.3)	57.8 (19.9)	63.6 (17.3)	0.062
Female (n, %)	118 (71.1%)	30 (60%)	88 (75.9%)	0.039
White	138	41 (82%)	97 (83.6%)	0.798
Never Smoker	95	31 (62%)	64 (55.2%)	0.415
BMI (median, IQR)		25.3 (6.4)	26.0 (8.07)	
IBD subtype				0.116
CD	87 (52.7%)	31 (62%)	56 (48.7)	
UC	78 (47.3%)	19 (38%)	59 (51.3%)	
Disease duration (Years, median, IQR)	7.44 (3.8)	7.68 (4.1)	7.26 (3.6)	0.257
Hypothyroid Disease duration (Years, median, IQR)			7.74 (3.5)	
Elevated TSH (>5) ever	55 (33.1%)	5 (10%)	50 (43.1%)	< 0.001
Levothyroxine Rx ever	89 (53.9%)	1 (2%)	88 (76.5%)	< 0.001
PTU or Methimazole Rx ever	3 (1.8%)	1 (2%)	2 (1.8%)	0.914
Intestinal Surgery ever	61	16 (32%)	45 (39.1%)	0.383
Extra-intestinal disease	19 (11.4%)	3 (6%)	16 (13.8%)	0.148
Univariate Analysis of Biomarkers, lab abnormalities, and Healthcare Utilization during study period (2016-22)				
Anemia ever	92 (55.8%)	21 (42.9%)	71 (61.2%)	0.03
Hypoalbuminemia ever	39 (23.5%)	5 (10%)	34 (29.3%)	0.007
CRP elevation ever	73 (51%)	12 (30%)	61 (59.2%)	0.002
ESR elevation ever	58 (43.6%)	10 (29.4)	48 (48.5)	0.053
Median # of Colonoscopy	1 (2)	0.5 (2)	1 (3)	0.326
Median # of ED visits	0 (2)	0 (1)	1 (2)	0.039
Median # of Hospitalizations	0 (2)	0 (1)	0.5 (3)	0.101
Median # of Xrays and CT scans	3 (8)	1 (4)	4 (8)	0.002
Multivariate Model of Biomarkers, lab abnormalities, and Healthcare Utilization during study period (2016-22)	Adjusted Odds Ratio (95% CI)			P-value
Anemia ever	2.34 (1.16-4.71)			0.018
Hypoalbuminemia ever	3.82 (1.38-10.56)			0.010
CRP elevation ever	3.19 (1.45-7.03)			0.004
ESR elevation ever	2.21 (0.94-5.15)			0.068
>1 Colonoscopy	1.24 (0.62-2.46)			0.538
>1 ED visit	2.38 (1.17-4.84)			0.016
>1 Hospitalizations	1.59 (0.80-3.18)			0.188

Table 1. (*continued*)

Baseline Characteristics at enrollment (Collected prior to 2016)	Total Sample	IBD only	IBD + Thyroid disease	P value
>1 X-rays and CT scans	2.96 (1.43-6.14)			0.003

S893

Online Patient Education for Inflammatory Bowel Disease

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Introduction: Studies have shown that approximately 50% of patients with inflammatory bowel disease (IBD) use the internet to gather IBD-specific information. Its use has been positively linked with disease activity and severity. Patient education also improves satisfaction and participation with treatment. The primary aim of our study was to evaluate the accuracy, comprehensiveness, and readability of online patient education resources for IBD.
Methods: We performed a cross-sectional analysis of online patient educational resources for IBD using Google in June 2022. We used the web tool 'Isearchfrom.com' to search the terms "Inflammatory bowel disease" and "IBD blog". This tool disables Google's personalized results function and allows the user to perform a Google search through different cities in the United States (US). We performed online searches from two wealthiest and poorest cities and two largest and smallest cities from four major US regions to determine if variations existed in the availability of online resources. The top 10 Google websites, blogs and videos for the searches from each of the 16 cities were included and independently reviewed. Resources were graded based on fulfilment of specific criteria regarding different aspects of IBD. The readability of each website and blog was assessed using the Flesch-Kincaid readability test.
Results: There was no difference in the search results of websites, blogs, or videos between the 16 cities. Three websites were from hospital/academic affiliated sites and seven were from non-hospital/academic affiliated sites (titled "other" in Table). No website, blog or video met 100% of the criteria. Average percentage of total IBD criteria mentioned was 72% for academic websites, 83% for other websites, 65% for blogs, and 49% for videos. IBD definition, clinical manifestations, and use of immunosuppressive medications were mentioned most among the resources (87%). Coagulopathy, following with a gastroenterologist, and health maintenance were the least mentioned criteria (30-40%). 75% of the websites and blogs exceeded the recommended reading level of 6th grade for patient education materials by the National Institute of Health.
Conclusion: The online patient education materials were accurate but varied in their comprehensiveness. The majority of patient material exceeded the recommended readability. It is important for clinicians to be familiar with these patient resources and guide patients accordingly.

Table 1. **Percentage of each Inflammatory Bowel Disease criteria met by each category of websites, blogs and videos**

Criteria (n=36)		Website		Blogs (n=10)	Videos (n=10)
		Academic (n=6)	Other (n=4)		
Background	Defines GERD	100%	100%	100%	100%
	Explains disease pathophysiology	83%	75%	80%	80%
Clinical Manifestation	Heartburn	100%	100%	100%	100%
	Chest pain	100%	100%	70%	60%
	Dysphagia	100%	100%	100%	70%
	Regurgitation or sour taste	100%	100%	100%	90%
	Cough	100%	100%	90%	70%
	Sleep disturbances	50%	75%	30%	20%
Risk Factors	Obesity	67%	100%	60%	70%
	Hiatal hernia	67%	100%	50%	50%
	Pregnancy	67%	100%	60%	40%
	Diabetes or Gastroparesis	0%	50%	0%	30%
	Autoimmune	17%	50%	0%	10%
Complications	Esophageal stricture	83%	100%	60%	40%
	Gastroesophageal ulcers or esophagitis	83%	100%	50%	30%
	Barrett's Esophagus	83%	100%	90%	40%
Diagnosis	Endoscopy	100%	100%	50%	40%
	pH monitoring	100%	75%	40%	40%
	Manometry	67%	75%	30%	20%
	Barium swallow	83%	75%	30%	30%
Management	Antacids	100%	100%	70%	80%
	Proton pump inhibitors	100%	100%	90%	80%
	Histamine 2 Receptor Antagonists	100%	100%	70%	70%
	Surgery	83%	100%	80%	70%
	Endoscopic interventions	33%	50%	20%	30%
Modifiable risks	Weight loss	100%	100%	70%	60%
	Smoking cessations	100%	100%	70%	60%
	Avoid alcohol	100%	75%	100%	60%
	Avoid coffee	100%	100%	70%	60%
	Avoid medications that can worsen symptoms (i.e., aspirin, NSAID)	50%	100%	40%	50%

Table 1. (*continued*)

Criteria (n=36)		Website		Blogs (n=10)	Videos (n=10)
		Academic (n=6)	Other (n=4)		
Lifestyle interventions	Avoid trigger foods	50%	100%	90%	50%
	Eat small meals	83%	100%	50%	40%
	Eat food slowly/chew	100%	100%	70%	60%
	Elevate head of the bed	0%	0%	30%	10%
	Sleep on left side	100%	100%	80%	50%
	Avoid lying flat after eating or eating 2-3 hours prior to bedtime	50%	100%	90%	50%

S894

Inpatient Outcomes and Healthcare Utilization in Obese vs Non-Obese Patients Hospitalized with an Acute Crohn's Disease Flare—A Nationwide Cohort Study

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Introduction: Crohn's Disease (CD) remains a leading cause of patient morbidity and in severe cases, mortality. Given the rise in prevalence of obesity in the United States, the goal of this study is to illustrate the impact of obesity on hospitalized patients admitted for acute flares of Crohn's Disease (CD). Our primary outcome was odds of inpatient mortality. Secondary outcomes included length of hospitalization (LOS), total hospital charge (THC), and complications including sepsis, upper and lower GI bleed (UGIB)(LGIB), and acute kidney injury (AKI).
Methods: The National Inpatient Sample (NIS 2016-2018) was sourced for hospitalization data from adult patients admitted for a CD flare. The queried pool of patients was stratified into obese (BMI $\geq$ 30), and non-obese cohorts using International Classification of Diseases, Tenth Revision (ICD-10) codes. After performing descriptive analysis on the involved cohorts, linear and multivariate regression was used to evaluate study outcomes. STATA 14 was used for data analysis.
Results: Of 232,650 admissions for CD flare, 20,100 (8.64%) had comorbid obesity. Compared to non-obese-CD patients, obese-CD patients were significantly older (45.8 vs 43.7 years, $p < 0.0001$), were more often female (65.9% vs 52.7%, $p < 0.0001$), and had greater African American representation (17.3% vs 15.4%, $p < 0.0001$) compared to non-obese patients. Obese-CD patients had more comorbid disease as measured by a Charlson Comorbidity Index score $\geq$3 (9.80% vs 5.16, $p < 0.0001$), and had more patients belonging to the poorest quartile of family income (29.0% vs 26.3%, $p< 0.0001$). No difference in adjusted odds of inpatient mortality was noted between the two groups. Obese-CD had higher rates of AKI (OR 1.17, $p = 0.011$), and had significantly increased LOS (5.04 vs 4.78 days, $p = 0.006$). There were no differences in total hospital cost, LGIB, or shock.
Conclusion: Obesity did not significantly increase inpatient mortality. However Obese-CD patients had increased odds of AKI and increased LOS relative to CD patients without obesity. Additional studies are needed to further investigate the effects of obesity in CD, and to help reduce the economic burden obesity places on the healthcare system.

S895

Predicting Potential Candidacy for IBD Research Trials Using Integrated Data Science Modeling in Community-Based GI Practices

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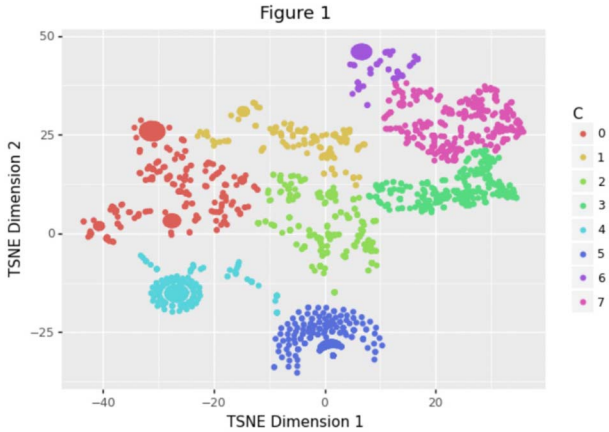
Introduction: IBD patients often relapse and require a change in treatment (Rx). Our goal was to assess patients therapeutic journey and identify those who may be candidates for research trials based on AI algorithm derived data that quantifies propensity for current Rx failure.
Methods: We analyzed 2,712 patients with a confirmed diagnosis of IBD (Crohn's and UC). For each we compiled a list of related ICD10 symptom codes, partitioning into 11 distinct sets corresponding to symptom category. Similarly, we compiled a list of IBD medication codes prescribed to each patient, assigning each to one of six drug categories (e.g. 5ASA, steroids, Biologics). We constructed a feature set for each patient by summing the number of diagnoses and prescriptions which was then transformed into a 2-dimensional feature space using TSNE. This feature space was partitioned using HAC clustering with Ward linkage. Analysis indicated the optimal number of clusters to be 8 (Table).
Results: Analysis of the base feature set for each cluster (C) indicated a high degree of uniformity, and the overall picture confirmed the anecdotal evidence from physician experts for treating IBD. In Fig 2 we see the clusters identified by color. C5 is the null group, for whom we have no data, or only a single secondary symptom of IBD, and C0 includes patients for whom we have more significant symptom data, but no treatment data. C 4, 2 and 3 form a continuum where C4 includes patients who have been treated with 1-2 steroid courses, C2 contains patients with >= 2 steroid courses together with at least one other drug category, and the right side of C3 contains patients with multiple steroid courses together with at least 4 other Rx categories. C6 and C7 form a similar continuum with similar trends but centered around ASA treatments. C1 contains patients with only antibiotic Rx and no other Rx types and blends into the corticosteroid spectrum of C2 and 3. Biologic therapy was not the defining feature of any specific cluster, but does distinguish C2 from C3 and C6 from C7. We conclude that C3 and C7 contain strong candidates for research. (Figure)
Conclusion: Our AI model successfully confirms the anecdotal data provided by our physician experts and drug trial sponsors. The tool can identify patients who are currently good candidates for IBD drug trials in advance of a clinic visit and predict those who are likely to become good candidates sometime in the future.



[0895] **Figure 1.** Two dimensional projection of symptom and treatment data, with clusters marked

Table 1.

Clusters	Calinsky-Harabasz Index
4	284.108512
5	373.804537
6	306.331922
7	284.240381
8	428.465493
9	383.481193
10	345.519132
11	320.023012

S896

Relationship Between Fecal Calprotectin and Small Bowel Capsule Endoscopy Results

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Introduction: Small bowel capsule endoscopy (SBCE) has become an important tool in small bowel evaluation in patients with inflammatory bowel disease (IBD). Fecal calprotectin (FCP) is a reliable biomarker for bowel inflammation. In this study, we sought to evaluate the relationship between FCP and SBCE results.
Methods: We performed a retrospective review of SBCE using a tertiary-care center's PillCam database from 8/3/2018-8/18/2021. Patients undergoing SBCE for the evaluation and diagnosis of IBD were included. We then conducted chart review of these patients to investigate prior endoscopic procedures and FCP levels. Normal FCP levels were defined as less than 50 mcg/g.
Results: A total of 83 patients were included in our analysis (56.6% female, mean age 41.8 years [range 20-75 years]). Four patients had SBCE performed 2 separate times, totaling 87 SBCE reviewed. Twenty-three (27.7%) patients had findings compatible with active IBD on their SBCE. Of the 60 patients with negative capsule findings, 30 had a FCP collected within 6 months of SBCE. 11/30 (37%) of these patients had normal FCP levels. Of the 23 patients with positive capsule findings, 9 had a FCP collected within 6 months of SBCE. 0/9 (0%) of these patients had normal FCP levels. Patients with normal FCP were significantly more likely to have a negative capsule study (p=0.03). All 11 patients with normal FCP had a colonoscopy prior to SBCE, and 0/11 (0%) had findings consistent with IBD on biopsy. The most common locations for positive capsule findings in patients with elevated FCP were as follows: ileum (6 patients, 67%), jejunum (4, 44%), duodenum (2, 22%), stomach (2, 22%), and colon (1, 11%). Of the 9 patients with positive capsule findings and elevated FCP, 8 (88%) had a colonoscopy within 6 months of SBCE. Six of these patients (75%) had evidence of IBD in their colon.
Conclusion: Our study investigated the relationship between FCP and SBCE results. Patients with normal FCP levels are significantly more likely to have negative SBCE results, and these patients were also more likely to have a normal colonoscopy. The most common location of pathology seen on SBCE in patients with elevated FCP was the ileum. This suggests that that FCP may be more useful in evaluating distal, rather than more proximal, bowel inflammation.

S897

Ustekinumab Versus Tofacitinib as Second-Line Therapy for Ulcerative Colitis: A Retrospective, Observational Study

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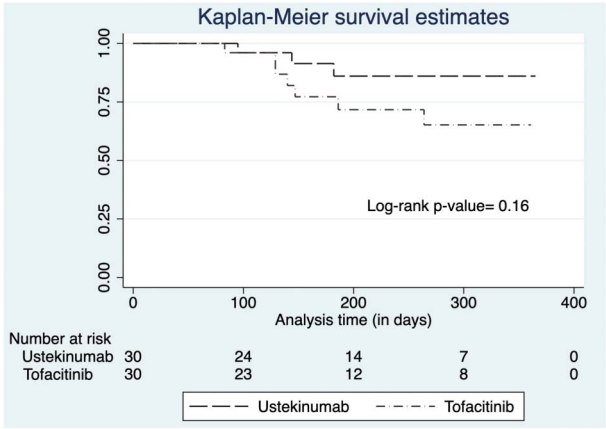
Introduction: Treatment options for ulcerative colitis (UC) have expanded rapidly over the past two decades. However, optimal positioning of these agents, particularly after previous biologic failure, remains uncertain. We sought to assess the clinical effectiveness and medication persistence rates of ustekinumab (UST) compared to tofacitinib (TOF) in UC patients with prior biologic exposure.
Methods: Patients with UC followed at a tertiary ambulatory referral center who were ≥18 years of age with previous failure of anti-TNF therapies or vedolizumab who then started UST or TOF were eligible for inclusion. Partial Mayo Scores, laboratory data including inflammatory markers, concomitant steroid use, and disease specific data were collected at baseline. The primary outcome was the percentage of individuals in clinical remission at 12 months after medication initiation, defined as a Partial Mayo Score of ≤3. Steroid-free remission and medication persistence at 12 months were also assessed. Rates of serious adverse events were compared between therapies. Clinical remission was measured at follow-up visits during the 12 months after initiation, with the last observation carried forward, and compared via Fisher's exact test. Medication persistence was assessed via Kaplan-Meier curves and log-rank tests, censoring at the last known visit up to 12 months after initiation.
Results: Thirty patients initiating UST and 30 patients initiating TOF were identified from 2017 to 2021. Baseline demographics were similar between the UST and TOF treatment groups, though individuals receiving TOF had higher Partial Mayo Scores and a higher average number of prior biologics (Table). At 12 months, clinical remission rates were similar in those receiving UST compared to those initiating TOF (66.7% vs 56.7%; p=0.60), as were rates of steroid-free clinical remission (56.7% vs 43.3%; p= 0.44). Medication persistence rates were numerically higher with UST compared to TOF (90.0% vs 76.7%, p=0.16 (Figure). Adverse events were rare in both groups.
Conclusion: In this retrospective cohort study, rates of clinical remission and medication persistence were similar between UST and TOF in individuals who had failed prior biologic therapy. Adverse event rates were similar between groups. Larger prospective studies with adjustment for confounding by channeling bias are required to best elucidate the ideal position for these therapies after failure of an initial biologic therapy.



[0897] **Figure 1.** Kaplan-Meier Survival Curves of medication persistence comparing ustekinumab to tofacitinib after prior biologic failure in ulcerative colitis

Table 1. Baseline Characteristics

	Ustekinumab	Tofacitinib
Patients	30	30
Age		
Median, Years	42.5	38.5
IQR, Years	32.5 - 55.0	29.0 - 46.5
Sex		
Male, Percent	50.0	56.0
Female, Percent	50.0	44.0
Race		
White, Percent	86.7	93.3
Asian, Percent	3.3	0.0
More Than One Race, Percent	3.3	3.3
Unknown Race, Percent	6.7	3.3
Ethnicity		
Hispanic or Latino, Percent	10.0	6.7
Disease duration		
Median, Years	6.0	6.0
IQR, Years	3.3 - 11.0	4.0 - 9.8
Disease distribution		
Extensive Colitis (E3), Percent	63.3	83.3
Left-Sided Colitis (E2), Percent	36.7	16.7
Proctosigmoiditis (E1), Percent	0.0	0.0
Smoking status		
Active Smoker, Percent	0.0	0.0
Prior failed therapies		
Mean Number of Failed Biologic Therapies	2.3	3.2
Failed 1 Biologic, Percent	53.3	20.0
Failed 2 Biologics, Percent	36.7	46.7
Failed 3+ Biologics, Percent	10.0	33.3
Failed TNF Inhibitor, Percent	76.7	96.7
Failed Vedolizumab, Percent	63.3	73.3
Failed Immunosuppressant, Percent	66.7	80.0
Baseline partial mayo score		
Median	4.0	5.5
IQR	3.0 - 6.0	4.0 - 7.0
Baseline Rectal Bleeding, Percent	43.8	73.3
Baseline inflammatory data		
CRP, Mean	11.1	12.9
CRP, StDev	16.0	14.5

Table 1. (*continued*)

	Ustekinumab	Tofacitinib
Fecal Calprotectin, Mean	1546	1048
Fecal Calprotectin, StDev	1373	1121
Baseline steroid use		
Steroid Utilization, Percent	60.0	76.7
Prednisone Utilization, Percent	36.7	70.0
Budesonide Utilization, Percent	16.7	3.3
Baseline non-biologic therapies		
Immunosuppressant Utilization, Percent	3.3	3.3
Aminosalicylate Utilization, Percent	10.0	10.0

S898

Factors Associated With Overall Response to Biologic Therapy

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Introduction: The advent of biologic therapy has revolutionized the approach to treating patients with inflammatory bowel disease (IBD). However, up to 40% of patients do not respond to initial biologic therapy, prompting a switch to a new biologic. Factors associated with primary response to initial biologic therapy have been described, though literature is conflicting. We aim to explore factors that predict overall response to biologic therapy using real-world data, considering patients who have been on multiple biologics.
Methods: We conducted a retrospective chart review of patients age ≥ 18 years with IBD who received between one to three biologic therapies between 2015 and 2021 at a single tertiary care center. Demographic data, baseline disease characteristics, treatment history, laboratory values, clinical activity scores, and endoscopy reports were abstracted. Response to therapy was defined by low clinical disease activity scores, low calprotectin, and inactive disease on endoscopy (Table). Multivariable logistic regression was used to evaluate patient- and disease-specific factors associated with response to biologic therapy.
Results: There were 773 subjects with 1246 initiations of a biologic drug (78% anti-tumor necrosis factor). Mean age was 36.8 (standard deviation 15.5) years, and 52.1% had Crohn's disease. 217 patients had only been treated with one prior biologic, and 128 patients had been treated with two prior biologics. Factors that predicted poor response to biologic therapy included use of two prior biologics (aOR 0.63, 95% CI 0.40-0.98) and diagnosis of primary sclerosing cholangitis (PSC) (OR 0.38, 95% CI 0.16-9.92) (Table). Concurrent use of an immunomodulator predicted response to therapy (aOR 1.63, 95% CI 1.22-2.19). Age, sex, race, smoking status, concurrent 5-ASA or steroid use, disease duration, and prior IBD surgery were not associated with clinical response to biologics overall.
Conclusion: Pharmacologic management of patients with IBD is complex, and decisions regarding treatment initiation are multifactorial. Providers should consider that patients with PSC may have suboptimal response to biologic therapy, and concurrent prescription of an immunomodulator may improve the likelihood of response, independent of prior biologic therapy. Lack of response to two prior biologics should prompt an early multidisciplinary discussion about next steps in treatment, given high likelihood of poor response to a third biologic.

Table 1. **Multivariable regression analysis examining factors associated with response to biologic therapy**

	aOR (95% CI)	*p* value
Demographics		
Age	0.99 (0.98-1.00)	0.14
Female	1.02 (0.77-1.34)	0.90
Prior biologic use		
1st biologic	Reference	
2nd biologic	0.84 (0.62-1.14)	0.27
3rd biologic	**0.63 (0.40-0.98)**	**0.04**
Race		
White	Reference	
Black	0.51 (0.25-1.01)	0.06
Asian	1.31 (0.72-2.37)	0.38
Other	0.75 (0.52-1.08)	0.13
Tobacco use		
Never smoker	Reference	
Former smoker	1.20 (0.61-2.36)	0.59
Current smoker	1.70 (0.92-3.14)	0.09
Disease characteristics		
Prior IBD surgery	1.08 (0.70-1.66)	0.72
Concurrent steroid	1.05 (0.79-1.40)	0.73
Concurrent immunomodulator	**1.63 (1.21-2.19)**	< **0.01**
Concurrent 5-ASA	1.19 (0.84-1.68)	0.34
Disease duration	1.00 (0.98-1.02)	0.78
EIMs		
Uveitis	1.02 (0.45-2.35)	0.96
Oral ulcers	0.82 (0.47-1.43)	0.49
Peripheral arthropathy	0.86 (0.57-1.29)	0.47
Axial arthropathy	1.39 (0.78-2.49)	0.26
Inflammatory skin changes	1.40 (0.62-3.14)	0.42

Table 1. (*continued*)

	aOR (95% CI)	*p* value
PSC	**0.38 (0.16-0.92)**	**0.03**

Response was defined by low clinical disease activity scores (Harvey Bradshaw Index < 5, Simple Clinical Colitis Activity Index < 3), calprotectin < 50 μg/mg, and inactive disease on endoscopy.
Abbreviations: aOR = adjusted odds ratio; CI = confidence interval; IBD = inflammatory bowel disease; EIMs = extraintestinal manifestations; PSC = primary sclerosing cholangitis.
Note: model adjusted for age, sex, smoking status, prior surgery, concomitant medications, extraintestinal manifestations, and disease duration.

S899

Sex and Racial Disparities in Cardiovascular Disease Risk and Major Adverse Cardiac and Cerebrovascular Events in NAFLD: A National Inpatient Sample Analysis (2019)

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Introduction: Non Alcoholic Fatty Liver Disease (NAFLD) increases the risk of CVD independently of the conventional cardiovascular risk factors. However, related sex and racial disparities in cardiovascular outcomes remain poorly understood on the large scale. This prompted us to attempt an investigation between the association of NAFLD and major cardiovascular and cerebrovascular events [MACCE] using a nationally representative sample in the US.
Methods: We curated National Inpatient Sample (2019) for NAFLD hospitalizations stratified by age, sex and race using ICD-10 codes. Baseline characteristics, comorbidities, and MACCE:all-cause mortality, acute myocardial infarction (AMI), cardiac arrest and stroke were compared between groups stratified by sex and race. Multivariate regression analyses were performed adjusting for sociodemographics, hospitalization characteristics and comorbidities.
Results: Our study included 409,130 NAFLD hospitalizations [median 55 (IQR 43-66) years. The prevalence of NAFLD was higher in females vs males (1.2%), Hispanic (2%), Native Americans (1.9%) vs white. Median age of females was 55 years (IQR 42-67), were often from lowest income quartile, Medicare enrollees, and had non-elective admissions. Females demonstrated lower rates of hypertension, hyperlipidemia, complicated diabetes but higher rates of obesity and uncomplicated diabetes vs. males. Median age of Hispanics was 48 years (IQR 37-60), majority of them belonged to the lowest income quartile, Medicaid enrollees, and underwent non elective admissions. Hispanics exhibited lower frequency of hypertension, hyperlipidemia but higher rates of diabetes and obesity vs. whites. Geriatric patients had higher risk of MACCE (aOR 3.01), all-cause mortality (aOR 4.13), Acute MI (aOR 2.81), Cardiac arrest (aOR 2.24) and Stroke (aOR 2.58) (p< 0.001). Males had greater risk of MACCE (aOR 1.22), AMI (aOR 1.35) and Cardiac arrest (aOR 1.54) (p< 0.001). By race, Native Americans (aOR 1.64) followed by Asian Pacific Islanders(API) (aOR 1.18) had significantly higher odds of all-cause mortality vs whites (Table).
Conclusion: NAFLD is associated with adverse MACCE especially with increasing age and male sex. Native Americans followed by API race was associated with higher odds of all-cause mortality. This study reiterates the interplay between NAFLD and cardiovascular/cerebrovascular diseases and highlights prevailing sex/racial disparities in outcomes warranting tailored care.

Table 1. **Multivariable Odds of Major Adverse Cardiac and Cerebrovascular Events in NAFLD patients by Age, Sex, and Race, 2019**

Categories	MACCE	All cause mortality	Acute MI	Cardiac arrest	Stroke
18-44	ref	ref	ref	ref	ref
45-64	2.31 (2.06-2.59)	3.00 (2.42-3.72)	2.23 (1.87-2.66)	2.08 (1.55-2.80)	1.90 (1.52 – 2.38)
>=65	3.01 (2.61-3.47)	4.13 (3.11-5.48)	2.81 (2.29-3.45)	2.24 (1.52-3.31)	2.58 (1.96-3.39)
	p< 0.001	p< 0.001	p< 0.001	p< 0.001	p< 0.001
Male vs Female	1.22 (1.14-1.30)	1.04 (0.92-1.18)	1.35 (1.24-1.48)	1.54 (1.26-1.88)	1.04 (0.91-1.19)
P-values	< 0.001	0.539	< 0.001	< 0.001	0.579
White	ref	ref	ref	ref	ref
Black	1.00 (0.90-1.11)	0.89 (0.72-1.10)	0.95 (0.81-1.11)	1.16 (0.86-1.57)	1.25 (1.03-1.53)
Hispanic	0.88 (0.79-0.98)	0.69 (0.56-0.85)	0.93 (0.81-1.08)	0.75 (0.55-1.02)	1.07 (0.87-1.31)
API	1.06 (0.86-1.30)	1.18 (0.82 – 1.89)	1.06 (0.81-1.38)	0.77 (0.42-1.43)	0.99 (0.69-1.42)
NA	1.14 (0.81-1.61)	1.64 (1.04-2.60)	0.91 (0.53-1.56)	0.74 (0.25-2.15)	0.84 (0.41-1.81)
Others	1.11 (0.92 -1.34)	0.91 (0.62-1.33)	1.33 (1.06-1.67)	1.05 (0.62-1.78)	0.99 (0.68-1.45)
P-values	0.125	0.001	0.121	0.272	0.377

MACCE - Major Adverse Cardiovascular and Cerebrovascular Events API - Asian Pacific Islanders NA - Native Americans.
Multivariate regression models were adjusted for Age, sex, race, household income quartile, payer status, type of admission, hospital bed size, location/teaching status, region, comorbidities including HTN DM HLD obesity, smoking, PVD, PriorMI PriorPCI PriorCABG, drug abuse, prior stroke/TIA, prior VTE.

S900

Risk Factors for Bowel Obstruction in Ulcerative Colitis Patients

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Introduction: Bowel obstruction is one of the possible complications of inflammatory bowel disease. Although there is extensive literature discussing obstructions in patients with Crohn's disease (CD), there is a paucity of similar literature for ulcerative colitis (UC). This study aims to identify patient risk factors for developing a bowel obstruction, in a cohort of patients with UC.
Methods: In a retrospective database study, the 2017 National Inpatient Sample (NIS) was queried for patients with a diagnosis of UC, while excluding patients with a concomitant diagnosis of CD via ICD-10 codes. Patients with bowel obstruction were identified via ICD-10 codes. Univariate logistic regression analysis was performed to identify patient demographics and comorbidities associated with having a bowel obstruction. Multivariable logistic regression analysis was then performed for each significant comorbidity from the univariate analysis, while controlling for patient demographics.
Results: Of the 25,150 UC patients meeting inclusion criteria, 1537 (6.1%) had a bowel obstruction. On univariate analysis, male patients (OR 1.21, 95% CI 1.10–1.35, p < 0.001) and those older than 60 years (OR 1.13, 95% CI, 1.02–1.25, p=0.025) were at increased odds for developing an obstruction. Hispanic patients (OR 0.65, 95% CI 0.52–0.81, p < 0.001) had decreased odds for developing an obstruction. On multivariable analysis, the following comorbidities were significantly associated with developing an obstruction: pulmonary hypertension (OR 2.01, 95% CI 1.34–3.02, p < 0.001), metastatic cancer (OR 1.67, 95% CI 1.23–2.27, p < 0.001), weight loss (OR 1.84, 95% CI 1.61–2.11, p < 0.001), fluid and electrolyte disorders (OR 1.45, 95% CI 1.30–1.61, p < 0.001), and solid tumor without metastasis (OR 1.30, 95% CI 1.01–1.79, p=0.048). (Table)
Conclusion: In a cohort of inpatients with UC, 6.1% had bowel obstructions. UC patients that are male, older than 60 years, or have cancer, pulmonary hypertension, fluid and electrolyte disorders, or weight loss are at greater risk for developing an obstruction. Conversely, UC patients that are Hispanic are less likely to develop obstructions. Patients with cancer might be at elevated risk to develop obstructions due to direct compression of the bowel lumen from tumors and adhesions from previous surgeries to excise tumors. Additionally, older patients and patients with significant fluid and electrolyte disorders are at risk of functional obstruction.

Table 1. Univariate and Multivariable Logistic Regression Analyses of Comorbidities Independently Associated with Developing Intestinal Obstruction in a Cohort of Inpatients with Ulcerative Colitis

Category	Incidence of Obstruction	Univariate Binary Logistic Regression			Multivariable Binary Logistic Regression*		
		Odds Ratio	95% CI	P-value	Odds Ratio	95% CI	P-value
Cohort (n=25,150)	6.1%						
Age							
≤ 60 yrs.	5.8%	Ref.					
> 60 yrs.	6.5%	1.13	1.02-1.25	**0.025**			
Sex							
Female	5.6%	Ref.					
Male	6.5%	1.21	1.10-1.35	< **0.001**			
Race							
White	6.3%	Ref.					
Black	5.5%	0.86	0.72-1.04	0.120			
Hispanic	4.1%	0.65	0.52-0.81	< **0.001**			
Other	6.1%	0.92	0.72-1.18	0.499			
Primary Expected Payer							
Medicare	6.3%	Ref.					
Medicaid	4.6%	0.73	0.61-0.87	< **0.001**			
Private Insurance	6.6%	1.05	0.94-1.18	0.385			
Self-Pay	3.4%	0.53	0.36-0.77	< **0.001**			
Other	7.7%	1.15	0.86-1.55	0.348			
Median Household Income							
Lowest Quartile	5.8%	Ref.					
Second Quartile	5.8%	0.99	0.85-1.16	0.936			
Third Quartile	6.6%	1.14	0.98-1.32	0.095			
Highest Quartile	6.2%	1.07	0.92-1.25	0.368			
Comorbidities							
Pulmonary Hypertension	11.9%	2.10	1.42-3.11	< **0.001**	2.01	1.34-3.02	< **0.001**
Metastatic Cancer	10.7%	1.88	1.40-2.52	< **0.001**	1.67	1.23-2.27	< **0.001**
Weight Loss	9.9%	1.87	1.64-2.12	< **0.001**	1.84	1.61-2.11	< **0.001**
Fluid & Electrolyte Disorders	7.4%	1.45	1.31-1.61	< **0.001**	1.45	1.30-1.61	< **0.001**
Solid Tumor, No Metastasis	8.1%	1.36	1.01-1.83	**0.043**	1.30	1.01-1.79	**0.048**
Peripheral Vascular Disease	7.6%	1.28	1.04-1.57	**0.021**	1.20	0.96-1.49	0.102
Coagulopathy	7.5%	1.26	1.04-1.53	**0.019**	1.21	0.99-1.48	0.070
Liver Disease	6.9%	1.15	0.95-1.40	0.159			
Congestive Heart Failure	6.6%	1.10	0.92-1.32	0.298			
Hypertension	6.4%	1.09	0.99-1.21	0.093			
Neurologic Disorders	6.4%	1.06	0.87-1.28	0.566			
Rheumatoid Arthritis	6.2%	1.01	0.79-1.28	0.947			
Renal Failure	5.8%	0.94	0.79-1.11	0.448			
Drug Abuse	5.8%	0.94	0.70-1.27	0.688			
Deficiency Anemias	5.7%	0.90	0.80-1.02	0.094			
Diabetes	5.9%	0.88	0.77-1.01	0.065			
Alcohol Abuse	5.4%	0.87	0.63-1.20	0.393			
Obesity	5.0%	0.79	0.67-0.94	**0.006**	0.77	0.64-0.92	**0.003**
Psychoses	4.4%	0.70	0.51-0.98	**0.035**	0.79	0.56-1.10	0.159
Chronic Blood Loss Anemia	4.0%	0.63	0.47-0.84	**0.002**	0.60	0.44-0.83	**0.002**

*Covariables: age, sex, race, primary payer status, median household income quartile.

IBD

S901

Rural versus Urban Differences in Inflammatory Bowel Disease (IBD) Hospitalizations: An Analysis of the National Inpatient Sample (NIS)

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Introduction: Inflammatory bowel disease (IBD) is a significant cause of adult hospitalizations in the United States. There are fundamental differences in demographic distribution, socioeconomic status, access to care, and healthcare infrastructure between rural and urban areas in the US. However, very limited data evaluating these differences is available. The study aims to compare outcomes of IBD patients in these two different settings and explore the causes for any observed differences.
Methods: Data obtained from the national inpatient sample (NIS) 2016–2019 database was evaluated for IBD admissions in rural and urban hospitals of the US. The primary outcome assessed was inpatient mortality, while secondary outcomes included odds of developing bowel perforation, septic shock, perianal disease, need for RBC transfusion, total hospital charges (THC), and length of stay (LOS).
Results: A total of 348,469 adult IBD hospitalizations occurred during the study period. Out of this number, 24,044 patients were managed in rural settings, while 324,425 patients were managed in urban settings. The mean age of rural IBD patients was 48 years old while it was 44 years old in urban areas. Rural IBD patients had shorter inpatient LOS (3.94 days vs 5.03 days, $p< 0.001$) and THC ($24,515 vs $48,754, $p< 0.001$) than urban IBD patients. There was no difference between patient groups regarding inpatient mortality, developing septic shock, bowel perforation, need for RBC transfusion, and odds of developing perianal disease.
Conclusion: The current study indicates most IBD care variables assessed between rural/urban settings were not different. However, differences were observed in LOS and THC between rural and urban IBD patients. The high cost of health care in urban settings most likely contributed to observed differences in the THC due to advanced treatments not being readily available in the rural environment. Increased access to subspecialist practices more comforTable with IBD patient care in urban areas also may contribute to a prolonged LOS as they likely deal with more medically complex patients who require advanced diagnostic testing not available at rural institutions. Improved understanding of rural/urban IBD patient severity variations and care access/availability are needed to accurately ascertain the reason behind these differences.

S902

Is Bariatric Surgery a Risk Factor for De Novo IBD Development? A Meta-Analysis

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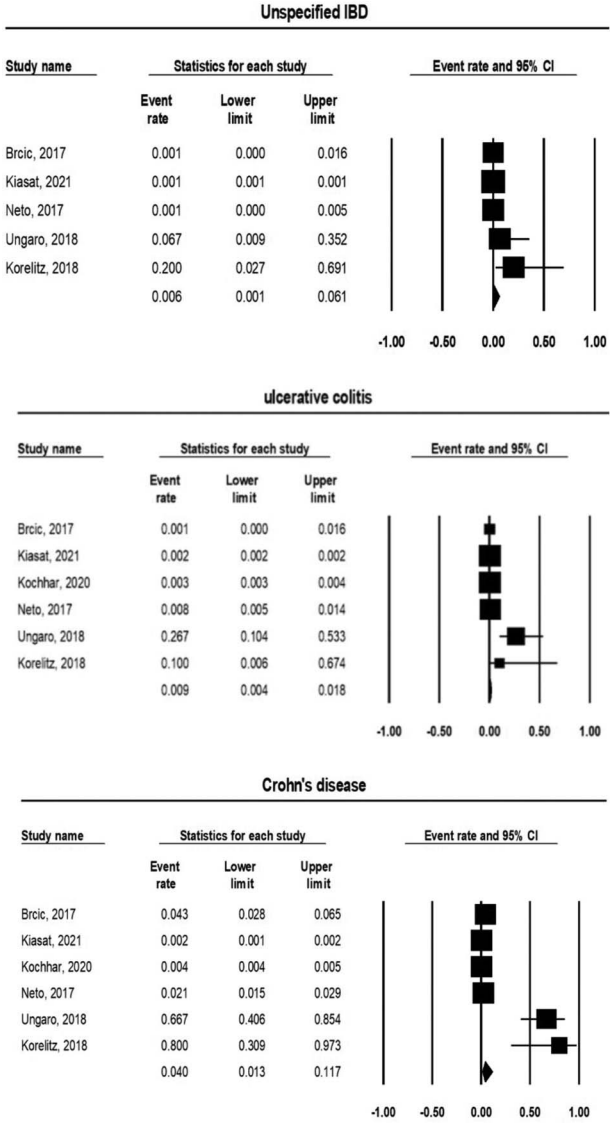
Introduction: The incidence of obesity has been steadily increasing across the globe and many are turning to bariatric surgery (BS) as an effective treatment. The surgeries, however, are associated with both morbidity and mortality. Recently, studies seem to suggest an association between the risk of developing de-novo inflammatory bowel disease (IBD) in patients who underwent BS. This meta-analysis reports on the pooled outcomes of de-novo IBD development in post-BS patients.
Methods: A comprehensive search of several databases was conducted including PubMed, Embase, and ScienceDirect, to identify studies investigating de-novo IBD development in post-BS patients. Standard meta-analysis methods and random effects models were used to calculate the pooled odds-ratio (OR) and mean-difference (MD) with corresponding 95% confidence intervals (CI). I2% statistics was used to assess the heterogeneity. (Figure)
Results: Six studies were included that reported on 142,406 patients that underwent BS. The average reported BMI at time of BS was greater than 45 and average reported age at time of BS was less than 40 years old. The pooled rate of de-novo Crohn's disease (CD), Ulcerative Colitis (UC), and unspecified IBD in patients undergoing BS was 4% (95% CI 1.3-11.7, I2=99%), 0.9% (95% CI 0.4-1.8, I2=95%), and 0.6% (85% CI 0.1-6.1, I2=91%) respectively. The majority of those who developed de-novo IBD were females (74%) and CD (52%) was the most common subtype. (Table)
Conclusion: The results of our meta-analysis indicate an association between BS and de-novo IBD development, especially CD. It has been hypothesized that changes in the intestinal microbiome after bariatric surgery trigger immune responses that lead to the development of IBD in genetically susceptible individuals. However, some have suggested that these findings may be due to the association between IBD and obesity, by unknown mechanism. Additional research is needed to further validate our findings.



[0902] **Figure 1.** Forest plot

Table 1. Summary of pooled rates

De-novo IBD in patients after bariatric surgery	
	Pooled rates (95% confidence interval, I2 heterogeneity)
Ulcerative colitis	0.9% (0.4-1.8, 95%)
Crohn's disease	4% (1.3-11.7, 99%)
Unspecified IBD	0.6% (0.1-6.1, 91%)

S903

The Impact of Immunosuppression for Immune Checkpoint Inhibitor Colitis on Cancer Outcome

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Introduction: Immune checkpoint inhibitors are becoming a staple in the management of certain types of cancer. However, they may give rise to immune-related adverse events (irAEs). In particular, gastrointestinal irAEs may sometimes necessitate extended periods of steroid use and initiation of biologic agents. In this study, we aim to explore the impact of immunosuppression use and duration on cancer progression and progression-free survival (PFS).
Methods: This is a single center retrospective review in patients taking ICIs who developed gastrointestinal irAEs within one year of ICI initiation. The study window for data collection ranged from May 2011 to June 2020. Data was analyzed using IBM SPSS Statistics 26; univariate logistic regression was used to explore the relationship between immunosuppression and cancer progression and COX Hazard analysis was conducted to evaluate progression-free survival. 30 days was used as the cut-off to differentiate between short and long-term steroid use for analysis.
Results: 113 patients were included in this study, 49 of whom did not receive any immunosuppression. All patients developed IMDC, but 16 patients had no colitis symptoms. 23 patients received a short duration of steroids while 41 patients received immunosuppression for longer than 30 days. The development of colitis was associated with less cancer progression by the fourth staging ($p< 0.05$) within the study window while immunosuppression for colitis correlated with less progression by third staging ($p< 0.05$). The multivariate COX analysis found that durations of steroid use (with or without concurrent biologic use) less than 30 days were associated with better progression-free survival (PFS;$p=0.048$). The number of ICI infusions also seemed to correlate with better PFS ($p=0.089$).
Conclusion: The impact of immunosuppressive treatment on cancer outcomes has not been well studied. This study found that durations of steroid treatment less than 30 days for ICI colitis showed significantly less cancer progression within one year of ICI treatment, supporting emerging evidence that prolonged steroid use may interfere with immunotherapy efficacy. We also found that the development of colitis and the use of immunosuppression was associated with less cancer progression with a year. This study supports the benefit of GI irAE on cancer outcome and raises concern for the safety of long-term immunosuppression for managing ICI GI toxicities highlighting the need for more extensive research into this particular area.

S904

Burden of Bowel Urgency Across Specific Treatment Groups Among Crohn's Disease Patients: Real World Global Study Analyses

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Introduction: Bowel urgency (BU) is a sudden and immediate need to have a bowel movement, a common symptom in Crohn's disease (CD) patients. The pathophysiology /mechanism of BU in CD is very complex. BU may persist despite treatment for CD and when disease is considered inactive[1-2]. This study explored differences in disease burden among CD patients with BU based on their treatment pathway.
Methods: Data were extracted from the Adelphi Disease Specific Programme for CD[3], a point-in-time survey of gastroenterologists (GIs) and patients from Jan 2020-Mar 2021 in Germany, France, Spain, Italy, UK and US. GIs provided patient demographics, clinical characteristics and treatment history. The same patients were invited to complete the Short Inflammatory Bowel Disease Questionnaire (SIBDQ), EQ-5D and Work Productivity and Activity Impairment (WPAI) questionnaire. Three patient subgroups were identified: never received targeted therapy (biologics and JAK inhibitors) (TT-naïve), receiving first TT currently (1L TT) and receiving TT with prior TT use (TT-exp). Within these groups, patients currently experiencing BU, reported by physicians, with current treatment duration >3 months, were included. ANOVA, chi-square and/or Kruskal-Wallis tests were used to compare across groups.
Results: Of the CD patients in the TT-naïve (n=643), 1L TT (n=994) and TT-exp (n=404) groups, 17%, 13% and 15% experienced BU, respectively (Table). 9% of the TT-naïve group were flaring vs. 15% 1L TT and 29% TT-exp patients ($p=0.0024$). Steroid use was higher in the TT-naïve group (45%) vs. 15% 1L TT and 12% TT-exp ($p< 0.0001$). The patient reported outcome measures indicated substantial and similar quality of life impairment across all patients with BU (Table).
Conclusion: This study confirmed that a substantial proportion of patients with CD across all three groups still experience BU despite receiving treatment. Since BU is known to negatively impact patients' quality of life, there is a therapeutic need to address this symptom.

Table 1. Patients with CD on treatment for >3 months with presence of bowel urgency by treatment groups – physician reported data

	TT-naïve N=110	1L TT N=126	TT-exp N=60	p-value
Age, mean (SD)	37.8 (13.1)	40.0 (13.0)	44.7 (14.1)	0.0059*
Sex, male, n (%)	62 (56.4)	59 (46.8)	30 (50.0)	0.3381
BMI, mean (SD)	23.4 (2.9)	24.0 (3.9)	23.9 (3.5)	0.2910
Smoking status	N=103	N=117	N=59	0.5772
Current smoker, n (%)	28 (27.2)	22 (18.8)	14 (23.7)	
Ex-smoker, n (%)	30 (29.1)	44 (37.6)	20 (33.9)	
Never smoked, n (%)	45 (43.7)	51 (43.6)	25 (42.4)	
Flare status: Currently flaring, n (%)	N=103 9 (8.7)	N=115 17 (14.8)	N=58 17 (29.3)	0.0024*
Current treatment: Steroids, n (%)	N=110 50 (45.4)	N=126 19 (15.1)	N=60 7 (11.7)	< 0.0001*
SIBDQ[1]: Total score, mean (SD)	N=53 49.0 (8.5)	N=37 47.9 (14.7)	N=30 45.4 (11.9)	0.3873
EQ-5D: VAS[2], mean (SD)	N=55 76.3 (13.6)	N=39 71.6 (21.0)	N=30 71.8 (13.6)	0.2893
WPAI: Activity impairment, mean % (SD)	N=53 27.2 (16.2)	N=38 31.1 (27.0)	N=27 29.3 (20.0)	0.6839
WPAI: Absenteeism[3], mean % (SD)	N=29 1.1 (4.1)	N=19 11.7 (31.4)	N=17 3.9 (6.7)	0.1247
WPAI: Presenteeism[3], mean % (SD)	N=38 24.5 (15.0)	N=21 19.0 (14.1)	N=18 25.0 (14.7)	0.3332
WPAI: Overall work impairment[3], mean % (SD)	N=29 26.4 (17.5)	N=17 22.0 (15.6)	N=17 27.9 (16.2)	0.5582

SD – standard deviation; BMI – body mass index; SIBDQ – Short Inflammatory Bowel Disease Questionnaire; VAS – Visual analogue scale; WPAI – Work Productivity and Activity Impairment.
[1]Scores range from 10 – 70, with higher scores indicating better health related quality of life.
[2]Scores range from 0 – 100, with higher scores indicating better health related quality of life.
[3]Includes working patients only with known data.
*statistical significance of $\alpha= 0.05$.

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S905

Multidisciplinary Inflammatory Bowel Disease Conference: The Contribution and Impact of Expert Gastrointestinal Pathologist on Patient Care

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Introduction: Inflammatory bowel disease (IBD) is complex, easily misdiagnosed and mismanaged. Multidisciplinary care improves patient outcomes. Yet, few hospitals have a multidisciplinary team approach to IBD care that consistently includes a gastrointestinal expert pathologist. This study aims to quantify the impact an expert pathologist has on a multidisciplinary team in the care of difficult IBD patients.
Methods: A retrospective chart analysis was performed on patients (N = 283) discussed at the semi-monthly multidisciplinary IBD conference at Carilion Clinic, from June 1, 2013 through December 31, 2019. Each patient was presented between one and six times at the conference. Data collected: diagnosis before and after conference, reason for change in diagnosis, endoscopy findings, medications, surgeries, and if clinical remission was achieved within 6 months after conference.
Results: Significantly, after the first conference, 42% of patients presented had a change in diagnosis: 84% due to expert pathologist interpretation, 12% due to radiology, and 4% due to other reasons. The majority of diagnostic changes after the second (73%), third (67%), and fourth (100%) conferences were also attributed to pathology (Table). Crohn disease was the most common new diagnosis after conference, and indeterminate colitis was the most commonly changed diagnosis. For patients whose diagnoses changed to ulcerative colitis after conference, most had moderate active colitis (54%), whereas for those who changed to Crohn disease, the severity of colitis was distributed similarly between none (22%), mild (26%), moderate (28%), and severe (24%). Approximately 24% to 35% of patients had a change in IBD medication after the first, second, and third conferences, among which ~34% to 40% had a change in diagnosis. Following the conference, ~17% to 20% of patients underwent surgical intervention, among which ~12% to 27% had a change in diagnosis. A majority of these patients achieved clinical remission within 6 months of the conference.
Conclusion: The majority of diagnostic changes made at the multidisciplinary IBD conference were due to histopathologic re-interpretation. A change in diagnosis at times led to significant modifications in disease management through surgery or medication changes. Multidisciplinary care teams are essential to the best management of difficult IBD patients. An expert gastrointestinal pathologist is a critical team member to the discussion of nuances of each patient's case.

Table 1. Summary of Change in Diagnosis and the Reason that Diagnosis was Changed

	Change in Diagnosis				
	Yes				No
Conference Number	Total	Pathology	Radiology	Other	
First (N=283)	119 (42.0%)	100 (84.0%)	14 (11.8%)	5 (4.2%)	164 (58.0%)
Second (N=82)	26 (31.7%)	19 (73.1%)	6 (23.1%)	1 (3.8%)	56 (68.3%)
Third (N=19)	3 (15.8%)	2 (66.7%)	1 (33.3%)	0	16 (84.2%)
Fourth (N=7)	1 (14.3%)	1 (100.0%)	0	0	6 (85.7%)
Fifth (N=2)	0	0	0	0	2 (100.0%)
Sixth (N=1)	0	0	0	0	1 (100.0%)

S906

Survey on Medical Marijuana Use in IBD Patients in Oklahoma Before and After Legalization

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Introduction: There is an increasing interest among patients and providers in the use of cannabis and its derivatives to treat several chronic illnesses, including Inflammatory Bowel Disease (IBD) and its symptoms. In this study, we aimed to evaluate the prevalence and patterns of cannabis use for IBD in the state of Oklahoma. In addition, we examined patient's experiences and attitudes towards cannabis since its legalization in 2018.
Methods: An anonymous cross-sectional survey was conducted, evaluating current and previous cannabis use in adult patients with confirmed diagnosis of Crohn's Disease (CD) and Ulcerative Colitis (UC) who were followed at the University of Oklahoma Gastroenterology Clinics. Data was captured between August 1, 2021 and March 4, 2022.
Results: A total of 49 patients were included in the final analysis. Among those, 30 patients (61.2 %) reported history of cannabis use. Nonwhite patients (89.5% vs 72.4%, p=0.16), patients from a lower socioeconomic status (79.3% vs 57.9%, p=0.11) and patients with a history of psychiatric disorder, most commonly anxiety, (46.7% vs 21.1%, p=0.07) were more likely to report cannabis use. Nearly 48% (12/25) reported cannabis use daily. About half the patients (53.6%, 14/26) obtained cannabis from medical dispensaries. Cannabis was used for relief of IBD symptoms in 46.4 % (13/28) and 63.6% (14/22) reported at least some relief of their symptoms, especially abdominal pain. When asked how legalization affected their use of cannabis, 44% (11/25) reported no change in the amount used and 24% (6/25) reported increased use. Hyperemesis (24.0%, 6/25) and anxiety (12.0%, 3/25) were the most commonly reported side effects among users.
Conclusion: Our study assessing cannabis use for IBD is the first of its kind in the state of Oklahoma. It shows that cannabis use is common among patients with IBD and many patients perceive medical benefit for IBD related symptoms. It also highlights the persistent social, religious and cultural stigma associated with cannabis use. Further studies are needed to validate these perceived benefits of medical cannabis use in patients with IBD and assess its safety profile. (Table)

Table 1. Demographic, socioeconomic, IBD characteristics grouped by history of cannabis use

	Reported history of marijuana use (n=30)	No reported history of marijuana use (n=19)	P-value
Age, mean ± SD	48.2±38	49.2±20.1	0.92
Female Sex, n (%)	18/29 (62.2)	13/19 (68.4)	0.65
White race, n (%)	21/29 (72.4)	17/19 (89.5)	0.16
High school degree, n (%)	22/29 (75.9)	14/19 (73.7)	0.71
Unemployed or Income < 30K/yr, n(%)	23/29 (79.3)	11/19 (57.9)	0.11
History of psychiatric illnesses, n (%)	14/30 (46.7)	4/19 (21.1)	0.07
Smoking history, n (%)	7/28 (25.0)	4/17 (23.5)	0.91
Alcohol, n (%)	20/30 (66.7)	10/19 (52.6)	0.33
Illicit drug, n (%)	1/30 (3.3)	0/19 (0)	0.42
IBD diagnosis			0.89
UC, n (%)	10/30(33.3)	6/19 (31.6)	
Crohn's, n(%)	18/30 (60.0)	11/19 (57.9)	
Non-specificed n (%)	2/30 (6.7)	2/19 (10.5)	
Duration of IBD			0.21

Table 1. (*continued*)

	Reported history of marijuana use (n=30)	No reported history of marijuana use (n=19)	P-value
< 5 years	10/30 (33.3)	9/19 (47.4)	
5-10 years	10/30 (33.3)	2/19 (10.5)	
> 10 years	5/30 (16.7)	2/19 (10.5)	
> 15 years	4/30 (13.3)	6/19 (31.6)	
Extra intestinal manifestation, n (%)	22/30 (73.3)	15/17 (88.2)	0.23
Hx of resection, n (%)	4/29 (13.0)	6/19 (31.6)	0.23
IBD activity			0.41
Clinical remission, n (%)	6/29 (20.7)	6/18 (33.3)	
Mild, n (%)	12/29 (41.4)	6/18 (33.3)	
Moderate, n (%)	8/29 (27.6)	6/18 (33.3)	
Severe, n (%)	3/29 (10.3)	0/18 (0)	
IBD hospitalizations			0.64
1-2, n (%)	17/30 (56.7)	11/17 (64.7)	
3-4, n (%)	1/30 (3.3)	0/17 (0)	
4-5, n (%)	1/30 (3.3)	0/17 (0)	
5-6, n (%)	2/30 (6.7)	0/17 (0)	
No hospitalizations, n (%)	9/30 (30.0)	6/17 (35.3)	
Stool frequency			0.45
Normal, n (%)	11/30 (36.7)	7/19 (36.8)	
1-2/day, n (%)	9/30 (30.0)	3/19 (15.8)	
2-5/day, n (%)	7/30 (23.3)	8/19 (42.1)	
5/day, n (%)	3/30 (10.0)	1/19 (5.3)	
Abdominal pain			0.63
< 1/week, n (%)	10/30 (33.3)	4/19 (21.1)	
2-3 times/week, n (%)	7/30 (23.3)	4/19 (21.1)	
Daily, n (%)	9/30 (30.0)	6/19 (31.6)	
Never, n (%)	4/30 (13.3)	5/19 (26.3)	
Appetite			0.42
Normal, n (%)	17/30 (56.7)	11/19 (57.9)	
Reduced, n (%)	13/30 (43.3)	7/19 (36.8)	
Increased, n (%)	0/30 (0)	1/19 (5.3)	
Weight loss			0.83
> 5 pounds, n (%)	7/30 (23.3)	3/19 (15.8)	
< 5 pounds, n (%)	3/30 (10.0)	2/19 (5.3)	
No weight loss, n (%)	15/30 (50.0)	11/19 (57.9)	
Subjective weight loss, n (%)	5/30 (16.7)	4/19 (21.1)	

S907

Awareness and Perceptions of Colorectal Cancer Risk and Screening in Inflammatory Bowel Disease

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Introduction: Patients with inflammatory bowel disease (IBD) are at higher risk of developing colorectal cancer (CRC). Guidelines recommend periodic endoscopic surveillance to detect and manage dysplasia. We aimed to explore patient knowledge and perceptions of CRC risk and colonoscopic surveillance.
Methods: A 44-item questionnaire was administered to IBD patients with colonic involvement attending gastroenterology clinics between July 2021 and April 2022.
Results: Of 418 respondents, 266 (64%) had ulcerative colitis and 145 (34%) had Crohn's disease, with 176 (42%) diagnosed for ≥10 years. Two hundred and sixty-five (66%) patients rated their IBD control moderate/good (score ≥7/10), and 314 (75%) self-rated their understanding of IBD as good/excellent. Two hundred and ninety-eight patients (71%) recognised that CRC risk is higher in IBD but 83 (20%) felt the risk of CRC was lower in IBD or were unsure. Age (p=0.02), being a Crohn's and Colitis UK (CCUK) member (p< 0.001), patient rated IBD control (p=0.04) and self-rated understanding (p=0.01) were associated with better CRC risk awareness. One hundred and forty-nine (36%) respondents stated that their IBD healthcare professional (HCP) had previously discussed CRC risk with them; this was associated with better CRC knowledge (p=0.001). On multivariate analysis CCUK membership (OR 2.75; 95% CI 1.57- 4.83; p< 0.001), prior HCP discussion (OR 1.57; 95% CI 0.85-2.87; p=0.01) and age ≥65 years (OR 0.3; 95% CI 0.09- 0.99; p=0.05) were predictive of greater CRC risk awareness. Concerning the most appropriate screening test for dysplasia, 369 patients (88%) stated colonoscopy, but only 29 (7%) were aware that colonic surveillance should commence 8-10 years after diagnosis; 153 (37%) recognised that optimal timing is when IBD is in remission. Patient reported information sources included gastroenterology HCPs (43%), patient support groups (28%), and patient leaflets (17%). The majority (78%) stated they would agree to have surveillance colonoscopy. Bowel preparation (50%) and discomfort (45%) were factors most likely to dissuade them from agreeing to surveillance.
Conclusion: Patient knowledge of CRC risk and surveillance practice in IBD is variable. Modifiable factors associated with improved knowledge are discussion with HCPs and CCUK membership. Our findings underscore the need for better patient education to aid informed decision-making between patients and HCPs and improve adherence to colonoscopic surveillance.

S908

Characteristics and Outcomes of Patients With Inflammatory Bowel Disease Admitted to High vs Low Safety Net Burden Hospitals: A Nationwide Analysis

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Introduction: Inflammatory bowel disease (IBD), is a chronic relapsing inflammatory disorder that requires a meticulous multidisciplinary management approach. This may prove difficult in safety net hospitals, and it is unclear if a hospital's safety net burden (SNB) is associated with outcomes. The aim of this study was to investigate the effect of hospital SNB on in-hospital mortality, length of stay, and hospitalization cost in patients with IBD.
Methods: We used the National Inpatient Sample (NIS) to identify all adult hospitalizations with IBD from 2016 to 2018. SNB was calculated as the percentage of hospitalizations with Medicaid or uninsured payer status for each hospital in the 2016-2018 database. Multivariable models were used to compare outcomes of admissions to hospitals with low SNB (lowest tertile, < 18.1%) hospitals with high SNB (highest tertile, >31.1%).
Results: The demographic and clinical characteristics for the 106,603 patients hospitalized with IBD are shown in Table. Of all patients, 42.3% were admitted to low SNB hospitals and 57.7% were admitted to high SNB hospitals. The main study outcomes (in-hospital mortality, length of stay, and cost) are also shown in Table. In-hospital mortality was 1.4% in low SNB hospitals and 1.6% in high SNB hospitals (adjusted OR=1.15, 95% CI 1.03-1.29, p=0.016). Mean length of stay was longer in high SNB hospitals compared to low SNB hospitals (5.6 vs 5.1 days, adjusted mean difference 0.38 days, p< 0.0001). Low SNB hospitals had higher hospitalization costs compared to high SNB hospitals ($15,968 vs $15,670, adjusted mean difference $402, p=0.01).
Conclusion: In this large population of inpatients with IBD, patients admitted to high SNB hospitals had overall worse hospital mortality and longer length of stay. Patients admitted to low SNB hospitals had higher hospital costs. Further research is needed to clarify the cause of these discrepant outcomes in IBD hospitalizations, and specific interventions are needed to improve the delivery of care to IBD patients in high SNB hospitals.

Table 1. Demographic, clinical, and hospital characteristics and outcomes of admissions with inflammatory bowel disease (n=106,603) stratified by safety net burden (SNB), National Inpatient Sample database, 2016-2018

	Low SNB N=45,144	High SNB N=61,459	
Patient Characteristics			
Age, mean (SD), y	55.9 (19.1)	51.2 (18.9)	< .0001
Sex, n (%)			0.0263
Female	25,098 (55.6)	34,591 (56.3)	
Male	20,028 (44.4)	26,848 (43.7)	
Race			< .0001
White	35,576 (82.9)	42,577 (70.6)	
African American	3,451 (8.0)	9,433 (15.6)	
Hispanic	1,990 (4.6)	5,613 (9.3)	
Other	1,892 (4.4)	2,659 (4.5)	
Type of IBD			
Ulcerative Colitis	18,387 (40.7)	22,634 (36.8)	< .0001
Crohn's	27,046 (59.9)	39,150 (63.7)	< .0001
Medical comorbidities, n (%)			
Smoking	395 (0.9)	831 (1.4)	< .0001
Alcohol	1,084 (2.4)	2,157 (3.5)	< .0001
Clostridioides difficile	2,105 (4.7)	2,981 (4.9)	0.1558
Bowel perforation	379 (0.8)	508 (0.8)	0.8178
Severe sepsis with shock	1,805 (4.0)	2,681 (4.4)	0.0035
Blood transfusion	2,758 (6.1)	3,678 (6.0)	0.3977
Primary payer, n (%)			< .0001
Medicare	20,030 (44.5)	23,608 (38.5)	
Medicaid	3,713 (8.2)	13,328 (21.7)	
Private	19,675 (43.7)	18,745 (30.5)	
Self-pay, no charge, other	1,638 (3.6)	5,705 (9.3)	
Hospital location			< .0001
Urban	42,706 (94.6)	56,353 (91.7)	
Rural	2,438 (5.4)	5,106 (8.3)	
Outcomes			
Length of stay, mean (SD)	5.1 (6.1)	5.6 (7.5)	< .0001
In hospital mortality	642 (1.4)	953 (1.6)	0.016
Total hospital costs, mean/median	$15968/$9952	$15670/$9449	0.01

S909

C-Reactive Protein Is Not a Reliable Biomarker to Assess the Severity and Response of Immune-Mediated Diarrhea and Colitis

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Introduction: C-reactive protein (CRP) is an inflammatory marker used to stratify and monitor disease in many inflammatory conditions. However, CRP level is not specific to any organ system and is widely influenced by various factors nonspecific to bowel inflammation. Fecal calprotectin has recently been shown as a specific biomarker in evaluating and monitoring immune-mediated diarrhea and colitis (IMDC) disease response. We aimed to study the utility of CRP as a predictor of disease severity and of response in IMDC.
Methods: We performed a retrospective cohort study of patients diagnosed with IMDC and had CRP measured at disease onset and after IMDC treatment with biologics between 7/01/2015 and 8/30/2021 at MD Anderson Cancer Center. Patient demographics, clinical characteristics, and IMDC data were collected and analyzed.
Results: Our sample of 128 patients had a median age of 67 years and majority were male (84%) and Caucasian (90%). Fifteen (12%) were initially treated with CTLA-4, 41 (32%) with PD-(L)1, and 71 (56%) with a combination of both prior to development of IMDC. At the time of IMDC diagnosis, there was no significant difference in CRP level by CTCAE grade of diarrhea (p=0.274), CTCAE grade of colitis (p=0.991), or endoscopic findings (p=0.385). While CRP levels decreased after IMDC treatment (p< 0.001), there remained no significant difference in CRP levels amongst those who did or did not achieve clinical remission (p=0.485), endoscopic remission (p=0.467), or histologic remission (p=0.303). There also was no significant relationship between CRP level and recurrence of IMDC (p=0.473).

Conclusion: CRP level is not a favorable surrogate marker to provide accurate assessment on IMDC severity, treatment response, or disease recurrence. Despite the reduction of CRP levels observed following IMDC treatment, this finding is deemed non-specific and potentially confounded by concurrent clinical factors such as underlying malignancy status or non-colitis processes and treatments. Further studies are warranted to investigate the role of CRP in cancer patients with IMDC.

S910

Iron Deficiency Is Common After Total Proctocolectomy With Ileal Pouch Anal Anastomosis in Patients With Ulcerative Colitis

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Introduction: Approximately 10-15% of patients with ulcerative colitis (UC) complicated by medically refractory disease or dysplasia will require surgery, the most common of which is the staged total proctocolectomy (TPC) with ileal pouch anal anastomosis (IPAA). Micronutrient deficiencies may occur after TPC with IPAA due to malabsorption in the setting of pouch inflammation. The aim of this study was to report the incidence of iron deficiency anemia in patients with UC who underwent TPC with IPAA and identify associated risk factors.
Methods: We conducted a retrospective chart review at a single, tertiary-care IBD center. Patients with UC or IBD unclassified (IBDU) who underwent TPC with IPAA at Mount Sinai Hospital between 1/ 2008 and 12/2017 were identified. Descriptive statistics were used to analyze the baseline characteristics and labs of the study population. Medians with interquartile range [IQR] were reported for continuous variables and proportions were reported for categorical variables. Iron deficiency was defined by ferritin < 30 ng/mL. Univariable logistic regression was used to analyze unadjusted relationships between hypothesized risk factors and outcomes.
Results: A total of 143 patients underwent iron studies a median of 3.0 [IQR 1.7-5.6] years after final surgical stage. Of these, 73 were men and the median age was 33.5 [IQR 22.7-44.3] years. The pouch-anal anastomosis was stapled in 100 (69.9%) patients and handsewn in 43 (30.1%). The median rectal cuff length was 1.5 cm [1-2]. The following median values were noted in the 143 patients: hemoglobin 13.2 g/dL [12.0-14.3], mean corpuscular value 86 fl [81.6-90.5], iron 59.5 mcg/dL [34.0-84.0], ferritin 39 ng/mL [17.0-79.5]. Iron deficiency was diagnosed in 80 (55.9%) patients with a median hemoglobin of 12.4 g/dL [10.9-13.3], ferritin of 14 ng/mL [9.0-23.3], and iron of 44 mcg/dL [26.0-68.8]. Of these, 29 (36.3%) had a pouchoscopy performed within three months of iron deficiency diagnosis. Pouchitis and cuffitis were separately noted in 4 (13.8%) and 13 (44.8%) patients, respectively, and concomitant pouchitis-cuffitis was noted in 9 (31.0%) patients. Age, sex, anastomosis type, pouch duration, and history of pouchitis and/or cuffitis were not predictive of iron deficiency.
Conclusion: Iron deficiency is common after TPC with IPAA in patients with UC. Cuffitis is seen in the majority of patients with iron deficiency.

S911

Real World Outcomes of Tofacitinib for Ulcerative Colitis at 52 and 78 Weeks

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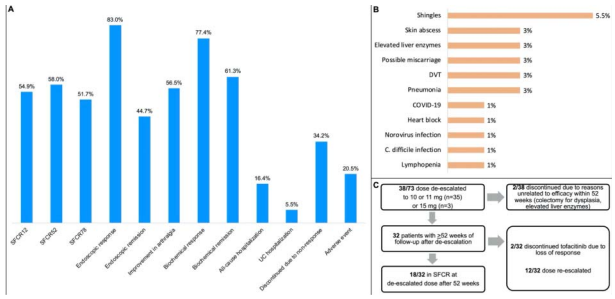
Introduction: Tofacitinib (tofa) is an oral small molecule JAK inhibitor for the treatment of ulcerative colitis (UC). We performed a retrospective cohort study to assess clinical outcomes up to 78 weeks after tofa initiation for UC in a real-world setting.
Methods: This study included adults initiating tofa therapy between 5/1/18-4/1/21 at a large, US academic medical center. Electronic health records were manually reviewed for clinical data. The primary outcome was steroid-free clinical remission (SFCR; i.e. simple clinical colitis activity index ≤ 2 or per provider global assessment and no use of oral/IV corticosteroids for ≥ 30 days) at 12, 52, and 78 (+/-4) weeks. Secondary outcomes were endoscopic response (decrease in Mayo endoscopic subscore by ≥ 1 pt) and remission (Mayo endoscopic subscore 0) at >8 weeks, biochemical response (improvement in elevated C-reactive protein [CRP] or fecal calprotectin [FC] by $>25\%$ from baseline) and remission (normalized CRP or FC) at >8 weeks, and dose de-escalation, improvement in arthralgia, colectomy, hospitalization, adverse events (AEs), and treatment discontinuation during follow-up. Continuous data were reported as medians with interquartile range (IQR) due to normality and categorical data were reported as proportions.
Results: 73 patients initiated tofa with median follow-up of 88 weeks (IQR 40.9-151.0 weeks). 60.2% were female, 54.7% had prior exposure to ≥ 2 anti-tumor necrosis factor agents, 74.0% had prior exposure to vedolizumab, and 54.7% were receiving concomitant oral/IV steroids (Table). Among patients with available data, 31/60 (51.7%) were in SFCR at 78 weeks, 39/47 (83.0%) achieved endoscopic response, and 21/47 (44.7%) achieved endoscopic remission (median time to endoscopy 58.1 weeks, IQR 30.7-103.6 weeks after initiation). Other outcomes are presented in Fig 1A. 31/73 (42.5%) discontinued tofa after a median of 616 days (IQR 286-1057 days) primarily due to non-response (14/31) or colectomy for refractory disease (11/31) and dysplasia (2/31). 15/73 (20.5%) experienced potential AEs during follow-up (Fig 1B), of which 1 (6.7%) required discontinuation (elevated liver enzymes). 38/73 (52.1%) underwent dose de-escalation, among which 18/32 (56.3%) with adequate follow-up were in SFCR at 52 weeks after de-escalation (Fig 1C).
Conclusion: In a real-world refractory UC population, tofa was effective for the majority of patients through 78 weeks. Due to a limited sample size, larger real-world studies are needed to corroborate these findings.



[0911] **Figure 1.** A. Clinical and endoscopic outcomes. Number after SFCR reflects number of weeks. Patients who discontinued therapy due to non-response at earlier endpoints were included in the denominators for later endpoints (i.e. they were considered treatment failures). Denominators for outcomes: SFCR12 n = 71, SFCR52 n = 69, SFCR78 n = 60, endoscopy n = 48, arthralgia n = 23, biochemical n = 30, discontinuation, hospitalization, and adverse events n = 73. Denominators vary due to availability of outcome data. B. Adverse events during all available follow-up. 15 patients reported adverse events, but some reported more than one adverse event (all individual events are included). C. Dose de-escalation outcomes. Dose de-escalation occurred after a median of 36.9 weeks (IQR 20.6-62.3 weeks) from tofacitinib initiation. Abbreviations: SFCR = steroid-free clinical remission , DVT = deep venous thrombosis

Table 1. Baseline characteristics

Characteristic	Value
N	73
Female	44 (60%)
Age, y, median (IQR)	41.2 (28.1, 54.0)
UC duration, y, median (IQR)	9.5 (4.4, 15.5)
Race	
Caucasian	67 (92%)
Black	0 (0%)
Asian	4 (5%)
Other/Unknown	2 (3%)
Hispanic	0 (0%)
Number of prior anti-TNFs	
0	4 (5%)
1	29 (40%)
2	29 (40%)
3	10 (14%)
4	1 (1%)
Prior ustekinumab	8 (11%)
Prior vedolizumab	54 (74%)
Prior 5-ASA	71 (97%)
Current 5-ASA	12 (16%)
Prior immunomodulator	54 (74%)
Current immunomodulator	6 (8%)
Current steroids	
Prednisone/methylprednisolone	33 (45%)
Budesonide	7 (10%)
Current oral contraceptive	6 (8%)
Hypertension	19 (26%)
Hyperlipidemia	13 (18%)
Diabetes	7 (10%)
History of coronary artery disease	5 (7%)
History of cerebrovascular accident	1 (1%)
BMI, median (IQR)	25.6 (21.6, 28.9)
Arthralgia at time of initiation	27 (37%)
Endoscopic extent >E1 (i.e. >proctitis)	62 (85%)
Endoscopic severity	
None	6 (8%)
Mild	9 (12%)
Moderate	38 (52%)
Severe	20 (27%)
Smoking	
Never	59 (81%)
Current	2 (3%)
Former	12 (16%)
Current cannabis use	11 (15%)
Current opioid use	7 (10%)
UC hospitalization within 12 months	19 (26%)
Serum albumin, g/dL, median (IQR)	4.1 (3.8, 4.3)
C-reactive protein, mg/L, median (IQR)	5.1 (1.7, 16.7)
Fecal calprotectin > 120 ug/g	27 (90%)
SCCAI, median (IQR)	5 (3, 8)
Daily bowel movement frequency, median (IQR)	6 (3.5, 10)

Albumin, C-reactive protein, fecal calprotectin, SCCAI, and bowel movements were the most recent values available within 3 months prior to drug initiation. The most recent endoscopic data preceding tofacitinib initiation was used: median 19.1 weeks (IQR 6.1-46.1 weeks) prior to tofacitinib initiation. Abbreviations: IQR = interquartile range, TNF= tumor necrosis factor, ASA = aminosalicylic acid, SCCAI = simple clinical colitis activity index.

S912

Prevention of Venous Thromboembolism in IBD Patients May Not Be Associated With Prophylaxis Rates

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Introduction: Patients with inflammatory bowel disease (IBD) harbor a higher risk of deep venous thrombosis and venous thromboembolism (VTE) compared to healthy individuals. Previous studies, including a large meta-analysis, estimate the risk of VTE incidence to be almost 2-3 times baseline. Guidelines, therefore, recommend VTE prophylaxis in most inpatients with IBD. While previous studies have demonstrated less than ideal adherence with these guidelines, we sought to determine the rate of VTE prophylaxis at an academic medical center.
Methods: A retrospective chart review of inpatients with Crohn's disease or ulcerative colitis admitted to a tertiary medical center in Bronx, NY from 1/2015 to 2/2020 was performed. All patients who were admitted with a primary gynecological or psychiatric disorder, COVID infection, or known hypercoagulable disorder were excluded. Orders for pharmacologic and mechanical VTE prophylaxis at any point during the patient's admission were abstracted. Using ICD10 codes, IBD patients with acute VTE variations were identified. Clinical and demographic variables were analyzed for their association with VTE prophylaxis. Two-sample t-tests and Fisher's exact tests were used as appropriate. A p-value < 0.05 was considered statistically significant.
Results: A total of 1670 patients with IBD were identified among whom 1280 (76.7%) were prescribed either pharmacological or mechanical VTE prophylaxis during their hospital admission. 70 patients were excluded from the analysis of development of VTE because their diagnosis of VTE was prior to their admission date. Older age ($p< .0001$), higher BMI ($p< .0001$), female sex ($p=.001$), having Medicare insurance ($p< .0001$) were associated with VTE prophylaxis ordering (see Table). There was a VTE incidence of 6.2% (n=98/1600) of the IBD patients in our cohort, with 3/388 patients (0.8%) not being prescribed prophylaxis and 95/1212 (7.8%) being prescribed prophylaxis ($p< 0.001$).
Conclusion: Contrary to other studies, we show that VTE prophylaxis rates may not be associated with a reduction in VTE incidence during hospitalization. While bias by indication may be contributing to this finding with those at greatest risk more likely to receive prophylaxis, other factors may be involved. Further studies are warranted.

Table 1. VTE incidence rates and bivariate association of demographical variables with prophylaxis

		VTE Prophylaxis		p-value
	Total (n)	Yes	No	
Demographics	1670			
Age, mean (SD)		61.91 (19.85)	42.73 (24.39)	< .0001
BMI, mean (SD)		28.11 (8.74)	25.60 (6.15)	< .0001
Sex				0.001
Female		726 (56.7)	185 (47.4)	
Male		554 (43.3)	205 (52.6)	
Ethnicity				0.79
Hispanic		502 (39.2)	160 (41.0)	
Not Hispanic		662 (51.7)	194 (49.7)	
Unknown		116 (9.1)	36 (9.2)	
Insurance				< .0001
CMO		5 (0.4)	0 (0)	0.60
Commercial		263 (20.6)	111 (28.5)	0.002
Medicaid		360 (28.1)	170 (43.6)	< 0.0001
Medicare		615 (48.1)	91 (23.3)	< 0.0001
Self-Pay		37 (2.9)	18 (4.6)	0.12
Outcome	1600			
Developed VTE		95 (7.8)	3 (0.8)	-

S913

Association of Myeloproliferative Disorders in Inflammatory Bowel Disease - An Epidemiological, Outcome and Healthcare Utilization Analysis of the National Inpatient Sample Database

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Introduction: Chronic inflammation and a similar genetic & haplotype profile appears to underly the etiology of both inflammatory bowel disease(IBD) & myeloproliferative disorders(MPN). Recent studies show an increased risk of MPN in patients with IBD & vice versa. Few large scale population based studies have investigated the association of IBD patients with MPD including Essential Thrombocythemia(ET),Polycythemia Vera(PV),Chronic myeloid leukemia (CML) & Myelofibrosis (MF). Here, we investigated the National Inpatient Sample (NIS) database, the largest all-payer inpatient database in USA, to study trends of hospitalized IBD patients with MPD.
Methods: We analyzed NIS data for all adults hospitalized with IBD as a principal diagnosis & MPD as the secondary discharge code using validated ICD-9 &10 codes between 2010-19. Descriptive statistics & regression analysis were used to analyze patient characteristics, comorbidities, length of stay(LOS), hospital charges & outcomes in patients with IBD&MPD & those without.
Results: In 2010-19, a total of 3374 of 187227 (1.8%) hospitalizations for IBD were related to MPD. ET was the most common MPD (94.9%), followed by PV (2.1%). Patients with MPD & IBD were slightly younger (median age, 41.12), more African American & Hispanic with Medicaid as their primary insurance. Hospitalized IBD patients with MPD were noted to have higher rates of rectal bleeding (15.95% vs 8.8%, $p< 0.001$); intestinal abscess formation (4.65% vs 3.66%, $p=0.003$) & perforation (1.66% vs 1.24, p value=0.035). There were lower rates of intestinal obstruction (7.44% vs 12.67%, $p< 0.001$) & colectomy (8.62% vs 10.73%, $p< 0.001$) compared to patients without MPD. Patients with MPD & IBD appear to have a higher major & extreme risk of disease severity (42.74% vs 25.62%, $p< 0.001$) & mortality (12.21% vs 9.48%) based on the APRDRG Severity & mortality scores.They also had a longer length of stay, median, 5 days vs 4 days, p value< 0.001; & higher cost per hospitalization, median, 8199.79 $ vs 7110.6$, p value$< 0.001$. (Table)
Conclusion: IBD patients hospitalized with MPD appear to have a higher incidence of rectal bleeding, intestinal perforation and abscess formation along with an increased risk of disease severity & mortality. This relates to a higher LOS & cost per hospitalization. Impaired immune regulation with combined MPN & IBD could be a contributor towards this but further studies are needed to understand how MPD affects severity & risk of complications in hospitalized IBD patients.

Table 1.

	Overall	IBD-MPN	IBD+MPN	
Variable	N = 187,227	N = 183,853	N = 3,374	P Value
Rectal Bleeding	16723 (8.93%)	16185 (8.8%)	538 (15.95%)	< **0.001**
Intestinal Obstruction	23545 (12.58%)	23294 (12.67%)	251 (7.44%)	< **0.001**

Table 1. (*continued*)

Variable	Overall N = 187,227	IBD-MPN N = 183,853	IBD+MPN N = 3,374	P Value
Intestinal Fistula	10669 (5.7%)	10457 (5.69%)	212 (6.28%)	0.149
Intestinal Abscess	6890 (3.68%)	6733 (3.66%)	157 (4.65%)	**0.003**
Colectomy	20013 (10.69%)	19722 (10.73%)	291 (8.62%)	< **0.001**
Peritonitis	507 (0.27%)	493 (0.27%)	14 (0.41%)	0.145
Intestinal Perforation	2334 (1.25%)	2278 (1.24%)	56 (1.66%)	**0.035**

Note. p-values from chi-square to independent samples t-tests.

Variable	Label	Overall N = 187,227	IBD-MPN N = 183,853	IBD+MPN N = 3,374	P Value
Mortality	Alive	186512 (99.67%)	183148 (99.67%)	3364 (99.73%)	0.627
	Died	616 (0.33%)	607 (0.33%)	9 (0.27%)	
LOS, day, median [IQR]		4 [2, 6]	4 [2, 6]	5 [3, 8]	< 0.001
APRDRG Severity	Major/Extreme	48542 (25.93%)	47100 (25.62%)	1442 (42.74%)	< 0.001
	Minor/Moderate	138685 (74.07%)	136753 (74.38%)	1932 (57.26%)	
APRDRG Risk Mortality	Major/Extreme	17837 (9.53%)	17425 (9.48%)	412 (12.21%)	< 0.001
	Minor/Moderate	169390 (90.47%)	166428 (90.52%)	2962 (87.79%)	
Total Cost,$, median [IQR]		7129.81 [4580.68, 12316.36]	7110.6 [4567.87, 12282.43]	8199.79 [5407.92, 14563.4]	< 0.001

S914

Impact of Anti-TNF on the Prevalence of Hepatobiliary and Pancreatic Disorders Associated With Inflammatory Bowel Disease: A Population-Based Study

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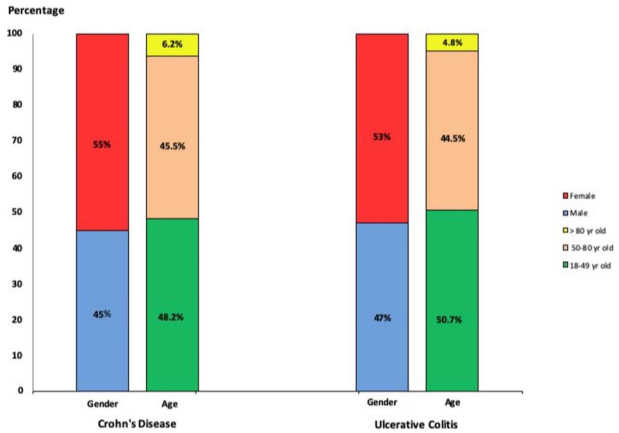
Introduction: Hepatobiliary and pancreatic disorders are common extra-intestinal manifestations in inflammatory bowel diseases (IBD), both in Crohn's Disease & Ulcerative Colitis (UC). Anti-TNF agents have been widely used in the management of IBD and are considered relatively safe. We sought to investigate the impact of anti-TNF on the prevalence of hepatobiliary and pancreatic disorders in IBD patients.
Methods: We used a commercial database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. We identified adults who were diagnosed with either CD or UC between 1999 and 2022 who were treated with any type of anti-TNF agents. We investigated the prevalence of known hepatobiliary and pancreatic disorders in IBD including Autoimmune Hepatitis (AIH), Cholelithiasis, Primary Sclerosing Cholangitis (PSC), portal vein thrombosis (PVT), Cholangiocarcinoma (CCA), and idiopathic pancreatitis (IP) in patients with & without anti-TNF therapy. We also identified patients with CD & UC on anti-TNF who developed lupus (excluding Sulfasalazine).
Results: Out of the 69,260,780 adult patients in the database, we identified 249,480 patients with CD (0.36%) of whom 39280 received anti-TNF (15.7%). In addition, 209,020 with UC (0.30%) of whom 19860 received anti-TNF (9.50%). Figure illustrates demographic characteristics of IBD patients on anti-TNF. CD patients who received anti-TNF were less likely to develop cholelithiasis (OR 0.88 [0.84-0.93]), PVT (OR 0.61 [0.50-0.74]), PSC (OR 0.59 [0.37-0.94)] or CCA (OR 0.50 [0.34-0.73]). Similarly, UC patients who received anti-TNF were less likely to develop cholelithiasis (OR 0.88 [0.79-0.97]), PVT (OR 0.65 [0.52-0.81]), PSC (OR 0.64 [0.44-0.93]), or CCA (OR 0.52 [0.36-0.75]). Both CD & UC groups on anti-TNF have a higher risk of AIH (OR 1.38 [1.13-1.69]) vs (OR 1.27 [1.02-1.58]). Likewise, both groups are at higher risk of IP (OR 1.95 [1.59-2.38] vs (OR 1.79 [1.38-2.31]). Furthermore, patients on CD & UC groups who received anti-TNF are more likely to develop lupus (OR 2.14 [1.59-2.90]) vs (OR 1.92 (1.29-2.84].
Conclusion: In this large retrospective study, we found that IBD patients who were treated with anti-TNF were significantly less likely to develop cholelithiasis, PVT, PSC or CCA. However, a higher risk of AIH and IP is observed in the anti-TNF group. This relationship may reflect an autoimmune side effect of anti-TNF, e.g. lupus-like reactions. Further study is needed to explore potential causality.



[0914] **Figure 1.** Demographic characteristics of IBD patients on anti-TNF

Table 1. Hepatobiliary and pancreatic disorders in CD and UC with anti-TNF therapy

	Crohn's Disease			Ulcerative Colitis		
	Total (Percentage)	On Anti-TNF (percentage)	OR (95% CI)	Total (Percentage)	On Anti-TNF (percentage)	OR (95% CI)
	249,480	39280		209,020	19,860	
AIH	590 (0.23%)	120 (0.030%)	1.38 (1.13-1.69)	790 (0.37%)	90 (0.45%)	1.27 (1.02-1.58)
CCA	350 (0.14%)	30 (0.07%)	0.50 (0.34-0.73)	590 (0.28%)	30 (0.15%)	0.52 (0.36-0.75)
Cholelithiasis	16420 (6.58%)	1560 (3.97%)	0.88 (0.84-0.93)	13030 (6.23%)	430 (2.16%)	0.88 (0.79-0.97)
IP	490 (0.19%)	130 (0.33%)	1.95 (1.59-2.38)	450 (0.21%)	70 (0.35%)	1.79 (1.38-2.31)
PVT	1090 (0.43%)	110 (0.28%)	0.61 (0.50-0.74)	1320 (0.63%)	80 (0.40%)	0.65 (0.52-0.81)
PSC	200 (0.08%)	20 (0.05%)	0.59 (0.37-0.94)	480 (0.22%)	30 (0.15%)	0.64 (0.44-0.93)
Lupus*	210 (0.084%)	60 (0.15%)	2.14 (1.59-2.90)	180 (0.086%)	30 (0.15%)	1.92 (1.29-2.84)

Footnote: OR: Odds Ratio; CI; Confidence Interval; AIH: Auto-immune hepatitis; CCA: Cholangiocarcinoma; IP: Idiopathic Pancreatitis; PVT: Portal vein thrombosis; PSC: Primary Sclerosing Cholangitis.
*Lupus is investigated for correlation with anti-TNF.

S915

Inflammatory Bowel Disease Is a Strong Predictor of Central Line-Associated Blood Stream Infections in Patients Admitted to the ICU

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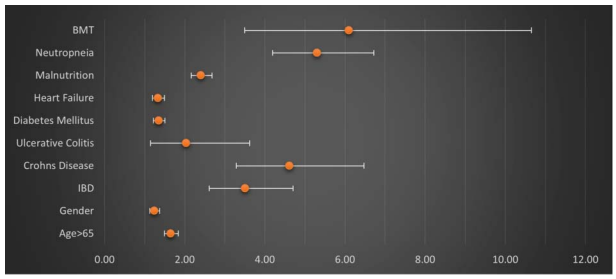
Introduction: Inflammatory bowel disease (IBD) course can be complicated with ICU admission and central line placement for different reasons. One of the common complications of central line placement is central line-associated bloodstream infections (CLABSI).
Methods: A retrospective study was conducted utilizing the Nationwide Inpatient Sample database (NIS) for the years 2016 to 2018. Patients with CLABSI and IBD were identified using ICD 10 diagnosis codes from all listed discharge diagnoses. Patients younger than 18 years of age, and missing information for age, gender, or race were excluded. ICU admission was defined by the presence of vasopressors or mechanical ventilation. Multivariate logistic regression analysis was performed to compare different risk factors in predicting CLABSI.
Results: 3,196,820 patients were included in this study, of those; 7924 (0.24%) had CLABSI. This study reports that adults admitted to the ICU had increased odds of developing CLABSI by three and a half times when they had IBD (OR 3.51, P-value 0.00, 95% CI 2.61-4.70), six times when they had bone marrow transplant (OR 6.10, P-value 0.00, 95% CI 3.49-10.65), and five times when they had neutropenia (OR 5.31, P-value 0.00, 95% CI 4.19-6.72), all were statistically significant. Upon subdividing patients with IBD into Crohn's disease (CD) and ulcerative colitis (UC), we found that patients with CD tend to have high odds of developing CLABSI with OR of 4.61 (P-value 0.00, 95% CI 3.29-6.47) compared to patients with UC who had OR of 2.04 (P-value 0.02, 95% CI 1.15-3.62) and both were statistically significant. (Figure)
Conclusion: This study demonstrates high odds of CLABSI in IBD patients admitted to the ICU compared to patients without such a history. This result can be explained by multiple factors. The fact that patients with IBD are usually treated with immune suppressants can result in a higher incidence of infections including CLABSI. Other etiologies might also include total parenteral nutrition (TPN), as patients with IBD may require TPN as part of their nutritional support while in the ICU. After subdividing patients with IBD into CD and UC, the odds of encountering CLABS tend to be higher in CD, no clear etiology for this finding was found, however, it can be secondary to the transmural involvement of the intestinal wall in CD compared to the submucosal involvement in UC.



[0915] **Figure 1.** Multivariate logistic regression analysis representing odds ratios for different predictors of CLABSI in patients admitted to the ICU. BMT: Bone marrow transplant status. IBD: inflammatory bowel disease. CLABSI: catheter-related bloodstream infections.

S916

Evaluating the Quality and Readability of Online Information Regarding Contraceptive Use in IBD

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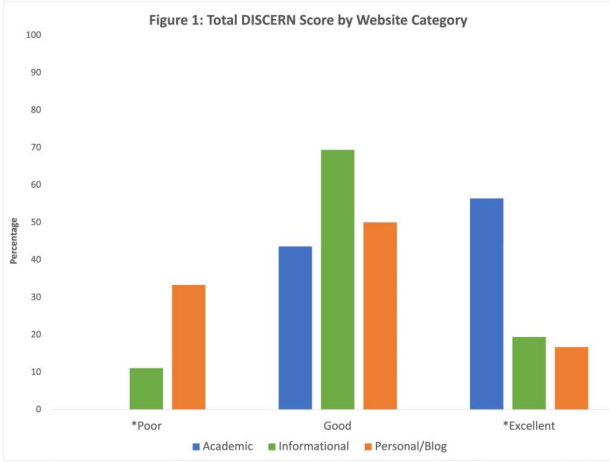
Introduction: Women with inflammatory bowel disease (IBD) are often of childbearing age and discussions about contraception are an important aspect of their healthcare. Patients with IBD are increasingly turning to the internet for their information. This study sought to evaluate the quality and readability of online information related to contraception use in IBD patients.
Methods: Google search engine was used to query "inflammatory bowel disease and contraception" to access the first 100 websites. Websites that were non-accessible, duplicates or videos without transcripts were excluded. Websites were categorized as academic/professional, informational, personal/blog or commercial. Quality of information was determined using the validated DISCERN score. Readability was determined using the validated Flesch-Kincaid Grade Level (FKGL) calculation. Acknowledgment of areas of uncertainty and references cited were noted. Statistical analysis was performed using ANOVA and two-tailed Fisher-Freeman-Halton exact testing with significance set at $p < 0.05$.
Results: Eighty-three of 100 websites met the inclusion criteria. 39(47.0%) were academic, 36(43.4%) informational, 6(7.2%) personal and 2(2.4%) commercial. The average FKGL was 11.7 with a significantly higher grade for academic websites compared to informational or personal (13.4 vs 10.4 and 8.9; p=0.00001). The mean DISCERN was "Good" with a score of 49.0; academic websites had a significantly higher DISCERN than informational or personal (56.3 vs 46.9 and 43.8; p=0.0002). Academic websites had significantly more "Excellent" DISCERN scores than informational or personal (73.3% vs 23.3% and 16.7%; p=0.002) while personal websites had significantly more "Poor" DISCERN scores (33.3% vs 0% and 11.1%; p=0.007) (Figure). Areas of uncertainty (82.1% vs 55.6% and 16.7%; p=0.002) and cited references (100% vs 44.4% and 66.7%; p=0.00001) were addressed more so in academic websites compared to other websites.
Conclusion: Our study shows that academic resources on IBD and contraception are of higher quality than either informational or personal/blog websites; also academic resources present more comprehensive and unbiased information. However, the reading level of all categories, particularly academic, is largely inaccessible to the average consumer. As the use of online resources for contraception in IBD continues to increase, further efforts should focus on developing information that is both more accessible and of higher quality.



[0916] **Figure 1.** Total DISCERN Score by Website Category (* denotes a statistically significant difference in total DISCERN score [Poor, Good, Excellent] among website categories)

S917

Effectiveness and Safety of Weight Loss Medical Therapy in Ulcerative Colitis

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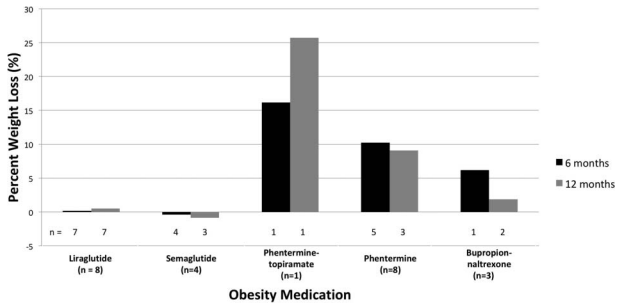
Introduction: The prevalence of obesity in ulcerative colitis (UC) parallels that of the general population and may negatively impact UC outcomes. Options for obesity management in UC have not been well studied. Given the sparse data regarding their use, we sought to review the effectiveness and safety of weight loss medications in the UC population.
Methods: UC patients with prior use of FDA-approved weight loss medication (liraglutide, semaglutide, orlistat, phentermine-topiramate, phentermine, bupropion-naltrexone) were identified via the electronic medical record at Mayo Clinic between January 2001 and January 2022. Retrospective chart review was performed to obtain demographic data, UC and obesity-related history, as well as weight loss, safety, and UC outcomes. UC flare was defined as change or escalation in UC therapy, corticosteroid use, hospitalization, or surgery. Descriptive statistics were utilized for all outcomes.
Results: Twenty-four patients were identified across five FDA-approved weight loss therapies. No patients were identified using orlistat. At baseline, twenty patients (83%) were in clinical remission and seven (29%) were treated with a biologic therapy. The liraglutide, phentermine-topiramate, phentermine, and bupropion-naltrexone groups demonstrated weight loss when evaluating the mean percent weight loss in those with follow-up at 12 months (0.5%, 25.7%, 9.1%, 1.9% respectively) (Figure). Six liraglutide patients (75%) received diabetes dosing. Those receiving adequate obesity dosing achieved 3.2% mean weight loss. Five patients (21%) reported side effects – one of which resulted in therapy discontinuation (Table). One serious adverse event, a cerebrovascular accident, occurred in the phentermine group. A UC flare occurred in two patients receiving semaglutide, both requiring corticosteroids, and one resulting in a change of maintenance therapy. No patients required hospitalization or surgery.
Conclusion: While the liraglutide (particularly those receiving obesity-approved doses), phentermine-topiramate, phentermine, and bupropion-naltrexone groups all lost weight, only those using phentermine-topiramate and phentermine achieved >5% weight loss at 12 months. Reported side effects appeared similar to those of the general population. Although further studies are required to evaluate the efficacy of obesity therapy in UC, it may be a viable adjunct to lifestyle modification, especially in patients who do not qualify for bariatric surgery.



[0917] **Figure 1.** Percent weight loss at 6 and 12 months in ulcerative colitis patients

Table 1. Safety of obesity pharmacotherapy in ulcerative colitis patients

	Liraglutide (n=8)	Semaglutide (n=4)	Phentermine-topiramate (n=1)	Phentermine (n=8)	Bupropion-naltrexone (n=3)
Dose and duration of use					
Maximum dose, mg	1.2 (2/8) 1.8 (4/8) 3.0 (2/8)	0.5 SQ (2/4) 1.0 SQ (1/4) 14 oral (1/4)	15-50 BID	15 (1/8) 30 (1/8) 37.5 (6/8)	16-180 (1/3) 25-150 (1/3) 32-360 (1/3)
Continued use at 12 months, n (%)	7 (87.5)	3 (75)	1 (100)	3 (37.5)	2 (66.7)
Medication-Related Adverse Events					
Side effects, n	1	1	0	3	0
Description of side effects	Diarrhea	Diarrhea	-	Insomnia, constipation, headache	-
Drug discontinuation due to side effects, n	1	0	-	0	-
Serious adverse events (SAEs), n	0	0	0	1	0
Description of SAE	-	-	-	CVA	-
UC-Related Complications					

Table 1. (*continued*)

	Liraglutide (n=8)	Semaglutide (n=4)	Phentermine-topiramate (n=1)	Phentermine (n=8)	Bupropion-naltrexone (n=3)
UC Flare[1], n	0	2	0	0	0
CS use	0	2	0	0	0
Change in IBD therapy	0	1	0	0	0
Hospitalization					
Surgery	0	0	0	0	0
	0	0	0	0	0

CVA: cerebrovascular accident; UC: ulcerative colitis; CS: corticosteroid 1: UC flare defined as increase/change in medication for worsening symptoms or objective evidence of inflammation on endoscopy/imaging, prescription of steroids for flare, hospitalization, or surgery.

S918

Pharmacokinetic Equivalence of Biosimilar Adalimumab-aqvh and Adalimumab in Healthy Subjects

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Introduction: This study assessed the pharmacokinetic (PK) bioequivalence between adalimumab-aqvh, an FDA-approved biosimilar, and the reference product adalimumab after a single dose administered to healthy subjects. Adalimumab is indicated for many inflammatory conditions such as psoriasis as well as inflammatory bowel diseases such as ulcerative colitis and Crohn's disease. Biosimilars are biologic drugs that are highly similar in purity, potency, efficacy, and safety to the reference biologic and are available at lower costs.
Methods: This double-blind, single-dose, parallel-group study randomized healthy subjects (N = 210) 1:1 to receive one 40-mg dose of adalimumab-aqvh or adalimumab. The primary PK endpoints were maximum serum concentrations (C_{max}) and the area under the serum concentration versus time curve extrapolated from 0 to infinity ($AUC_{0\text{-}inf}$) of adalimumab-aqvh versus adalimumab. Other PK endpoints included the time to reach C_{max}, terminal elimination half-life, AUC calculated from 0 to the last measurable concentration, and apparent volume of serum cleared of drug per unit time. Safety and immunogenicity were also assessed.
Results: The C_{max} geometric mean ratio (GMR) was 98.6% (90% CI 90.7–107.3) and the $AUC_{0\text{-}inf}$ GMR was 102.7% (90% CI 92.2–114.3); PK bioequivalence was demonstrated, as both endpoints were contained within the predefined 90% CI GMR range (80%–125%). The other PK endpoints were similar between adalimumab-aqvh and adalimumab. Treatment-emergent adverse events (TEAEs) and study drug–related TEAEs were similar for each treatment, and most were mild or moderate in severity; no new safety signals were identified. Immunogenicity was similar after treatment with adalimumab-aqvh and adalimumab.
Conclusion: The study demonstrated PK bioequivalence between adalimumab-aqvh and adalimumab following a single dose in healthy subjects. The safety profile, including immunogenicity, of adalimumab-aqvh was also similar to that of adalimumab.

S919

Factors Associated With Cannabis Use Among Inpatients With Inflammatory Bowel Disease Exacerbation

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Introduction: Opioid use for inflammatory bowel disease (IBD) has been associated with an increased risk of disease complications. Many view cannabis as a safer palliative alternative to opioids for IBD. Cannabis use is common in the IBD population and increasingly legally available both for medical and recreational use. Cannabis does not improve inflammation but may mask IBD symptoms, with an unclear impact on disease outcomes. We sought to investigate cofactors associated with cannabis use as a first step before analysis of its impact on patient clinical outcomes.
Methods: We conducted a retrospective review of all adult patients admitted for an IBD exacerbation from 01/01/2016 to 03/01/ 2020 within the Northwell Health Care system. Patients were identified by either a primary or secondary ICD10 code (K50.xx, K51.xx, K52.3), limited to those with an IBD exacerbation defined by administration of IV solumedrol and/or biologic therapy. Pregnant patients and those with IBD related surgeries were excluded. A natural language search of admission documents was performed for the terms "marijuana", "cannabis", "pot" and "CBD". Manual chart review was then performed to confirm cannabis use. IBD disease type, age, gender, race, anxiety, depression, alcohol and tobacco use, Charlson comorbidity index (CCI), inpatient opioid use and length of stay were defined. An adjusted analysis was performed of co-factors to determine any association with cannabis use.
Results: A total of 1021 patient admissions met inclusion criteria; 47.40% with Crohn's disease and 53.09% female, and 66.01% white. Pre-admission cannabis use was reported by 7.25% of patients and was mostly (63%) for recreational use. On multivariable analysis, younger age was associated with cannabis use, as was male gender, African American race, tobacco and alcohol use, and a diagnosis of anxiety and/or depression, Table. CCI was associated with cannabis use on univariable, but not on multivariable analysis.
Conclusion: Among inpatients with IBD exacerbation, factors associated with cannabis use included age, gender, African American race, tobacco and alcohol use, along with anxiety and depression. Our findings suggest that among IBD patients, cannabis use may be less associated with disease activity than with other patient characteristics. Further analysis of the impact of Cannabis use on IBD outcomes is needed.

Table 1. **Association between pre-admission characteristics and cannabis use (N=1021)**

	Cannabis use					
	Cannabis use (n=74), n (%)	No cannabis use (n=947), n (%)	Univariable OR (95% CI)	p-value	Multivariable OR (95% CI)	p-value
Patient characteristics						
Age (years)						
Mean (SD)	36.46 (15.52)	45.97 (20.41)	0.98 (0.96, 0.99)	**0.0001**	0.96 (0.94, 0.99)	**0.0009**
Gender						
Female	22 (29.73)	520 (54.91)	0.35 (0.21, 0.58)	< **0.0001**	0.28 (0.16, 0.50)	< **0.0001**
Male	52 (70.27)	427 (45.09)	(REF)		(REF)	
Race						
African American/ Black	21 (28.38)	129 (13.62)	2.51 (1.44, 4.40)	**0.0012**	2.83 (1.52, 5.27)	**0.0011**
Asian	3 (4.05)	51 (5.39)	0.91 (0.27, 3.04)	0.8757	1.12 (0.32, 3.97)	0.8622
Other/ Multiracial	9 (12.16)	134 (14.15)	1.04 (0.49, 2.19)	0.9240	1.11 (0.50, 2.47)	0.8016
White	41 (55.41)	633 (66.84)	(REF)		(REF)	
Tobacco use						
Current	17 (22.97)	83 (8.76)	3.31 (1.78, 6.15)	**0.0002**	2.95 (1.46, 5.96)	**0.0025**
Former	12 (16.22)	160 (16.90)	1.21 (0.62, 2.38)	0.5800	1.72 (0.79, 3.74)	0.1721
Never	36 (48.65)	581 (61.35)	(REF)		(REF)	

Table 1. (*continued*)

	Cannabis use					
	Cannabis use (n=74), n (%)	No cannabis use (n=947), n (%)	Univariable OR (95% CI)	p-value	Multivariable OR (95% CI)	p-value
Unknown	9 (12.16)	123 (12.99)	1.18 (0.56, 2.52)	0.6664	1.27 (0.50, 3.21)	0.6114
Alcohol use						
Current	17 (22.97)	162 (17.11)	1.32 (0.71, 2.47)	0.3794	1.03 (0.52, 2.05)	0.9246
Former	6 (8.11)	18 (1.90)	4.2 (1.55, 11.37)	**0.0047**	3.75 (1.21, 11.59)	**0.0218**
Never	30 (40.54)	378 (39.92)	(REF)		(REF)	
Unknown	21 (28.38)	389 (41.08)	0.68 (0.38, 1.21)	0.1893	0.51 (0.25, 1.04)	0.0647
Clinical characteristics						
Anxiety						
Yes	14 (18.92)	91 (9.61)	2.20 (1.18, 4.08)	**0.0130**	2.76 (1.31, 5.81)	**0.0074**
No	60 (81.08)	856 (90.39)	(REF)		(REF)	
Depression						
Yes	12 (16.22)	53 (5.60)	3.27 (1.66, 6.43)	**0.0006**	4.07 (1.80, 9.20)	**0.0007**
No	62 (83.78)	894 (94.40)	(REF)		(REF)	
IBD type						
Crohn's disease	42 (56.76)	442 (46.67)	0.67 (0.41, 1.08)	0.0961	–	–
Ulcerative colitis	32 (43.24)	505 (53.33)	(REF)		–	–
CCI						
Mean (SD)	1.35 (2.35)	2.23 (2.90)	0.87 (0.78, 0.97)	**0.0124**	0.97 (0.83, 1.13)	0.7044

S920

Seasonal Trends in Inflammatory Bowel Disease Mortality and Disruption by the COVID-19 Pandemic

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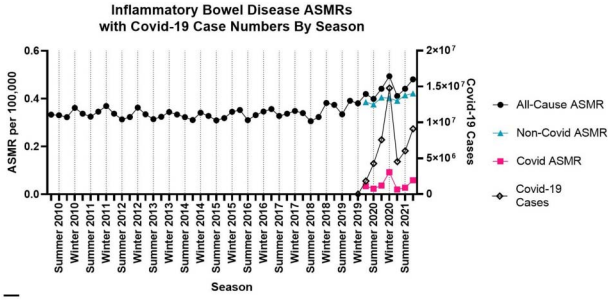
Introduction: Studies have examined the seasonality of inflammatory bowel disease (IBD) disease onset and activity. Patterns suggest greater likelihood of disease remission in the summer and disease exacerbation in the winter. It is unknown whether IBD mortality trends follow a similar pattern. In this study, we investigated seasonal variations in IBD mortality and the impact of the pandemic on these trends.
Methods: Using the National Vital Statistics System data set through the CDC WONDER website, data on IBD-related deaths among U.S. adults aged 25 years and older was obtained. IBD was defined as Crohn's disease or ulcerative colitis based on ICD-10 codes. Age-standardized mortality rates (ASMRs) per 100,000 persons were calculated for all-cause, non-COVID-related, and COVID-related mortality in this population. Number of monthly COVID-19 cases in the general population were also obtained from the CDC website. Seasons were defined as winter (December to February), spring (March to May), summer (June to August), and fall (September to November). Winter's year was defined using the year of December (i.e. Winter 2010 = December 2010 to February 2011). Mann-Whitney tests were performed to compare the median all-cause ASMRs of summer and winter pre-pandemic (prior to Winter 2019) and during the pandemic (Winter 2019 and beyond).
Results: From January 2010 to December 2021, there were 34,648 IBD-related deaths, 3,242 (9.35%) of which occurred during the pandemic. Pre-pandemic, IBD mortality demonstrated peaks in winter and nadirs in summer (Figure). In fact, as seen in Table, median all-cause ASMR was significantly higher in winter compared to summer pre-pandemic (0.3484 vs 0.3144, $p < 0.0001$). In Winter 2020, there was still a peak in IBD-related mortality, but this was largely driven by COVID-19-related death (Figure). However, over the duration of the pandemic, the median all-cause mortality of winter versus summer ceased to be significantly different (0.4371 vs 0.4202, $p > 0.999$) (Table).
Conclusion: Using a nationwide dataset, we identified seasonal variation in IBD mortality rates, with peaks in winters and nadirs in summers. However, this trend was less apparent during the COVID-19 pandemic. Further investigation into why there is seasonal variation in IBD mortality is warranted, including why seasonal trends were disrupted during the pandemic.



[0920] **Figure 1.** All-Cause, Non-COVID-Related and COVID-Related Age-Standardized Mortality Rates Among IBD Decedents from 2010 to 2021 with Overall COVID-19 Case Numbers. Trends in ASMR per 100,000 persons are shown among all IBD decedents. COVID-19 case numbers are shown among all individuals in the U.S. ASMR=Age-Standardized Mortality Rate. COVID=coronavirus disease. IBD=inflammatory bowel disease. Summer=June-August. Winter=December-February.

Table 1. Difference in Median All-Cause ASMR in Summer and Winter Pre-Pandemic and During Pandemic

Median All-Cause ASMR per 100,000 Persons			
	Summer	Winter	P-Value
Pre-Pandemic	0.3144, n=9	0.3484, n=9	< 0.0001
During Pandemic	0.4202, n=2	0.4371, n=2	> 0.9999

P-Values obtained by Mann-Whitney test. ASMR per 100,000 persons are shown among all IBD decedents. Summer=June-August. Winter=December-February. Pre-Pandemic=Summer 2010-Winter 2019. During Pandemic=Winter 2019-Summer 2021.

S921

Improving Depression Screening in Patients with IBD – A Quality Improvement Initiative

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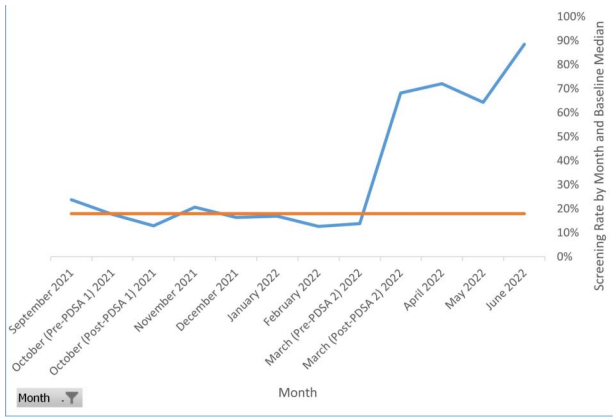
Introduction: Disparities in adherence to health maintenance recommendations have been well-documented in patients with IBD. Approaches to identify and address major depression in this population remain under-described.
Methods: From August 2021 to June 2022, the team carried out a QI project leveraging the Institute for Healthcare Improvement's Model for Improvement centering on mental health screening rates. The project team set a QI aim to increase the percentage of patients with a current PHQ-2 score (within the last 6 months) from 18% to 65% by June 30, 2022. Adherence to depression screening was quantified based on proportion of completed PHQ-2 questionnaires in all adult patients attending IBD clinic. Based on gap analysis findings, the project team implemented two interventions. The first (PDSA 1) was a multidisciplinary Tune-Up Clinic to address multiple health maintenance recommendations at one time in October and December 2021. The team implemented a Medical Assistant-driven standardized mental health screening process utilizing the PHQ-2 screening via the electronic health record in March 2022 (PDSA 2) and trained the team on its use. To support these patients who screened at 3 or above on the PHQ-2, the team worked to improve referral rates to the embedded GI psychologist through provider education and opportunity reminders. Additionally, the team set up monthly support groups in both English and Spanish to better care holistically for patients.
Results: PDSA 1 did not improve PHQ-2 screening rates. PDSA 2 improved screening rates from 18% at baseline in August 2021 to 88% after three months of implementation (image 1). Since beginning, 62% of eligible patients were already followed by another mental health professional or received a referral to and made an appointment with the GI psychologist.
Conclusion: Depression screening was identified as a gap in health maintenance in patients with IBD in an under-served population. The introduction of PHQ-2 administration to all patients in clinic led to a significant improvement in screening completion, and referrals to GI Psychologist. This model can be readily applied in IBD practice.



[0921] **Figure 1.** PHQ-2 Screening Rate by Month for Patients at IBD Clinic and Baseline Median

Table 1. Number of eligible patients and those receiving referrals to embedded GI psychologist

Month	Number of Patients with a Current PHQ-2 Score of 3 or Above	Number of Patients with Score of 3 or Above Receiving Referral to GI Psychologist
September 2021	1	1
October (Pre-PDSA 1) 2021	0	n/a
October (Post-PDSA 1) 2021	1	1
November 2021	0	n/a
December 2021	3	3
January 2022	0	n/a
February 2022	2	1
March (Pre-PDSA 2) 2022	1	0
March (Post-PDSA 2) 2022	9	4
April 2022	2	2
May 2022	2	1
June 2022	1	0

S922

Multicenter Validation of Screening Tool for Diagnosing Non-Alcoholic Fatty Liver Disease in Patients with Crohn's Disease

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Introduction: Crohn's Disease (CD) patients are twice as likely compared to controls to develop nonalcoholic fatty liver disease (NAFLD) leading to increased risk of cardiometabolic complications. Given this, we developed the first clinical screening tool for NAFLD in CD, Clinical Predictor for NAFLD in CD (CPN-CD) which uses readily accessible laboratory and clinical parameters. We have demonstrated CPN-CD outperforms the Hepatic Steatosis Index in detecting NAFLD in CD in an internal cohort. Here we performed a multicenter analysis to externally validate CPN-CD against transient elastography (TE) and establish its diagnostic accuracy to detect NAFLD in patients with CD at two different controlled attenuation parameter (CAP) thresholds.
Methods: A total of 454 patients with CD across four prospective cohorts from tertiary IBD centers across United States, Canada and India were included in the study. Of these, 412 patients were screened with TE only to determine prevalence of hepatic steatosis while 42 were screened with additional gold standard magnetic resonance imaging derived proton density fat fraction (MRI-PDFF), where hepatic steatosis was defined as ≥ 5.5% fat density, then reflexed to TE. To evaluate discriminative ability of CPN-CD to screen for NAFLD, patients were split into two CAP categories on TE; CAP ≥ 248 dB/m or ≥ 300 dB/m.
Results: In the four cohorts, the prevalence of NAFLD ranged from 32% to 76%. Using logistic regression, the relationship of CPN-CD to CAP ≥ 248 dB/m and CAP ≥ 300 dB/m revealed C-statistic 0.80 (0.75 – 0.84) and 0.79 (0.73 – 0.85) respectively. However, at CAP ≥ 300 dB/m, CPN-CD had higher specificity (74%) and NPV (80%) compared to CAP ≥ 248 dB/m (Table). For the group who first underwent screening MRI-PDFF the yield of finding NAFLD was 2- to 6-fold higher compared to TE alone.
Conclusion: CPN-CD provides fair discrimination to detect NAFLD determined on TE at CAP ≥ 300 dB/m in an external validation study conducted in four multinational cohorts. Future directions include synchronous MRI-PDFF and TE to recalibrate the score to improve specificity and then test generalizability in ulcerative colitis.

Table 1. Diagnostic accuracy of CPN-CD in detecting NAFLD in CD patients using transient elastography as reference standard

	CAP ≥ 248 dB/m	CAP ≥ 300 dB/m
Sensitivity	36%	29%
Specificity	17%	74%
PPV	21%	22%
NPV	30%	80%

CAP, controlled attenuation parameter; CD, Crohn's disease; CPN-CD, clinical predictor tool for NAFLD in Crohn's disease; NPV, negative predictive value; PPV, positive predictive value.

S923

Anti-TNFs Are Associated With Lower Prevalence of Cerebrovascular Disease in Patients With Inflammatory Bowel Disease

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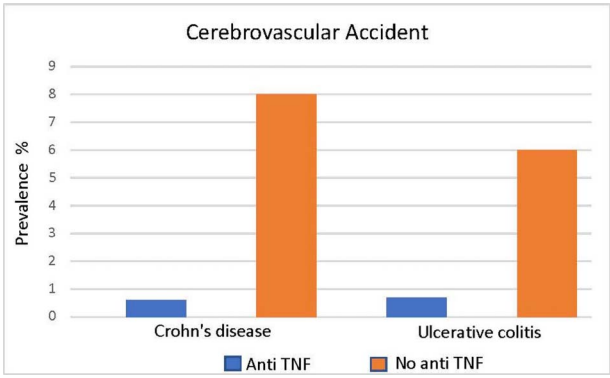
Introduction: Inflammatory bowel disease (IBD) patients are at increased risk of cerebrovascular accident (CVA) due to persistent systemic inflammation and hypercoagulability. In rheumatoid arthritis, the anti-inflammatory effects of anti-tumor necrosis factor (anti-TNF) medications are reported to improve atherosclerotic disease burden. Our study describes the effect of anti-TNF therapy on the prevalence of CVA in IBD patients.
Methods: We used a multi-institutional database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) with a concomitant diagnosis of IBD (either Crohn's disease or Ulcerative colitis) and CVA between 1999 to present. The study population was divided into two groups based on the use or lack of use of anti-TNFs. The intervention group was further categorized into infliximab- and adalimumab- users. A univariate binary logistic model was constructed using anti-TNF as the dependent variable. (Figure)
Results: Of the 70, 301,380 individuals in the database, we identified 249,300 (0.35%) patients with CD and 208,880 (0.30%) patients with UC, of whom 40,840 (16.4%) and 20,200 (10%) patients received anti-TNFs, respectively. The prevalence of CVA was 7% and 6% for CD and UC, respectively, compared to 0.3% in individuals without IBD ($p < 0.0001$). The prevalence of CVA was significantly lower in anti-TNF treated CD patients (0.6%) compared to those who did not receive anti-TNF (8%). Similarly, anti-TNF-treated UC patients were significantly less likely to have CVA (0.7%) compared to UC patients who did not receive anti-TNF therapy (6%) ($p < 0.0001$). (Table)
Conclusion: In our large cohort of IBD patients, anti-TNF medications appear to be associated with a decreased prevalence of CVA. Further prospective studies are needed to determine the pathophysiology of ant-TNF medications in improving atherosclerotic disease burden in IBD patients.



[0923] **Figure 1.** The prevalence of Cerebrovascular Accident in patients with Inflammatory Bowel Disease with and without anti-TNF therapy. CVA; cerebrovascular accident. Anti-TNF; Anti-tumor necrosis factor.

Table 1. Anti-TNF characteristics of inflammatory bowel disease individuals with Cerebrovascular Accident

Anti-TNF therapy	CVA	
	Crohn's Disease, 240 (%)	Ulcerative colitis, 140 (%)
Infliximab	100 (42%)	70 (50%)
Adalimumab	80 (33%)	40 (29%)

CVA; Cerebrovascular accident. Anti-TNF; Anti-tumor necrosis factor.

S924

Cardiovascular Outcome and Cancer Risk in Adult Patients With Ulcerative Colitis in Routine Clinical Care: The Effect of Cardiovascular Risk-Enrichment Factors

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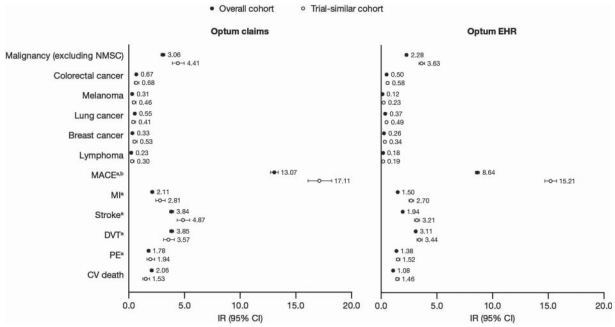
Introduction: The ORAL Surveillance study reported an increased risk of major adverse cardiovascular (CV) events (MACE) and malignancies (excluding non-melanoma skin cancer [NMSC]) with tofacitinib vs tumor necrosis factor inhibitors in patients (pts) with RA aged ≥ 50 years with ≥ 1 additional CV risk factor.[1] MACE and malignancies (excluding NMSC) were infrequent in the tofacitinib UC clinical program; however, a lack of data on background malignancy and CV risks in pts with UC with / without CV risk factors makes it difficult to contextualize these findings. We examined the risk of malignancy and CV outcomes in adult pts with UC observed in routine clinical care and the impact of CV risk-enrichment using similar inclusion criteria to ORAL Surveillance.
Methods: Retrospective data from US Optum Clinformatics® Data Mart administrative claims and electronic health records databases were used to construct an overall cohort of adult pts with a UC diagnosis between March 1 2014 and December 31 2019 (matching ORAL Surveillance time period), and a sub-cohort of pts aged ≥ 50 years with ≥ 1 additional CV risk factor, similar to the ORAL Surveillance population (trial-similar cohort). Crude incidence rates (IRs; pts with events per 100 pt-years [95% CI]) were estimated for composite and select malignancy and CV outcomes (defined in Table / Figure footnotes), respectively. IRs for CV outcomes included pts who may have had CV event history.
Results: In total, 60,059 and 11,842 pts were included in the overall and trial-similar cohorts, respectively. The proportions of pts aged ≥ 50 years, taking antihypertensive or lipid-modifying drugs, with type 2 diabetes, a body mass index ≥ 30 kg / m^2, or a history of MACE or coronary artery disease were higher in the trial-similar vs overall cohort (Table). Across databases, IRs for malignancies (excluding NMSC), MACE, myocardial infarction, and stroke were higher (non-overlapping CI) in the trial-similar vs overall cohort (Figure).
Conclusion: In CV risk-enriched pts with UC who met similar eligibility criteria to ORAL Surveillance, risks for malignancies and CV outcomes were generally higher vs the overall UC population observed in routine clinical care. Considering the differing potential risks of MACE/malignancies in the trial-like cohort vs routine clinical care, the risk of these events in pts with UC in clinical practice should be assessed individually.



[0924] **Figure 1.** Crude IRs (patients with events per 100 PY [95% CI]) for select malignancies (excluding NMSC) and select CV outcomes in the overall and trial-similar cohorts. [a] IRs for CV outcomes included patients with prior history of CV events. [b] MACE was defined as: 1) acute MI, unstable angina, ischemic stroke, hemorrhagic stroke, coronary revascularization by PCI or CABG, hospitalization due to heart failure or 2) death within 30 days of CV events: acute MI, heart failure, stroke, CABG, coronary revascularization procedures (any catheter-based or open surgical procedure to improve myocardial blood flow), CV procedures (including PTCA/PCI), cardiac transplant, sudden cardiac event, stroke, CV hemorrhage, or other CV causes (i.e., peripheral artery disease), during the period of index to end-of-study or censoring. For calculation of HRs, patients with prior CV events were excluded; Follow-up was index date to earliest date of death, loss of follow-up, end of study period, end of 5 years of follow-up, or first occurrence of event. CABG, coronary artery bypass grafting; CI, confidence interval; CV, cardiovascular; DVT, deep vein thrombosis; EHR, electronic health records; IR, incidence rate (patients with events per 100 PY); MACE, major adverse cardiovascular events; MI, myocardial infarction; NMSC, non-melanoma skin cancer; PCI, percutaneous coronary intervention; PE, pulmonary embolism; PTCA, percutaneous transluminal coronary angioplasty; PY, patient-years; UC, ulcerative colitis

Table 1. Patient demographics and baseline characteristics in the overall and trial-similar cohorts

	Overall cohort (N=60,059)		Trial-similar cohort[a] (N=11,842)	
	Optum claims (N1=20,669)	Optum EHR (N1=39,390)	Optum claims (N1=2,886)	Optum EHR (N1=8,956)
Age at index date[b]				
Age (years), mean (SD)	57 (18)	52 (18)	68 (10)	65 (10)
Age (years), n (%)				
18–30	2,058 (10)	5,729 (15)	-	-
31–40	2,457 (12)	6,006 (15)	-	-
41–49	2,629 (13)	5,639 (14)	-	-
50–60	3,919 (19)	8,509 (22)	807 (28)	3,388 (38)
61–70	4,005 (19)	6,675 (17)	924 (32)	2,798 (31)
71–80	3,725 (18)	4,587 (12)	840 (29)	1,860 (21)
>80	1,876 (9)	2,245 (6)	315 (11)	910 (10)
Female sex, n (%)	11,535 (56)	21,868 (56)	1,583 (55)	4,863 (54)
Race, n (%)				

Table 1. (*continued*)

	Overall cohort (N=60,059)		Trial-similar cohort[a] (N=11,842)	
	Optum claims (N1=20,669)	Optum EHR (N1=39,390)	Optum claims (N1=2,886)	Optum EHR (N1=8,956)
White	16,407 (79)	34,625 (88)	2,326 (81)	8,132 (91)
Black	1,864 (9)	2,907 (7)	260 (9)	552 (6)
Asian	573 (3)	381 (1)	58 (2)	45 (1)
Other/Unknown	1,825 (9)	1,477 (4)	242 (8)	227 (3)
Current smoking, n (%)[c]	2,467 (12)	9,844 (25)	306 (11)	3,021 (34)
Disease duration at index date (years), mean (SD)	2 (3)	1 (2)	1 (3)	1 (2)
Charlson index score, mean (SD)	1 (2)	1 (2)	1 (1)	1 (2)
Co-medications				
NSAIDs	4,200 (20)	9,354 (24)	657 (23)	2,121 (24)
Antihypertensive agents	9,338 (45)	13,090 (33)	1,899 (66)	4,849 (54)
Lipid-modifying agents	6,806 (33)	7,320 (19)	1,534 (53)	3,168 (35)
Antiplatelet agents	10,990 (53)	20,267 (51)	1,481 (51)	5,323 (59)
Comorbidities				
Type 2 diabetes	3,620 (18)	4,409 (11)	756 (26)	1,893 (21)
BMI ≥30 kg/m^2	3,190 (15)	13,473 (34)	462 (16)	4,217 (47)
History of MACE[d]	5,386 (26)	6,327 (16)	851 (29)	2,408 (27)
History of CAD[e]	5,404 (26)	6,411 (16)	961 (33)	2,733 (31)

Inclusion in the UC cohorts required diagnosis codes for UC in ≥ 1 inpatient or ≥ 2 outpatient records on 2 unique dates separated by ≥ 30 to < 365 days and treatment at least once within the baseline period and up to 3 months post-index date with an anti-UC agent (infliximab, adalimumab, golimumab, vedolizumab, ustekinumab, systemic corticosteroids, 5-aminosalicylic acid, azathiopurine/6-mercaptopurine, or tofacitinib)
[a]Trial-similar cohort comprised pts aged ≥ 50 years with ≥ 1 additional CV risk factor (current smoker, hypertension, diabetes mellitus, high-density lipoprotein cholesterol < 40 mg/dL, history of CAD, family history of premature coronary heart disease, RA-associated extra-articular disease)
[b]Defined as the first date that a diagnosis was found in the database records during the study calendar period and when the following criteria were met: ≥ 1 inpatient diagnosis or ≥ 2 outpatient diagnosis codes with dates separated by ≥ 30 to < 365 calendar days
[c]Defined within 365 days prior to the index date; in the Optum EHR database, current smoking was defined as current smoker, as self-reported current smoker, or any diagnosis codes for conditions related to tobacco consumption; in the Optum claims database, current smoking was defined as any diagnosis codes for conditions related to tobacco consumption
[d]MACE was defined as: 1) acute MI, unstable angina, ischemic stroke, hemorrhagic stroke, coronary revascularization by PCI or CABG, hospitalization due to heart failure, or 2) death within 30 days of CV events: acute MI, heart failure, stroke, CABG, coronary revascularization procedures (any catheter-based or open surgical procedure to improve myocardial blood flow), CV procedures (including PTCA/PCI), cardiac transplant, sudden cardiac event, stroke, CV hemorrhage, or other CV causes (i.e., peripheral artery disease), during the period of index to end-of-study or censoring
[e]Any time prior to the index date
BMI, body mass index; CABG, coronary artery bypass grafting; CAD, coronary artery disease; CV, cardiovascular; EHR, electronic health records; MACE, major adverse cardiovascular events; MI, myocardial infarction; n, number of patients meeting baseline criteria; N, number of patients in each cohort; n, number of patients meeting baseline criteria; N1, number of patients from each database included in a cohort; NSAIDs, nonsteroidal anti-inflammatory drugs; PCI, percutaneous coronary intervention; PTCA, percutaneous transluminal coronary angioplasty; RA, rheumatoid arthritis; SD, standard deviation; UC, ulcerative colitis [e]Any time prior to the index date
BMI, body mass index; CABG, coronary artery bypass grafting; CAD, coronary artery disease; CV, cardiovascular; EHR, electronic health records; MACE, major adverse cardiovascular events; MI, myocardial infarction; n, number of patients meeting baseline criteria; N, number of patients in each cohort; n, number of patients meeting baseline criteria; N1, number of patients from each database included in a cohort; NSAIDs, nonsteroidal anti-inflammatory drugs; PCI, percutaneous coronary intervention; PTCA, percutaneous transluminal coronary angioplasty; RA, rheumatoid arthritis; SD, standard deviation; UC, ulcerative colitis

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S925

Implementation of Standardized Endoscopic Scoring Systems in Patients With Inflammatory Bowel Disease

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Introduction: Endoscopic scoring systems are an established mechanism for standardized assessment of disease activity in inflammatory bowel disease (IBD) with disease-specific systems for Crohn's disease (CD) and ulcerative colitis (UC). Despite expert opinion regarding their use in endoscopy, implementation at our institution is suboptimal.
Methods: A query was opened using our institution's endoscopy software, Provation. Inclusion criteria were patients with documented IBD undergoing colonoscopy. This data was then analyzed for inclusion of either the SES-CD for CD or Mayo Score for UC in the final endoscopy report. Our intervention included departmental education regarding the implementation of standardized IBD endoscopy templates. Pre- and post-intervention data were collected.
Results: From August 2020 to February 2022, 90 CD endoscopies were performed. Of these, 61 were pre-intervention and 29 post-intervention. Prior to the intervention, 14.8% (9/61) of the colonoscopy reports included the SES-CD score, and following the intervention, 44.8% (13/29) ($p = 0.002$). Of the 160 UC endoscopies, 121 were pre-intervention and 39 following the intervention. Prior to the intervention, 46.3% (56/121) of the colonoscopy reports included the Mayo score, and following the intervention, 84.6% (33/39) ($p = 0.00003$).
Conclusion: Implementing a standardized endoscopic scoring system for patients with IBD may help alleviate some of the subjective reporting variance seen between differing endoscopists. We plan to identify providers who may not meet our proposed benchmarks individually and provide further education on the rationale behind adopting this intervention institutionally. We are also considering the implementation of standardized colonoscopy templates for incoming first-year Gastroenterology fellows to use throughout their training to make standardized reporting more routine. We believe that our practical approach to implementing standardized methods of reporting current disease states in inflammatory bowel disease patients undergoing colonoscopy is readily reproducible at other large academic and private medical centers nationwide and will improve the overall consistency and quality of endoscopy reporting for this cohort of patients. This method will lead to more patients eligible for future clinical trials and improve the overall consistency of reporting disease activity in IBD patients, thus fostering a more reliable and consistent handoff between endoscopists and the primary gastroenterologist/team.

S926

Epidemiology of Interstitial Lung Disease in Patients With Inflammatory Bowel Disease – A Large Population-Based Study

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Introduction: Interstitial lung disease (ILD) is a diverse spectrum of diseases resulting in scarring of lung parenchyma. Though considered rare, it is increasingly recognized in patients with inflammatory bowel disease (IBD). The pathogenesis is unclear but the changes in the lung are thought to represent the same type of inflammatory changes that occur in the bowel. The available literature on the association between IBD and ILD is largely based on case series. In this study, we sought to describe the epidemiology of ILD in patients with IBD.
Methods: We queried a commercial database (Explorys Inc, Cleveland, OH), an aggregate of EHR data from 27 integrated healthcare systems in the United States between 3/2017-3/2022. We identified all patients in the database with CD or UC based on Systematized Nomenclature of Medicine-Clinical Terms (SNOMED-CT). We compared the prevalence of ILD at least 30 days post-CD or post-UC diagnosis to a control cohort of patients without CD or UC.
Results: Of the 31,699,800 patients in the database, 145,290 patients had CD and 123,800 patients had UC. Overall prevalence of ILD was higher in CD (1.89%) and UC (1.91%) compared to non-IBD patients (0.8%), with odds ratio (OR) for CD 2.38 [95% CI, 2.29-2.47, p< 0.001], and UC 2.41 [95% CI, 2.31-2.51, p< 0.001]. Odds of ILD in IBD patients tended to be higher in the cohort aged 18-65 versus age > 65, in African Americans compared to Caucasians, and was otherwise similar across gender. Among autoimmune conditions associated with ILD, IBD patients with RA and SLE had a significantly lower prevalence of ILD compared to non-IBD patients with RA or SLE. IBD patients on treatment with sulfasalazine, azathioprine, infliximab, or adalimumab tended to have lower odds of developing ILD compared to non-IBD patients on the same medications. (Table)
Conclusion: In this large population-based study, we found a significantly higher prevalence of ILD in patients with CD and UC compared to patients without IBD. Interestingly, IBD patients on treatment with any of the various anti-inflammatory agents, most of which are independently associated with ILD, had lower odds of developing ILD compared to non-IBD patients on the same drugs. This data suggests that anti-inflammatory medications and IBD may be independent risk factors for development of ILD. Thus, the mechanism of lung injury in IBD patients may be unique, in which case treatment with anti-inflammatory medications may serve as a protective factor.

Table 1. Prevalence of ILD after at least 30 days post-IBD diagnosis - Above is for Crohn's Disease (CD) and below is for Ulcerative Colitis (UC)

X	CD	Prevalence per 100,000	No CD	Prevalence per 100,000	Odds Ratio	95% CI	P-Value
TOTAL	2750	1892	253640	804	2.38	2.29-2.47	<0.001
Adult (18-65)	1250	1225	92020	497	2.48	2.35-2.63	<0.001
Senior (65+)	1480	3583	142000	1873	1.95	1.85-2.05	<0.001
Female	1610	1827	129250	746	2.48	2.36-2.6	<0.001
Male	1140	2014	124580	888	2.29	2.16-2.43	<0.001
Caucasian	2290	2098	181110	1085	1.95	1.88-2.04	<0.001
African American	310	2391	37420	1040	2.33	2.08-2.61	<0.001
Asian	30	1685	3430	690	2.47	1.72-3.55	<0.001
Amyloidosis	20	8696	1110	6442	1.38	0.87-2.2	0.17
Systemic Sclerosis	50	16290	3850	18527	0.85	0.62-1.15	0.281
Polymyositis	30	12000	2360	13003	0.91	0.62-1.34	0.64
Rheumatoid Arthritis	510	2802	18350	4779	0.57	0.53-0.63	<0.001
Systemic Lupus Erythematosus	260	2014	6360	5332	0.37	0.32-0.41	<0.001
x	x	x	x	x	x	x	x
X	**UC**	**Prevalence per 100,000**	**No UC**	**Prevalence per 100,000**	**Odds Ratio**	**95% CI**	**P-Value**
TOTAL	2370	1914	254000	804	2.41	2.31-2.51	<0.001
Adult (18-65)	910	1155	92360	498	2.32	2.18-2.48	<0.001
Senior (65+)	1450	3260	142010	1874	1.78	1.69-1.87	<0.001
Female	1290	1740	129570	746	2.35	2.23-2.48	<0.001
Male	1080	2191	124610	888	2.5	2.35-2.66	<0.001
Caucasian	2020	2120	181370	1086	1.97	1.89-2.06	<0.001
African American	240	2556	37500	1041	2.49	2.19-2.83	<0.001
Asian	20	1163	3440	692	1.69	1.09-2.63	<0.02
Amyloidosis	20	10526	1100	6369	1.73	1.08-2.76	0.022
Systemic Sclerosis	30	11539	3870	18590	0.57	0.39-0.84	0.004
Polymyositis	30	13636	2360	12981	1.06	0.72-1.56	0.774
Rheumatoid Arthritis	320	2362	18520	4765	0.48	0.43-0.54	<0.001
Systemic Lupus Erythematosus	110	1175	6490	5283	0.21	0.18-0.26	<0.001

S927

The Impact of the COVID-19 Pandemic on Patients With Ulcerative Colitis: Results From a Global Ulcerative Colitis Patient Survey

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Introduction: The COVID-19 pandemic presented challenges around disease management, lifestyle changes, and provision of care for patients (pts) with ulcerative colitis (UC).
Methods: This UC Narrative global survey (United States, Canada, Japan, France, and Finland) was conducted by The Harris Poll between 25 August and 13 December 2021, among 584 pts with UC (confirmed by endoscopy) aged ≥ 18 years who had attended a gastroenterologist or internist's office in the past 3 years, had not had a colectomy, and had ever taken prescription medication for UC. The survey aimed to understand how the COVID-19 pandemic impacted pts with UC and assessed overall disease management, telehealth use, healthcare experience, perceived quality of care, emotional well-being, reliance on alternative support systems, and preferences for virtual/in-person interactions with doctors. Data were from pts who consented and completed the survey; analyzed using descriptive statistics.
Results: Overall, 25% of pts experienced more UC flares during the pandemic than in 2019. Most pts taking prescription medication (88%) were very/somewhat satisfied with their current treatment plan but overall, 53% strongly/somewhat agreed that they were hesitant to change their treatment plan during the pandemic. Factors that pts agreed helped to control UC symptoms included having fewer social outings (37%), working from home (29%), and having less busy schedules (28%). Factors that pts agreed made controlling UC symptoms more difficult included having more anxiety/stress (43%), hesitancy to visit a hospital or office (34%), and being unable to get an appointment with their doctor (23%). Virtual appointments were more common during the pandemic than before, and more pts relied on alternative support systems for management of UC (Table). Overall, 79% were very/somewhat satisfied with their ability to access needed healthcare during the pandemic, and pts who used each appointment type were equally very satisfied/satisfied with the overall quality of care at in-person (81%) and virtual (81%) appointments. However, in-person appointments were preferred by 68% of pts when meeting a new doctor, 55% when experiencing a flare, 52% for regular check-ups, and 21% for UC prescription refills.
Conclusion: During the pandemic, most pts with UC were satisfied with their current treatment plan and ability to access healthcare, and more pts relied on alternative support for management of UC, but many were negatively impacted by anxiety/stress.

Table 1. Disease management before, during, and after the COVID-19 pandemic: reliance on alternative support systems for management of ulcerative colitis

	Prior to the pandemic	During the pandemic	Plan to do after the pandemic	Have never done or plan to do
Talked openly with their doctor about how their disease impacts their life	54%	54%	44%	17%
Set goals with their doctor for managing their disease	48%	46%	40%	25%
Communicated with a nurse at their doctor's office between appointments	45%	40%	34%	32%
Used an online patient portal to contact their doctor's office or see lab results	31%	47%	33%	32%
Used social media to connect with other patients or learn about ulcerative colitis	24%	39%	27%	46%
Used symptom tracking or disease management apps	23%	31%	29%	48%
Relied on information from patient advocacy groups	19%	27%	22%	54%
Relied on patient support groups	15%	22%	22%	59%
Had virtual appointments with their doctor	13%	55%	32%	31%

S928

Effect of Etrasimod on Circulating Lymphocytes in Patients With Moderately to Severely Active Ulcerative Colitis: Data From the Phase 3 ELEVATE UC 52 and ELEVATE UC 12 Trials

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Introduction: Etrasimod (ETR), is an investigational, once-daily, oral, selective sphingosine 1-phosphate receptor 1,4,5 modulator in development for the treatment of moderately to severely active ulcerative colitis (UC). Previous reports in healthy volunteers demonstrated selective effects of ETR on adaptive immune cell subsets with little effect on innate cells; however, the impact is unknown in patients with UC. Here, we report the effect of ETR on circulating immune cells in adults with moderately to severely active UC from the Phase 3 ELEVATE UC 52 and ELEVATE UC 12 trials.
Methods: In ELEVATE UC 52 (NCT03945188) and ELEVATE UC 12 (NCT03996369), adults (16-80 years) with moderately to severely active UC and documented history of inadequate response, loss of response, or intolerance to ≥1 treatment for UC were randomized 2:1 to once-daily treatment with ETR 2 mg or placebo (PBO). In this exploratory analysis, whole blood was collected throughout the studies for characterization of immune cell subsets by flow cytometry. Mean (SE) percent change from baseline (in cells/μL) to Weeks 2, 4, 8, 12, 16, 20, 24, 32, 40, 48, and 52 in ELEVATE UC 52 and Weeks 2, 4, 8, and 12 in ELEVATE UC 12 were compared between ETR 2 mg and PBO using 2-sided *t* tests.
Results: Whole blood from 433 patients in ELEVATE UC 52 (ETR 2 mg, n=289; PBO, n=144) and 349 patients in ELEVATE UC 12 (ETR 2 mg, n=236; PBO, n=113) was included for immunophenotyping. Treatment with ETR 2 mg resulted in rapid mean (SE) percent reductions (in cells/μL) from baseline to Week 2, with nadir or near nadir changes from baseline reached by Week 4 in ELEVATE UC 52 and ELEVATE UC 12, respectively, for total T cells ($CD3^+$: −55.6% [1.50] and −55.9% [1.65]), T helper cells ($CD3^+CD4^+$: −71.1% [1.33] and −72.5% [1.30]), cytotoxic T cells ($CD3^+CD8^+$: −35.7% [1.94] and −33.8% [2.60]), and B cells ($CD3^-CD19^+$: −74.5% [1.05] and −75.2% [1.18]); reductions were maintained through Week 52 in ELEVATE UC 52 and Week 12 in ELEVATE UC 12. There were no notable changes in natural killer cells ($CD3^-CD56^+CD16^+$) or monocytes ($CD14^+$) during the treatment period of either study.
Conclusion: Treatment with ETR has a rapid and differential effect on the frequency of circulating immune cell subsets in peripheral blood in patients with moderately to severely active UC. These findings may help explain the 5 serious infections in PBO and 3 in ETR observed in the ELEVATE UC 52 and ELEVATE UC 12 trials and the balanced overall infection rates across treatment arms in both studies.

S929

Assessment of Virtual Reality on Pain and Anxiety at an Infusion Clinic Setting in Patients With Inflammatory Bowel Disease: A Pilot Acceptability Study

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Introduction: Inflammatory Bowel Disease (IBD) is a chronic relapsing and remitting inflammatory condition of the bowel lumen. While abdominal pain is most severe when acute inflammation is present, many patients with IBD in endoscopic remission continue to have abdominal pain. Psychological conditions like anxiety may exacerbate symptoms and cause more frequent flares, leading to increased hospitalizations. Non-pharmacological methods such as virtual reality (VR) have been shown to decrease pain and anxiety in inpatient settings. While there has been support of VR in IBD patients in an clinic setting, no studies have assessed the use of VR in IBD patients at infusion centers, an important aspect of IBD management. If VR can improve both pain and anxiety, then it may lead to improved health outcomes.
Methods: This is a prospective, single-center, paired-sample study of adult patients with IBD, where pain and anxiety were measured before and after their regular infusion clinic appointment, with the use of VR on their following infusion appointment. At the end of the study, there was an assessment of the feasibility of VR for future encounters. Anxiety was measured using the Beck Anxiety Inventory (BAI), and pain was measured using the Short-Form McGill Pain Questionnaire (SF-MPQ). The VR headset included immersive options such as guided meditations and deep sea diving, and prohibited content that would cause potential distress. Paired sample t-tests were utilized to compare any differences in pain or anxiety during their infusion therapy, with and without use of virtual reality.
Results: In this pilot study, we report data of 14 adult patients with IBD (57% Crohn's Disease, 43% Ulcerative Colitis). Mean age was 42.07 years. Demographic, BAI, SF-MPQ, and VR feasibility data are shown in Table (Table).
Conclusion: While preliminary analyses show VR had no significant change in BAI (t = -0.244, p-value = 0.405) and SF-MPQ (t = -0.336, p-value = 0.371), participants reported positive experiences with VR. Patients rated their experience an average of 7.79 on a scale of 1 to 9. 71% of patients reported they would like to use VR during future appointments. These finding support the acceptability of VR in an infusion clinic setting, and provide a framework for further assessment of pain and anxiety in future larger randomized control trials.

Table 1. VR IBD Group Data

Age	Mean 42.07 years
Sex	
• Male	8 (57%)
• Female	6 (43%)
IBD Type	
• Crohn's Disease	8 (57%)
• Ulcerative Colitis	6 (43%)
Infusion Medication	
• Infliximab	7 (50%)
• Vedolizumab	7 (50%)
Percent of Time with VR During Infusion	
• Total	Mean: 74%
• Infliximab	Mean: 50%
• Vedolizumab	Mean: 98%
Chronic Opioid Use	2 (14%)

Table 1. (*continued*)

Age	Mean 42.07 years
Pharmacologic Therapy for Anxiety	4 (29%)
Nonprescription Therapy for Anxiety/Pain	5 (36%)
Beck Anxiety Inventory (BAI)	t = -0.244, p-value = 0.405
Short Form McGill Pain Questionnaire (SF-MPQ)	t = -0.336, p-value = 0.371
Would Like to Use VR During Future Appointments	10 (71%)
Rate Your Experience 1 (Dislike) to 5 (Indifferent) to 9 (Enjoyed)	Mean: 7.79
Infusion Experience Felt Faster with VR	12 (86%)
Forgot was in Infusion Clinic with VR	3 (21%)

S930

Identifying Risk Factors and Predictors of Malnutrition in Patients With Inflammatory Bowel Disease at a Tertiary Care Center

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Introduction: Malnutrition is highly prevalent in patients with inflammatory bowel disease (IBD). Nutritional assessment tools have been created to identify malnourished individuals and facilitate prompt nutritional intervention. The Malnutrition Universal Screening Tool (MUST) is a validated tool recommended for patients across all healthcare settings. In the present study, we implemented the MUST among patients with IBD at outpatient clinics in an academic health system. The aim of this study was to examine the relationship between patient and clinical characteristics, and laboratory markers of nutrition with the MUST nutritional risk score in patients with IBD.
Methods: This was a multi-center retrospective study conducted in outpatient clinics throughout the MedStar Healthcare System. 199 patients with IBD were screened using the MUST between February 10, 2022, and May 31, 2022. Low, medium, and high nutritional risk scores were defined as a score of 0, 1, or ≥ 2, respectively. We examined the association between the MUST scores and patient demographic data, markers of nutrition, and markers of disease activity. Univariate and multivariate logistic regression was used to examine associations between independent risk factors with nutritional risk score.
Results: Among the 199 patients screened, 87% were classified as low risk for malnutrition, 9% as moderate risk, and 4% as high risk. There was no statistically significant association between nutritional risk score and sex, IBD diagnosis, or age. In univariate analysis, IBD-related hospitalizations within one year of screening ($p = 0.022$), recent steroid use ($p < .001$), and elevated C-reactive protein (CRP) ($p = 0.027$) were associated with moderate-to-high risk of malnutrition as compared to low risk (Table). Decreased albumin (OR: 0.10; 95% CI: 0.02-0.57) and decreased hemoglobin (OR: 0.58; 95% CI: 0.40-0.84) were also significant predictors of malnutrition. In multivariate analysis, recent steroid use remained an independent risk factor for malnutrition.
Conclusion: In this study, we demonstrate that MUST screening correlates to markers of disease activity, inflammation, and nutrition in patients with IBD. Univariate analysis identified IBD-related hospitalizations, recent steroid use, elevated CRP, decreased albumin, and decreased hemoglobin as risk factors. Only recent steroid use was identified as an independent risk factor. Further study on nutritional risk screening and disease markers in larger populations is warranted.

Table 1. **Univariate analysis of risk factors associated with moderate-high risk nutritional risk score**

Characteristic	Odds Ratio	95% Confidence Interval		P-Value
		Lower Limit	Upper Limit	
Steroid Use	7.314	2.346	22.805	**< .001**
IBD-related Hospitalization	4.632	1.247	17.213	**0.022**
CRP (mg/L)	1.129	1.014	1.257	**0.027**
Fecal Calprotectin (mcg/gm)	1.001	1.000	1.002	0.062
Albumin (gm/dL)	0.101	0.018	0.570	**0.009**
Hemoglobin (gm/dL)	0.580	0.403	0.835	**0.003**

S931

Micronutrient Deficiencies in Elderly Inflammatory Bowel Disease Are Not Associated With Worse Adverse Outcomes

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Introduction: Micronutrient deficiencies (MND) occur in 20-85% of inflammatory bowel disease (IBD) patients and have been associated with poor clinical outcomes. Advanced age is also a risk factor for MND. No study has examined the relationship between MND in elderly IBD patients and adverse clinical outcomes. We sought to evaluate MND rates in elderly IBD patients and determine their correlation with poor clinical outcomes.
Methods: We conducted a retrospective cohort study of a single, tertiary-care institution IBD database to collect demographic, micronutrient, and clinical outcome data. IBD adult patients with at least one year of follow-up were divided into two arms: 1) age 18-59, and 2) age ≥ 60 years old. Cutoffs for MND included: iron (ferritin < 30 ng/mL, transferrin saturation < 20%), 25-hydroxyvitamin D < 30 ng/mL, zinc < 0.66 mcg/dL, vitamin B12 < 200 pg/mL, and folate < 2.7 ng/mL. Primary outcomes included subsequent need for corticosteroids, combined intestinal complication (intra-abdominal abscess, intestinal stricture, internal fistula), IBD-related surgery or hospitalization, and a composite clinical outcome of any single outcome occurrence. Statistical analyses included Wilcoxon-Rank-Sum test, chi-squared, and Fisher's Exact test.
Results: Of 185 total studied IBD patients, 57 were elderly, and there was no difference in corticosteroid or biologic use between the groups. Mean follow-up duration was 3.2 years. At least one MND was present in 80.5% of the total population and did not differ between the two age groups. Compared to younger IBD adults with MND, older patients had less corticosteroid use (19.3% vs 35.9%, $p = 0.03$) and a better composite clinical outcome (29.8% vs. 47.7%, $p = 0.025$). Vitamin D deficiency correlated with current biologic use ($p = 0.044$) and female sex was associated with zinc deficiency ($p = 0.026$). Iron deficiency coincided with increased rates of the composite outcome (63.5% vs 33.3%, $p = 0.036$) in the young cohort. Significant cohort-specific outcomes were not observed with other MNDs (Table).
Conclusion: Vitamin and mineral deficiencies were present in a vast majority of IBD patients regardless of age. Compared to younger adults with IBD, older IBD patients with MND were less likely to have adverse clinical outcomes. Larger and longer studies are needed to verify these results.

Table 1. Summary of Clinical Outcomes by Age Group for All IBD Patients

Outcome	Young (n = 128)	Elderly (n = 57)	p-value
Need for Corticosteroids	46 (35.94%)	11 (19.30%)	0.026
Internal Fistula	2 (1.56%)	1 (1.75%)	0.78
Intra-abdominal Abscess	3 (2.34%)	0 (0.00%)	0.61
Intestinal Stricture	9 (7.03%)	2 (3.51%)	0.51
Peri-Anal Disease	14 (10.94%)	4 (7.02%)	0.59
Combined Intestinal Complication	22 (17.19%)	6 (10.53%)	0.28
IBD-Related Surgery	9 (7.03%)	4 (7.02%)	>0.99
IBD-Related Hospitalization	21 (16.41%)	11 (19.30%)	0.68
MAGE	61 (47.66%)	17 (29.82%)	0.025

Fisher's exact test was performed to compare each clinical outcome between age groups. Need for corticosteroids was defined by any oral corticosteroid prescription written for IBD symptoms during the follow-up period. Patients met the combined intestinal outcome by developing at least one internal fistula, intra-abdominal abscess or intestinal stricture during follow-up. Major adverse gastrointestinal event (MAGE) was defined as one or more of the following outcomes occurring during the follow-up period: need for corticosteroids, internal fistula, intra-abdominal abscess, intestinal stricture, peri-anal disease, IBD-related surgery, or IBD-related hospitalization.

S932

Active Tuberculosis and Opportunistic Infections: Pooled Safety Analysis of Ustekinumab Through up to 5 Years Across All Approved Indications

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Introduction: Ustekinumab (UST) is an approved treatment for adults with inflammatory bowel disease (IBD: Crohn's disease [CD] and ulcerative colitis [UC]), psoriasis (PsO), and psoriatic arthritis (PsA). Here, we present pooled safety analyses in these approved indications of patients (pts) with active tuberculosis (TB) and opportunistic infections (OIs) through 5 years (yrs) of UST treatment.
Methods: Pooled data included 13 Phase 2/3 UST studies through 5 yrs of CD and PsO, 2 yrs of UC, and 1 yr of PsA. OIs were identified by clinician review. Herpes zoster (HZ) was evaluated separately. Event rates per 100 pt yrs (PYs) are presented. Concomitant immunomodulators/corticosteroids were permitted in IBD and PsA pts. All pts who received ≥1 UST dose were included. In IBD, placebo (PBO) pts included data up to the first UST dose for pts initially treated with PBO, or >16 weeks after the last UST dose for UST pts who switched to PBO.
Results: Across all approved indications, 19 OIs including TB were reported, with rates in PBO of 0.40 and UST of 0.10 through 5 yrs in 13807 PYs of follow-up (Table); rates of HZ were 1.21 and 0.63, respectively. Of 19 OIs, 18 were in IBD pts and 1 in a PsO pt. Overall, 14/16 pts (12/13 UST) with OIs excluding TB were also receiving confounding concomitant medications. A total of 3 active TB cases (2 pts with CD and 1 pt with UC) were reported in PBO (n=2; 1 in a CD pt 10 months after receiving UST 130 mg IV) and UST pts (n=1) (Table). One active TB case was reported in an asymptomatic South African CD pt treated with UST who had a positive QuantiFERON®-TB Gold test on routine screening and bronchial brushings positive for *M. tuberculosis*. Both CD pts completed TB treatment with disease resolution. The most common OIs were esophageal candidiasis (UST n=3; PBO n=2) and cytomegalovirus colitis (UST n=3; PBO n=1).
Conclusion: Rates of OIs, including active TB, in UST-treated pts were low across approved indications through up to 5 years with 13807 PYs of follow-up and not higher in UST pts vs PBO, suggesting no increased risk of OI with long-term UST treatment.

Table 1. Opportunistic infections (OIs) and active tuberculosis (TB) in Inflammatory Bowel Disease (CD, UC) and Psoriatic studies (PsO, PsA) through up to 5 yrs; numbers of events per 100 patient-years (PYs) of follow-up

	Inflammatory Bowel Disease Indications[a]		Psoriatic Indications[a]		All Approved Indications Pooled	
	Placebo[b] (n=1389)	Ustekinumab[c] (n=2575)	Placebo[d] (n=1112)	Ustekinumab[e] (n=4135)	Placebo[b,d] (n=2501)	Ustekinumab[c,e] (n=6710)
Total PYs of follow-up	916	3960	327	9847	1244	13807
Average duration of follow-up (weeks)	34.31	79.97	15.30	123.83	25.86	107.00
All OIs, event rates per 100 PYs [n]	0.55 [5]	0.33 [13]	0.00 [0]	0.01[1]	0.40 [5]	0.10 [14]
OIs excluding TB	0.33 [3]	0.30 [12]	0.00 [0]	0.01 [1]	0.24 [3]	0.09 [13]
TB	0.22 [2]	0.03 [1]	0.00 [0]	0.00 [0]	0.16 [2]	0.01 [1]

[a]Psoriatic (PsO and PsA) trials evaluated subcutaneous ustekinumab (UST) 45/90 mg or placebo (PBO), generally at week 0 and 4, then every 12 weeks (q12w). IBD (CD and UC) trials generally evaluated a single intravenous UST dose (130 mg or weight range-based dosing of ~6 mg/kg) or PBO induction dose at week 0, followed by subcutaneous UST 90 mg at week 8, then q8w or q12w.
[b]CD and UC: includes data up to the first UST dose for patients who were initially treated with PBO; includes data at or after 16 weeks from the first UST dose onward, up to the dose adjustment if patients had a dose adjustment, for patients who crossed-over or re-randomized to PBO maintenance
[c]CD and UC: includes data up to 16 weeks from the first UST dose for patients who crossed-over or re-randomized to PBO maintenance, and from the dose adjustment onward if patients had a dose adjustment from subcutaneous PBO to subcutaneous UST 90 mg q8w
[d]Psoriatic diseases: includes data up to the time of early escape or crossover
[e]Psoriatic diseases: includes data from the first UST dose onward for patients who early escaped or crossed-over from PBO

S933

Racial Disparities in Extraintestinal Manifestations in Patients With Inflammatory Bowel Disease

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Introduction: Extraintestinal manifestations (EIM) are seen in 6% to 25% of IBD patients. While some EIMs occur as a direct result of bowel inflammation, other EIMs are due to an influx of mononuclear cells activated in the intestine but targeting extraintestinal organs. However, it is unclear if the pathogenesis and prevalence of EIM vary based on the race of IBD patients. Our study explored the prevalence of EIM of IBD among the major racial groups in the United States.
Methods: We used a commercial database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) with a diagnosis of IBD between 1999 to 2022. Based on race, the study population was divided into two groups African American and Caucasian. The two groups were further categorized based on the extraintestinal manifestations of IBD.
Results: Of the 70,383,890 individuals in the database, we identified 412,950 (0.59%) patients with IBD. Among all IBD patients, 32,870 were African American (8%) and 314,660 (76.2%) were Caucasian. When compared with Caucasians, African American IBD patients were at increased risk of pyoderma gangrenosum (OR 1.61), erythema nodosum (OR 1.39), pulmonary embolism (PE) (OR 1.06), deep vein

thrombosis (DVT) (OR 1.24), interstitial lung disease (ILD) (OR 1.14), chronic kidney disease (CKD) (OR1.43), uveitis (OR 2.65), episcleritis (OR 1.78) and autoimmune hepatitis (AIH) (OR 1.54) . However, psoriasis (OR 0.49), vasculitis (OR 0.87) , ankylosing spondylitis (OR 0.82) and osteoporosis (OR 0.63) were less common in African American IBD patients (Table).

Conclusion: Our large cohort of IBD patients demonstrates significant racial differences in the prevalence of EIM of IBD in the United States. The association between race and extraintestinal inflammation in IBD patients is unclear. Further research into racial variations in the pathophysiology of EIM in IBD patients is required.

Table 1. Comparison of The Prevalence of Extra-Intestinal Manifestations Among Caucasian and African-American IBD Patients

	AA IBD n=32,870 (%)	Caucasian IBD n=314,660 (%)	OR	CI	P-value
Pyoderma Gangrenosum	210 (0.6%)	1,250 (0.4%)	1.61	1.61-1.87	< 0.0001
Erythema nodosum	180 (0.5%)	1,240 (0.4%)	1.39	1.19-1.63	< 0.0001
AIH	140 (0.4%)	870 (0.3%)	1.54	1.29-1.84	< 0.0001
ILD	1,080 (3.3%)	9,070 (2.9%)	1.14	1.07-1.22	< 0.0001
Episcleritis	80 (0.2%)	430 (0.1%)	1.78	1.40-2.26	< 0.0001
Uveitis	740 (2.3%)	2,710 (0.9%)	2.65	2.44-2.88	< 0.0001
PE	1,650 (5%)	14,930 (4.7%)	1.06	1.01-1.11	=0.0261
DVT	1,860 (5.7%)	14,500 (4.6%)	1.24	1.18-1.31	< 0.0001
CKD	4,740 (14.4%)	33,250 (10.6%)	1.43	1.38-1.47	< 0.0001
Psoriasis	440 (1.3%)	8,540 (2.7%)	0.49	0.44-0.54	< 0.0001
Vasculitis	1,930 (5.9%)	21,130 (6.7%)	0.87	0.83-0.91	< 0.0001
Ankylosing Spondylitis	250 (0.8%)	2,910 (0.9%)	0.82	0.72-0.93	= 0.0029
Osteoporosis	2,590 (7.9%)	37,680 (12%)	0.63	0.60-0.66	< 0.0001

Univariate analysis used to calculate OR, OR; odds ratio, CI; confidence interval, AA; African-American, IBD; inflammatory bowel disease, AIH;Autoimmune hepatitis, ILD; interstitial lung disease, PE; pulmonary embolism, DVT; deep venous thrombosis, CKD; chronic kidney disease.

S934

Comparative Effectiveness of Vedolizumab Versus Ustekinumab in Anti-TNF Experienced Patients With Crohn's Disease

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Introduction: Primary and secondary non-response to anti-TNF therapy is common in patients with Crohn's disease (CD), yet there is a paucity of research comparing vedolizumab and ustekinumab as subsequent therapy. Prior studies, limited to tertiary care centers in Europe, have yielded conflicting results and did not include reported outcomes (PROs). We sought to compare the effectiveness of vedolizumab and ustekinumab in anti-TNF experienced patients with CD, focusing on patient-prioritized PROs.

Methods: We utilized the IBD Partners internet-based research infrastructure to conduct a prospective, direct-to-patient cohort study in a geographically diverse U.S. population. Within IBD Partners, participants report disease characteristics, current and prior treatments, and PROs every 6 months. For this analysis, we identified anti-TNF experienced patients with CD initiating vedolizumab or ustekinumab and analyzed PROs reported approximately 6 months later (minimum 4 months, maximum 10 months). Co-primary outcomes were Patient Reported Outcome Measurement Information System (PROMIS) domains of Fatigue and Pain Interference. Secondary outcomes included patient-reported short Crohn's Disease Activity Index (sCDAI) and treatment persistence and corticosteroid use at the time of follow-up. Inverse probability of treatment weighting (IPTW) was used to control for potential confounders and incorporated into linear and logistic regression models for linear and categorical outcomes, respectively.

Results: Overall, 141 vedolizumab and 219 ustekinumab initiators were included in our analysis. After adjustment, we found no differences in our primary outcomes of Pain Interference or Fatigue or the secondary outcome of sCDAI between initiators of vedolizumab versus ustekinumab (Table). However, vedolizumab was associated with lower treatment persistence (OR 0.36, 95% CI 0.22-0.60) and higher corticosteroid use at follow-up assessment (OR 1.69, 95% CI 1.13-2.56).

Conclusion: Vedolizumab and ustekinumab are similarly effective at 6 months, as measured by a broad panel of patient-centered outcomes; although we observed higher treatment persistence and lower corticosteroid use among ustekinumab users. Hence, factors such as patient preference, route of administration, cost, and data regarding other outcomes must be considered when making decisions about subsequent treatment options.

Average Treatment Effects (adjusted) at 6-months among Patients with Crohn's Disease Initiating Treatment with Vedolizumab versus Ustekinumab following anti-TNF Therapy

	Estimate (95% Confidence Intervals) *	P-value
Primary Outcomes		
Fatigue	0.6 (-1.9.0-3.0)	0.657
Pain Interference	-0.2 (-2.3-1.9)	0.824
Secondary Outcomes		
Index medication persistence	0.36 (0.22-0.60)	<0.001
Corticosteroid use	1.69 (1.13-2.56)	0.010
sCDAI	6.0 (-13.36-25.36)	0.688
Social satisfaction	-0.9 (-3.0-1.3)	0.435

*Estimates for Patient Reported Measurement Information System (PROMIS) measures of Fatigue, Pain Interference, and Social Satisfaction and the Short Crohn's Disease Activity Index (sCDAI) represent adjusted mean differences comparing treatment with vedolizumab versus ustekinumab. Estimates for persistence and corticosteroid use represent adjusted odds ratios for treatment for vedolizumab versus ustekinumab.

[0934] **Figure 1.** Average Treatment Effects (adjusted) at 6-months among Patients with Crohn's Disease Initiating Treatment with Vedolizumab versus Ustekinumab following anti-TNF Therapy

S935

Efficacy and Safety of Etrolizumab in Treatment of Moderate to Severe Ulcerative Colitis: A Systematic Review and Meta-Analysis of Clinical Trials

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Introduction: Recent clinical trials have assessed the efficacy and safety of Etrolizumab in treatment of ulcerative colitis.
Aim: To assess the efficacy and safety of Etrolizumab for induction and maintenance of remission in moderate to severe ulcerative colitis.
Methods: We searched the following databases: PUBMED, Web Of Science, OVID, and SCOPUS in 15 January 2022. Inclusion criteria were any phase 2 and 3 clinical trials that compare Etrolizumab with placebo in treatment of moderate to severe ulcerative colitis, excluding case reports, animal studies, phase 1 trials, and conference abstracts. We used RevMan software (5.4) for the meta-analysis.
Results: Five clinical trials were included in our meta-analysis. The total number of patients included in the study is 1249 patients, 960 patients in the Etrolizumab group, and 399 patients in the placebo group. In the induction phase, the pooled analyses showed a statistically significant association between Etrolizumab and increased clinical remission, and endoscopic remission compared with placebo (RR= 2.66, [95% CI= 1.69 to 4.19], $P < 0.0001$), and (RR= 2.35, [95% CI= 1.52 to 3.65], $P = 0.0001$). In the maintenance phase, the pooled analyses showed a statistically significant association between Etrolizumab and increased histologic remission and endoscopic remission (RR= 2.04, [95% CI= 1.40 to 2.99], $P = 0.0002$) and (RR= 1.92, [95% CI= 1.29 to 2.95], $P = 0.001$). No statistically significant difference was observed in adverse events between Etrolizumab and placebo in induction and maintenance phases.
Conclusion: Our results show that Etrolizumab is an effective and safe drug for the induction and maintenance of clinical remission in moderate to severe ulcerative colitis patients proved by histologic and endoscopic findings. Future randomized trials are still needed to compare Etrolizumab to the other agents and further establish its value for the practice.

S936

Factors Associated With Fecal Calprotectin Sample Collection Compliance: An IBD Center Quality Improvement Project

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Introduction: Regular assessment of objective markers of inflammatory bowel disease (IBD) activity is recommended. Fecal calprotectin (Fcal) is a non-invasive and inexpensive biomarker of disease activity, however, patient compliance with this test is variable and incompletely described. We assessed compliance rates with Fcal tests and identified factors associated with non-compliance.
Methods: As a quality improvement project, we conducted a retrospective chart review of IBD patients who had a Fcal test ordered by us between August 2021 and December 2021. Demographic, clinical, disease-related, and test-related (location of lab relative to the patient's visit in clinic or at home) information were recorded to determine predictors for non-compliance. Simple statistical analysis and multivariable logistic regression was performed.
Results: Of 303 patients, 165 (54.4%) had an order for Fcal. Of the Fcal tests ordered, 55 (33.3%) were not completed. Between those with complete versus incomplete tests, IBD remission status (67.8% vs. 83.7%, $p = 0.033$), history of prior Fcal order completion (93.2% vs. 68.4%, $p = 0.001$), and test ordered to an external site (62.7% vs. 85.5%, $p = 0.004$) were significantly different. A multivariable logistic regression with these factors as well as age, gender, telehealth vs. in-person consultation, and patient residence revealed that history of a prior completed Fcal test is independently associated with subsequent test completion (odds ratio (OR) = 8.3, 95% CI 1.9-35.5, $p = 0.004$). Fcal testing location (institutional or third-party) was marginally significant (OR = 0.27, 95% CI 0.7-1.0, $p = 0.051$). A multivariable linear regression for days between test order and completion found that tests ordered for external locations are associated with delayed completion (95% CI 5.2-20.6, $p = 0.002$).
Conclusion: In this single center analysis with Fcal testing in patients with IBD, we found that a history of incomplete testing is associated with subsequent non-compliance, and distant location of the lab is associated with delayed completion of the test. These findings suggest that ordering providers should identify additional methods to educate on the importance of disease monitoring with Fcal and when possible, simplify the lab used for testing. Future availability of at home Fcal tests may be helpful in this regard.

Table 1. Linear Regressions for Predictors of Fecal Calprotectin Compliance

	Logistic Regression for Test Compliance				Regression for Delayed Testing Completion			
	Estimate Effect Size (B)	Standard Error	P - Value	95% Confidence Interval	Estimate Effect Size (B)	Standard Error	P - Value	95% Confidence Interval
Age	0.017	0.015	0.248	0.998-1.048	0.148	0.104	0.163	-31.309-7.575
Gender	-0.441	0.543	0.417	0.222-1.866	0.877	3.635	0.810	0.062-0.357
IBD Remission	-0.949	0.624	0.128	0.114-1.316	-0.331	3.895	0.933	-6.421-8.176
Consultation Type	-.0523	0.528	0.322	0.210-1.570	0.102	3.992	0.980	-8.151-7.490
History of Fecal Calprotectin Completion	2.116	0.741	**0.004**	1.942-35.493	6.628	2.625	0.357	-7.699-20.956
Fecal Calprotectin Testing Location	-1.304	0.668	**0.51**	0.073-1.005	12.875	3.843	**0.002**	5.160-20.591

S937

Venous Thromboembolism in the Setting of Inflammatory Bowel Disease: A Multi-Centric Retrospective Analysis

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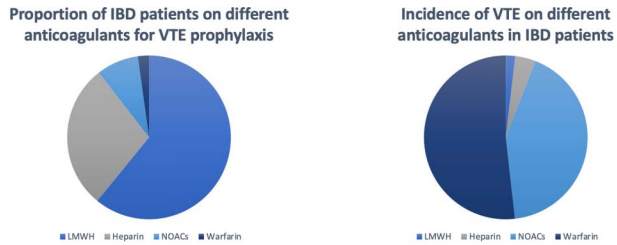
Introduction: Inflammatory bowel disease (IBD) is a systemic inflammatory condition with an increased risk of venous thromboembolism (VTE). The most common sites include deep veins of lower extremities and pulmonary vasculature, and rarely cerebrovascular veins which can significantly increase morbidity and mortality. While the higher incidence of VTE in IBD has been well established, standardized risk assessment models for VTE do not consider the presence of IBD as a high-risk factor.
Methods: A retrospective chart review of 261 randomly selected patients with IBD over the last 5 years was performed. Patients with an incidence of VTE in the last 5 years (2017-2022) were identified. Baseline characteristics, site of VTE, use of anticoagulation for VTE prophylaxis, and anticoagulant used were collected. Descriptive statistics were used to analyze the incidence of VTE and the percentage of patients on anticoagulation.
Results: The 5-year incidence of VTE in the studied 259 patients was 13.51% (35) of which 11.2% (29) had DVT, 3.5% (9) had both DVT and PE, and 2.3% (6) had only PE. The average age of the patients with VTE was 57.4 ± 12.3 years; 37% (13) were men and 63% (22) were women; 66% (23) were Caucasian, 31% (11) were African American, and 3% (1) were Pacific-islander. Of the 259 patients, 133 (51.4%) received VTE prophylaxis during hospitalizations, while 126 (48.6%) did not. Of the patients who received prophylaxis, the incidence of VTE was 4.5% (6 of 133) whereas the incidence was 23% (29 of 126) in those who did not receive VTE prophylaxis. Of the 133 patients who were on anticoagulation, 11 were on NOACs (8.3%), 38 were on heparin (28.6%), 81 were on LMWH (60.9%), and 3 were on warfarin (2.2%). Of the 6 patients who had an incidence of VTE on anticoagulation, 3 were on NOACs, 1 was on heparin, 1 was on LMWH, and 1 was on warfarin.
Conclusion: Being a chronic inflammatory state, IBD is associated with a 2-3 times higher incidence of VTE. However, multiple factors exist in both the pathophysiology and treatment of the disease that may contribute to the development of VTE. Numerous factors such as surgeries, use of steroids, and gender have been implicated in increasing the risk for VTE. There is a wide scope for further research regarding the same. Despite conclusive evidence, at most centers, the presence of IBD is not considered to be a high-risk factor for VTE warranting anticoagulation. Awareness and education are the cornerstones to cause a momentous change in practice patterns.



[0937] **Figure 1.** Proportion of IBD patients on different anticoagulants and the incidence of VTE while on them

S938

Gender-Based Differences in Sarcopenia Screening With the SARC-F Questionnaire in Inflammatory Bowel Disease

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Introduction: Sarcopenia is a modifiable condition that affects 27 to 61% of patients with inflammatory bowel disease (IBD), however, traditional measurements of sarcopenia can be cumbersome and are not rapidly available. The aim of this study was to use a five-item questionnaire, SARC-F, to assess sarcopenia in patients with IBD.
Methods: Patients (≥18 years) seen at the IBD Center with a confirmed diagnosis of IBD without short bowel syndrome were invited to complete a SARC-F questionnaire. Retrospective chart review was performed for demographic and disease characteristics for all patients that completed the questionnaire. For patients with available CT or MRI abdominal imaging within 3 months of completion of the questionnaire, the SMI was measured using a single slice through the third lumbar vertebra. Sarcopenia on SARC-F was defined as a score ≥4 and on SMI as $< 55cm^2/m^2$ for males and $< 39cm^2/m^2$ for females[1].
Results: Among 233 patients that completed the SARC-F questionnaire, 44 patients met criteria for sarcopenia with a score ≥4 on SARC-F (Table). Tobacco use (25% vs 3.7%, p=< 0.0001), history of bowel surgery (59.1% vs 32.8%, p= 0.0017) and BMI (32.6 vs 27.7, p=< 0.0001) were all associated with sarcopenia on SARC-F. Of the 233 patients included, 58 had recent abdominal imaging available for measurement of SMI. Among this cohort, sarcopenia was identified in 15 patients by SMI and in 16 patients by SARC-F with 2 patients identified to have sarcopenia on both. Men were more likely to have sarcopenia on SMI than females (50% vs 11%, p=0.0017). Conversely, more females were identified to have sarcopenia on SARC-F than males (31.2% vs 11%, p=0.1448). This remained true amongst all patients that completed the questionnaire with more females than males positive for sarcopenia on SARC-F (23.2% vs 10.3%, p=0.017).
Conclusion: More females screened positive for sarcopenia on the SARC-F questionnaire while more males screened positive for sarcopenia on SMI, the gold standard. This may indicate a gender bias that could limit accuracy of patient-driven answers to questions regarding physical strength and function. Further research to identify factors that affect sarcopenia screening is warranted.

Table 1. Characteristics of Patients that Completed the SARC-F Questionnaire

	Sarcopenia n = 44	No Sarcopenia n = 189	*p-value*
SARC-F Score (Mean, SD)	5.2 (1.3)	0.7 (1.0)	< **0.0001**
Age (Mean, SD)	47.8 (13.8)	43.1 (14.4)	0.0566
Gender (%)			**0.017**
Male	8 (18.2)	70 (37.0)	
Female	36 (81.8)	119 (63.0)	
Race (%)			0.447
Caucasian	41 (93.2)	170 (89.9)	
African American	3 (6.8)	9 (4.8)	
Asian	0 (0)	5 (2.6)	
Other	0 (0)	5 (2.6)	
BMI (Mean, SD)	32.6 (9.3)	27.7 (6.6)	< **0.0001**
Tobacco Use (%)			< **0.0001**
Current	11 (25.0)	7 (3.7)	
Former	16 (36.4)	46 (24.3)	
Never	11 (38.6)	136 (72.0)	
Disease Type (%)			0.85
Crohn's	30 (68.2)	122 (64.6)	
Ulcerative Colitis	13 (29.5)	63 (33.3)	
Indeterminate	1 (2.3)	3 (1.6)	
Duration of Disease in Years (Mean, SD)	15.9 (10.5)	13.8 (11.5)	0.2826
Active Disease (%)	24 (54.5)	96 (50.8)	0.7384
History of Bowel Surgery (%)	26 (59.1)	62 (32.8)	**0.0017**
Steroid Use in the Past 3 Months (%)	11 (25)	31 (16.4)	0.1942

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S939

Effect of Obesity on Inflammatory Bowel Disease (Ulcerative Colitis vs Crohn's Disease)

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Introduction: Obesity is a leading cause of death worldwide. There has been a noted association between obesity and worsened clinical outcomes in patients with certain autoimmune diseases. We aimed to investigate the impact of obesity on the outcomes of hospitalized patients with Ulcerative Colitis compared to patients with Crohn's Disease.
Methods: The National Inpatient Sample (NIS) database was queried for the years 2015-2019. Adult patients (>age 18) with a diagnosis of Ulcerative Colitis and obesity versus patients with Crohn's Disease and Obesity, were identified using ICD-10 codes. The primary outcome was inpatient mortality. Secondary outcomes were hospital length of stay (LOS) and total hospital charges (TOTHC). Complication rates for each group were analyzed. Multivariate logistic and linear regression analysis was used accordingly to adjust for confounders. Statistical analysis was performed using STATA.
Results: We identified 245,886 patients who had Inflammatory Bowel Disease (IBD) (both UC and CD) and 31,389 had obesity and IBD. 96,303 had ulcerative colitis with 12,587 obese patients and 149,583 had Crohn's disease with 18,802 obese patients. After propensity score matching, patients with obesity and Ulcerative Colitis had increased mortality (OR 1.45, p< 0.0001, CI: 1.19-1.77), TOTHC ($10,068, p< 0.0001, CI: $7,785-$12,351), and LOS (0.45 days, p< 0.0001, CI: 0.30-0.61) compared to patients with obesity and Crohn's Disease. Multivariate regression revealed that patients with obesity and UC had higher complications rates of deep vein thrombosis (OR 2.96, p=0.376, CI 0.27-5.65), pulmonary embolism (OR 1.30, p< 0.002, CI: 1.10-1.53), sepsis (OR 1.17, p< 0.0001, CI: 1.10-1.27), gastric perforation (OR 1.15, p=0.642, CI: 0.62-2.15), esophageal perforation (OR 2.96, p=0.210, CI: 0.54-5.38) and malnutrition (OR 1.31, p< 0.0001, CI 1.18-1.46). However, interestingly, this patient population had lower rates of colon and rectal perforation (OR 0.82, p=0.191, CI: 0.62-1.10) and duodenal perforation (OR 0.79, p=0.157, CI 0.57-1.10) compared to patients with obesity and CD.
Conclusion: Patients with obesity and UC had higher mortality, TOTHC, and LOS compared to obese patients with CD. Complication rates were noted to be higher in obese patients with UC. Obesity has overall increased among patients with IBD in recent years, thus, this is an important study that evaluates the outcomes and complications in this patient population.

S940

Small Bowel Capsule Endoscopy Utility in Patients With High Suspicion of Inflammatory Bowel Disease After Negative MRE/CTE

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Introduction: Patients with a high suspicion of inflammatory bowel disease (IBD) routinely undergo magnetic resonance enterography (MRE) and computed tomography enterography (CT)E. Video capsule endoscopy (VCE) is an additional tool used by clinicians to visualize the small bowel for IBD. How VCE is utilized by clinicians in combination with MRE/CTE is not well defined. Often, MRE and CTE are used as first line imaging techniques to assess the small bowel. In this study, we sought to assess the utility of VCE in patients being evaluated for IBD following a normal MRE and/or CTE.
Methods: We performed a retrospective review of VCE using a tertiary-care center's PillCam database from 8/3/2018-8/18/2021. Patients undergoing VCE for the evaluation and diagnosis of IBD were included. We then reviewed these patients' charts to investigate whether or not a MRE or CTE were performed within 1 year of VCE.
Results: The study population included 83 patients (57% female, average age 41.8 years [range 20-75 years]). Four patients underwent VCE two separate times, totaling 87 procedures. Fourteen (17%) patients underwent a MRE within 1 year (average of 120 days) prior to VCE. Of these, 5 had positive findings for active small bowel IBD and 9 had negative findings on MRE. Among those with negative MRE, reasons for subsequent VCE included follow-up assessment of known IBD (2 patients), anemia (1), ongoing symptoms concerning for IBD (4), and findings of terminal ileum pathology on colonoscopy (2). VCE showed findings of active IBD in 33% (3) of the patients with previous negative MRE. Seven (8%) patients underwent CTE within 1 year (average of 148 days) prior to VCE. Of these, 4 patients had no evidence of active IBD on CTE. In these patients, VCE was subsequently performed for follow-up assessment of known IBD (2), findings of terminal ileum pathology on colonoscopy (1), and ongoing symptoms concerning for IBD (1). VCE showed findings of active IBD in 50% (2) of the patients with previous negative CTE.
Conclusion: Although MRE and CTE are highly sensitive for small bowel IBD, VCE provides an additional method to assess for evidence of IBD in the small bowel. In this study conducted in usual clinical practice, 33% of patients with negative MRE and 50% with negative CTE still had active IBD seen on VCE. The data presented in this study supports the use of VCE when suspicion for active IBD is high despite negative cross sectional imaging results.

S941

Factors Associated With Delayed Corticosteroid Treatment for Patients With Acute Flares in Inflammatory Bowel Disease and Hospital Outcomes

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Introduction: Patients with inflammatory bowel disease (IBD) flares can suffer from abdominal pain, diarrhea, and hematochezia that may lead to hospitalization. Acute management of IBD flares includes steroids to alleviate symptoms and control inflammation. However, administration of steroids is often delayed until infectious processes are ruled out. We therefore investigated the factors that most often lead to delayed steroid administration and how the timing of administration affects the outcomes of hospitalized patients with IBD flares.
Methods: We conducted a retrospective chart review of 257 adult patients with IBD not on chronic steroids who were hospitalized for an IBD flare. We defined the timing of steroid administration as the time from the initial encounter with a healthcare provider to the first dose of a steroid. We compared mortality, length of stay (LOS), infections, and need for colonoscopy between patients who were started on steroids within 24 hours, 24-48 hours, 48-72 hours, and >72 hours. Chi-square, Fisher exact test, and Student's t-tests were performed for descriptive analysis to report demographics and other health-related measurements. The multivariable regression models were adjusted for age, Charlson Comorbidity Index score (CCI), abnormal labs, and chief complaints.
Results: Of the 257 patients, 46.7% were males, mean age was 44.5 years, and 66% had Crohn's disease. One hundred fifty-eight patients (61.5%) received steroids within 24h, 51 (19.8%) 24-48h, 26 (10.1%) 48-72h, and 22 (8.6%) >72h. Fever, diarrhea, and elevated ESR and CRP were more prevalent in patients who received steroids within 48-72h (p= 0.0208, 0.0367, 0.0117, and 0.0163, respectively) compared to those who received steroids within 24h, but not any other time frame. Average LOS was greater among patients given steroids >72h (8.5 days) when compared to those given steroids within 24h (4.8 days), 24-48h (4.2 days), 48-72h (5.4 days). In secondary outcome analysis, patients started on steroids >72h resulted in more days on opioid in-hospital compared to < 24h. (Table)
Conclusion: There were no symptoms nor lab abnormalities that reliably affected timing of steroids. Fever and diarrhea inconsistently delayed steroid administration, likely for concern that the immunosuppressive effect of steroids may worsen an existing infection. While steroid timing does not affect mortality or readmission rate, early recognition of IBD flare and prompt initiation of steroids may shorten hospital stay and days on inpatient opioids.

Table 1. Baseline characteristics of IBD patients with an ED visit and were admitted with an IBD flare, in Rhode Island, from April 2015 to December 2019

Patient encounter characteristics	Steroid initiation study groups							Overall (n=257)
	Within 24 hours (n=158, 61.5%)	24-48 hours (n=51, 19.8%)	P-value	48-72 hours (n=26, 10.1%)	P-value	More than 72 hours (n=22, 8.6%)	P-value	
Male gender, no. (%)	73 (46.2)	28 (54.9)	0.2797	10 (38.5)	0.4623	9 (40.9)	0.6404	120 (46.7)
White or Caucasian race, no. (%)	134 (84.8)	47 (92.2)	0.1817	17 (65.4)	**0.0182**	17 (77.3)	0.4913	215 (83.7)
Hispanic or Latino	16 (10.2)	0 (0.0)	**0.0140**	3 (11.5)	0.7371	4 (18.2)	0.2780	23 (9.0)
Age at admission, mean (SD)	44.2 (18.1)	44.2 (21.5)	0.9799	44.4 (17.9)	0.9529	47.7 (19.7)	0.3991	44.5 (18.9)
Smoking			0.4865		**0.0226**		0.2792	
Never	82 (51.1)	23 (45.1)		9 (34.6)		15 (68.2)		129 (50.2)
Past smoker	42 (26.6)	18 (35.3)		7 (26.9)		5 (22.7)		72 (28.0)
Current	34 (21.5)	10 (19.6)		9 (34.6)		2 (9.1)		55 (21.4)
Chief of complaint at ED								
Abdominal pain	97 (61.4)	28 (54.9)	0.4111	11 (42.3)	0.0670	12 (54.6)	0.5381	148 (57.6)
Diarrhea	6 (3.8)	5 (9.8)	0.1416	4 (15.4)	**0.0367**	3 (13.6)	0.0820	18 (7.0)
Bleeding	11 (7.0)	4 (7.8)	0.7635	0 (0.0)	0.3681	1 (4.6)	1.0000	16 (6.2)

Table 1. (*continued*)

Patient encounter characteristics	Steroid initiation study groups							
	Within 24 hours (n=158, 61.5%)	24-48 hours (n=51, 19.8%)	P-value	48-72 hours (n=26, 10.1%)	P-value	More than 72 hours (n=22, 8.6%)	P-value	Overall (n=257)
Nausea/vomiting	2 (1.3)	1 (2.0)	0.5700	0 (0.0)	1.0000	0 (0.0)	1.0000	3 (1.2)
Fever	2 (1.3)	2 (3.9)	0.2506	3 (11.5)	**0.0208**	2 (9.1)	0.0737	9 (3.5)
Other	41 (26.0)	11 (21.6)	0.5292	10 (38.5)	0.1866	4 (18.2)	0.4305	66 (25.7)
Rectal bleeding[a]	102 (64.6)	32 (62.8)	0.8146	17 (65.4)	0.9348	14 (63.6)	0.9326	165 (64.2)
In-hospital transfusion	19 (12.0)	3 (5.9)	0.2139	4 (15.4)	0.7479	1 (4.6)	0.4750	27 (10.5)
Abnormal lab[b]	109 (70.0)	38 (74.5)	0.4528	25 (96.15)	**0.0039**	18 (81.8)	0.2161	190 (73.9)
Lab at admission, mean (SD)								
Albumin	3.6 (0.6)	3.5 (0.6)	0.3269	3.6 (0.5)	0.7003	3.6 (0.6)	0.6057	3.6 (0.6)
CRP	67.0 (70.8)	79.6 (72.8)	0.3207	105.9 (82.5)	**0.0163**	101.6 (61.3)	0.0518	77.3 (72.9)
Sed rate	46.2 (28.0)	50.9 (34.5)	0.3988	68.8 (37.9)	**0.0117**	55.2 (36.6)	0.2309	50.7 (32.0)
Disease type			0.9119		0.1302		0.1477	
Crohn's Disease	104 (65.8)	34 (66.7)		21 (80.8)		11 (50.0)		170 (66.2)
Ulcerative Colitis	54 (34.2)	17 (33.3)		5 (19.2)		11 (50.0)		87 (33.9)
History of colon cancer	2 (1.3)	1 (2.0)	0.5700	0 (0.0)	1.0000	1 (4.6)	0.3253	4 (1.6)
Family history of IBD	4 (2.5)	0 (0.0)	0.5741	0 (0.0)	1.0000	0 (0.0)	1.0000	4 (1.6)
Family history of colon cancer	7 (4.4)	4 (7.8)	0.4687	0 (0.0)	0.5957	2 (9.1)	0.3027	13 (5.1)
CCI, mean (SD)	0.7 (1.7)	1.4 (3.0)	0.1094	1.4 (3.0)	0.1094	1.0 (2.2)	0.4899	0.8 (2.1)

Abbreviations: ASA – amino salicylic acid; BT – Biological therapy; CCI – Charlson comorbidity index; CRP – C-Reactive Protein; ED – Emergency department; SD – standard deviation; TNF – Tumor necrosis factor.
Notes: a – Rectal bleeding on presentation or during hospitalization; b – Abnormal lab (C reactive protein, or sedimentation rate (ESR), or fecal cal protein; c – 5-ASA types are mesalamine, sulfasalazine, apriso, lialda, or balsalazide.

S942

Initial Descriptive Epidemiology of Inflammatory Bowel Disease in Northern Central America

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Introduction: The incidence of inflammatory bowel disease (IBD) is rising globally, and recent studies in Latin America have demonstrated an increase in the number of patients with IBD. Northern Central America (CA) is the core low-middle-income countries (LMIC) region in the Western Hemisphere. Populations in development transition such as this have seen an increase in gastrointestinal diseases and cancers. However, the prevalence and general characteristics of IBD behavior remain undetermined in CA. Hence, we present the initial descriptive epidemiology of IBD in the area.
Methods: We conducted a retrospective chart review of five principal hospitals and clinics with practicing gastroenterologists in Guatemala and Honduras. Cases were identified based on the international classification of disease (ICD) 10 IBD codes in the last ten years (2010-2020). Sociodemographic and clinical characteristics data were collected and analyzed using STATA 17.
Results: A total of 107 patients with IBD were identified, including 60 with ulcerative colitis (UC), 27 with indeterminant colitis (IC), and 20 with Crohn's disease (CD). The median age at diagnosis was 42.7 years (IQR, 24.9, 50.7) in both sexes. Males were more commonly affected (56%), and 59.8% were from urban areas. Smoking was reported in 16 (6.7%) patients. Common clinical presentations were diarrhea, abdominal pain, anemia, and acute kidney injury (Table). The mean time between the onset of symptoms and diagnosis was 2.5+/-2.9 SD years. The most common complication was enteric fistula (6.5%). Pancolitis was found in 17% and colon cancer in 1% of included patients. The most common treatments were systemic steroids (IC, 74%; UC, 41%, CD 68%) and sulfasalazine (45%). Only 17 (15.9%) patients required surgery during the study period, and very few had access to biological agents (13%).
Conclusion: This study supports the clinical impression that IBD is on the rise in CA LMIC setting. The most prevalent type of IBD among these populations is UC. Given the tendency towards a diagnosis of infectious colitis and the lack of data from private practice centers, these numbers are likely an underestimate. The use of steroids in this region is high. Moreover, the use of mesalamine compounds even for CD is common, likely due to the limited access to biologics. This study is the first step in describing the characteristics of IBD in the region, and the results can be used to help shape public health strategies in the region.

Table 1.

	N (%)	UC	CD	IC
	107	60	20	27
Sociodemographic				
Age, median (IQR), years	42.7 (26.4, 55.4)	37.4 (24.9, 50.7)	44.4 (33.8, 45.9)	55.4 (27.1, 63.5)
Age categories[a]				
< 18	15 (14.6%)	10 (17%)	3 (17%)	2 (7%)
18-24	10 (9.7%)	5 (9%)	1 (6%)	4 (15%)
25-64	68 (66%)	40 (69%)	13 (72%)	15 (56%)
>64	10 (9.7%)	3 (5%)	1 (6%)	6 (22%)
Sex[b]				
Male	59 (56.2%)	28 (47%)	15 (79%)	16 (62%)
Female	46 (43.8%)	32 (53%)	4 (21%)	10 (38%)
Setting				

Table 1. (*continued*)

	N (%)	UC	CD	IC
Urban	64 (59.8%)	37 (62%)	15 (75%)	12 (44%)
Rural	43 (40.2%)	23 (38%)	5 (25%)	15 (56%)
Tobacco	16 (6.68%)	8 (13%)	0 (0%)	8 (30%)
Alcohol	35 (32.7%)	17 (28%)	7 (35%)	11 (41%)
Clinical Characteristics				
Median interval from onset to diagnosis (range) years	1 (1, 2)	1 (1, 2.5)	3 (2, 7)	1 (1, 1)
Clinical Presentation				
Diarrhea	79 (73.8%)	47 (78%)	11 (55%)	21 (78%)
Abdominal Pain	76 (71.0%)	42 (70%)	15 (75%)	19 (70%)
Bloody Diarrhea	40 (37.4%)	28 (47%)	9 (45%)	3 (11%)
Hemoglobin				
< 7 g/dl	23 (21.5%)			
7-12 g/dl	53 (49.6%)			
>12 g/dl	23 (21.5%)			
Complications				
Pancolitis	17 (15.9%)	12 (20%)	2 (10%)	3 (11%)
Enteric fistulas	7 (6.5%)	1 (2%)	6 (30%)	0 (0%)
Colon Stenosis	2 (1.9%)	2 (3%)	0 (0%)	0 (0%)
Colon Cancer	1 (0.9%)	1 (2%)	0 (0%)	0 (0%)

[a]Missing = 4
[b]Missing = 2
UC: Ulcerative Colitis, CD: Crohn's Disease, IC: Indeterminate Colitis.

S943

A New Population With Inflammatory Bowel Disease: Clinical Characteristics of IBD in the Chaldean Population

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Introduction: The Chaldean people originate from ancient Babylon, Mesopotamia, known as Iraq in modern times, with a population of approximately 2 million, with 500,000 in the US. It has been anecdotally observed that many Chaldeans suffer from inflammatory bowel disease (IBD), however there is little known about IBD in this population. Cho et al. described four Chaldean families and reported linkage and linkage disequilibrium at chromosome band 1p36 associated with IBD, but no clinical characteristics have been described. The aim of this study is to describe the clinical characteristics of IBD in the Chaldean population.
Methods: This was an online survey study sent to the Chaldean community in Michigan via social media platforms. Data collected included demographic information, IBD specific characteristics, family history and barriers to seeking care. Patients who were < 18 years old (y), did not identify as Chaldean or have a diagnosis of IBD were excluded.
Results: A total of 74 patients completed the survey (18 excluded due to age, diagnosis uncertainty). Of the 56 completed surveys, 25 (44.6%) with ulcerative colitis (UC), 22 (39.2%) with Crohn's disease (CD), 9 (16%) with IBD-unspecified (IBD-U). Median age 31y (Range 19-55y), median duration of disease 9y (Range 1-28y) and median age of onset of disease 25y (Range 5-52y). 42 (75%) were females. 12 (21%) have a history of surgery for disease complications. 35% have first degree relative with IBD, 53% have second degree relative with IBD. 66% report delays in seeking medical attention after first symptoms, with minimization of symptoms and embarrassment being the most common reasons. Other reasons included fear, insurance issues and life stressors. (Table)
Conclusion: This is the first study to describe clinical characteristics of Chaldean patients with IBD. We found similar rates of UC and CD in our survey population. There are more Chaldean females with IBD, compared to equal rates of males and females with IBD in the general population. In the Chaldean population, we found a significantly higher family history of IBD than the general IBD population which is reported at 8-14%. Despite a strong family history and presumed more exposure to those with IBD, most patients delay seeking medical attention for their symptoms. Further studies are indicated to describe IBD characteristics, clinical course, prognosis and genetic evaluation in the Chaldean population.

Table 1. **Title: Demographic and Clinical Characteristics of 56 Chaldean Patients with IBD**

Variables	N=56
Median age, y (Range)	31 (19-55)
Median age of diagnosis, y (Range)	25 (5-52)
Median duration of disease, y (Range)	9 (1-28)
Females, n (%)	42 (75)
Delays to seeking care, n (%)[1]	37 (66)
Minimization of symptoms, n (%)	10 (42)
Embarrassment, n (%)	6 (25)
Fear, n (%)	3 (13)
Life stressors, n (%)	3 (13)
Insurance barriers, n (%)	2 (8)

1= 24 participants provided reasons for delays to seeking care; y = years

S944

Longitudinal Changes in Bone Density in High-Risk Patients With Inflammatory Bowel Disease

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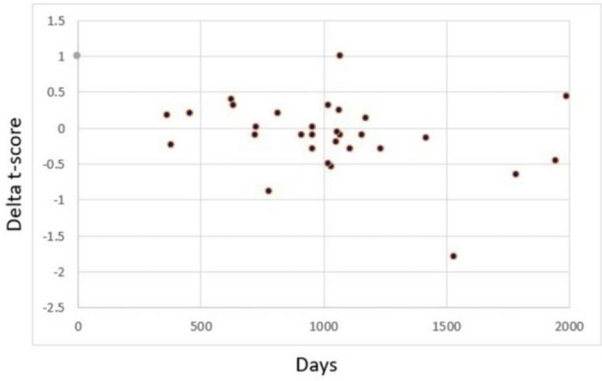
Introduction: Bone Mineral Disease (BMD) is an established complication of Inflammatory Bowel Disease (IBD). Dual-energy X-ray absorptiometry (DEXA) scans are recommended in this patient population, but there is a lack of clarity on what the interval between serial scans should be. We sought to quantify the change in bone mineral density over time in high-risk patients with IBD.
Methods: We identified patients with IBD from a safety net health network who underwent DEXA scans based on risk factors for bone mineral disease. T-scores and days between scans were quantified in patients with at least two DEXA scans at least one year apart. The primary outcome of interest was mean change in T-score over time (in days).
Results: A cohort of 121 patients with DEXA results were identified; of these, 36 patients had serial DEXA scans. Demographic data showed mean age of 56, 73% females, 32% with tobacco use, 35% with alcohol use, and 54% with exposure to steroids for longer than 3 months. 13 patients had ≥3 DEXAs, 6 patients had ≥4, and 3 had ≥5. Mean change in T-score per year was -0.04 per year. The majority (34/36) patients maintained a T-score change between +0.5 and -0.5 over 5 years (Figure). Three patients were started on bisphosphonate therapy and subsequently showed a mean increase of BMD of +0.05 per year.
Conclusion: Change in T-scores in this high-risk IBD population remained similar from 0 to 5 years after initial DEXA scan. A repeat DEXA scan within a 5-year interval may not be warranted in high-risk patients with IBD.



[0944] **Figure 1.** Delta T-score over time (days)

S945

Diagnostic Accuracy of Convolutional Neural Network-Based Machine Learning Algorithms in Endoscopic Severity Prediction of Ulcerative Colitis: A Systematic Review and Meta-Analysis

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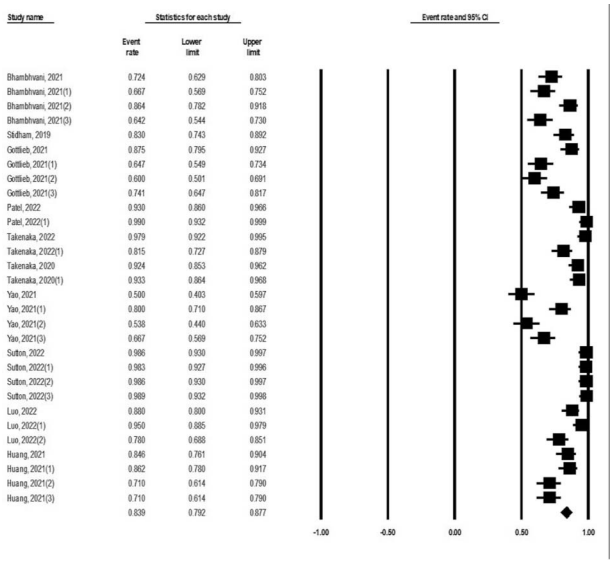
Introduction: Endoscopic severity of ulcerative colitis (UC) predicts clinical outcomes and is essential to guide treatment and evaluate therapeutic response. The Mayo endoscopic score (MES) is commonly used to objectively classify mucosal damage. It ranges from 0 to 3, with a higher score reflecting increased severity. With advances in machine learning, artificial intelligence is being employed for automating image analysis. Convolutional neural network (CNN) is a powerful deep learning method for image recognition, and in this study, we aim to look at diagnostic accuracy parameters of CNN based machine learning algorithms to predict UC severity.
Methods: Multiple databases, including Medline, Scopus, and Embase, were searched from inception to May 2022 using specific terms for studies evaluating the diagnostic accuracy parameters of machine learning algorithms in assessing UC severity. Inclusion was restricted to studies that employed CNN based algorithms. Outcomes of interest were the pooled accuracy, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). Multiple 4X4 contingency Tables assessing the diagnostic accuracy of the algorithms were considered independent of each other as the goal was to study the overall direction of pooled rates and not calculate precise point estimates. Standard meta-analysis methods were employed using the random-effects model, and heterogeneity was assessed using the I^2 statistics.
Results: 12 studies were included that exclusively used CNN algorithm. Studies that used support vector machines or a combination were excluded. The CNN algorithm was trained and tested to predict Mayo score severity 0, 1, 2 & 3, individually in majority of the studies. In few studies the CNN algorithm was used to differentiate between Mayo 0 vs 1, and Mayo 0-1 vs 2-3. Although, 'ground-truth' differed, individual 4X4 Tables were considered as independent of each other for the purpose of this study. The pooled rate were as follows: Accuracy 91.2% (95% CI; 87.4-93.9, I^2=84%), sensitivity 83.9% (79.2-87.7, 89%), specificity 82.3% (89.5-94.4, 84%), PPV 86.5% (980.7-90.8, 89%) and NPV 89.4% (85.8-92.2, 78%) (Figure).
Conclusion: Based on our meta-analysis of 12 studies, CNN-based machine learning algorithms demonstrated excellent pooled diagnostic accuracy parameters. Further work seems to be needed to get the NPV >90. Future well-controlled studies are warranted to establish its clinical use in comparison to endoscopists' assessment of colonoscopic UC severity (Table).



[0945] **Figure 1.** Forest Plot for sensitivities of selected studies

Table 1. **Pooled rates of outcomes of interest**

Outcome	Pooled rates (95% confidence interval, I^2 % heterogeneity)
Accuracy	91.2% (87.4-93.9, 84%) 20 datasets
Sensitivity	83.9% (79.2-87.7, 89%) 30 datasets
Specificity	92.3% (89.5-94.4, 84%) 30 datasets
PPV	86.5% (80.7-90.8, 89%) 18 datasets
NPV	89.4% (85.8-92.2, 78%) 18 datasets

S946

Hereditary Alpha Tryptasemia May Act as a Disease Modifier in Inflammatory Bowel Disease

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Introduction: Hereditary alpha tryptasemia (HaT, ICD-10 D89.44) is an autosomal dominant genetic trait present in up to 6% of individuals of European ancestry. Approximately, 1/3 of individuals with this genetic trait are symptomatic. Typically, individuals with symptomatic HaT present with skin, nerve, or GI manifestations and a tryptase of >8 ng/ml. HaT is independently associated with an increased risk of anaphylaxis. Diagnosis is confirmed by performing digital droplet PCR to confirm extra copies of TPSAB1 (>4) which is located on chromosome 16. Major GI symptoms include esophageal reflux, abdominal pain, diarrhea, constipation, and gastrointestinal food sensitives. We have previously shown that HaT is associated with increased mast cell numbers, accelerated epithelial pyroptosis (inflammatory cell death), and increased class switch memory B cells in the small intestine in absence of a gut inflammatory disorder.
Methods: Our teritary academic center follows large, well characterized HaT population (n=134). Within this population, we noted that 8 individauls had been diagnosed with either Crohn's or ulcerative colitis. To better understand the impact of HaT on inflammatory bowel disease (IBD), we gathered data on age of IBD diagnosis, number of advanced IBD therapies tired, numbers of surgeries,average basal serum tryptase (BST) levels, and response to current IBD therapy.
Results: Of the 8 individuals with HaT and IBD, 7 had Crohn's disease and 1 had pancolonic ulcerative colitis. 50% of the individuals in this cohort were diagnosed prior to age 20. Five of eight patients had had a bwel resection for treatment of Crohn's. On average, the individuals in this cohort had failed at least 3 advanced IBD therapies. The average BST was 17.3 ng/ml (Non IBD HaT cohort has average BST of 14). Six of eight patients experienced endoscopic remission on a JAK inhibitor (tofacitinib or upatacitanib). Two of eight patients experienced clinical improvement with ustekinumab.
Conclusion: Our data indicates that IBD appears to be more common and severe in individuals with a HaT (IBD prevalence in the general population is estimated to be 1.3% but in this HaT cohort, it is 6%). Future studies are needed to understand whether or not HaT acts as a disease modifier in IBD.

S947

Impact of Malnutrition on Readmission Rate in Patients Admitted With Inflammatory Bowel Disease: A Nationwide Analysis

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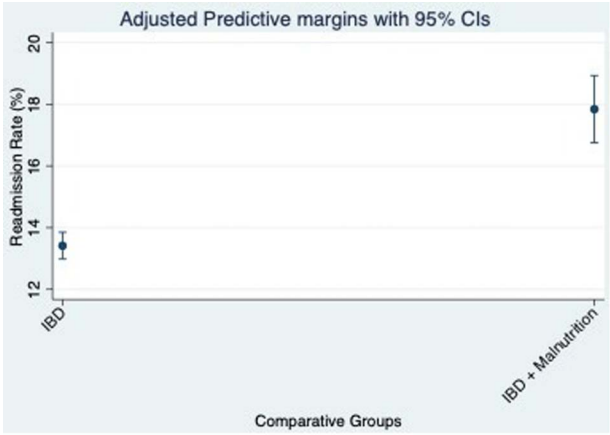
Introduction: Malnutrition is a common complication in patients with Inflammatory Bowel Disease (IBD) because of chronic inflammation in the gut. It negatively impacts patients' quality of life. Our study aimed to evaluate the impact of malnutrition on the readmission rate in patients hospitalized with IBD in the US.
Methods: National Readmission Database (NRD) for 2019 was queried using ICD-10-CM Codes to identify a cohort of IBD admissions with and without Malnutrition. A weighted sample was used to get baseline characteristics and a 30-day readmission rate. Univariate and multivariate logistic regression analyses were used to analyze unadjusted and adjusted odds of readmission.
Results: Among 76480 patients admitted with IBD, 11564 (15.1%) also had a concurrent diagnosis of malnutrition. Patients with malnutrition had a higher Charlson Comorbidity Index. Our cohort was broadly admitted to large urban teaching hospitals. Compared to patients with malnutrition, there were larger proportions of patients with private insurance without Malnutrition (41.5% vs. 45.1%). The 30-day all-cause readmission rate was higher in malnourished IBD patients compared to non-malnourished (18.4 vs. 13.3, p-value < 0.01). The adjusted Odds of Readmission for IBD patients with malnutrition were 1.41 times higher (95% CI 1.30-1.52) than those without malnutrition. The top 5 diagnoses for readmission included complications due to IBD and sepsis. There was an increased proportion of readmissions with sepsis in patients with malnutrition compared to the baseline group (6.4% vs. 5.7%). (Table)
Conclusion: Our study shows that malnutrition was associated with a significantly higher risk of 30-day readmission in patients admitted with IBD. In addition, these patients are at increased risk of readmission due to infection. Frequent hospitalizations in IBD patients put a substantial burden on the health care system. Therefore, careful attention is needed for early screening and prompt management of malnutrition in inpatient and outpatient settings to decrease the risk of hospitalization in this patient population. (Figure).



[0947] **Figure 1.** IBD: Inflammatory Bowel Disease ; IBD+Malnutrition: Inflammatory Bowel Disease with Malnutrition

Table 1. Adjusted for Age, Charlson Comorbidity Index, Hospital (Location, Teaching status), Insurance status

Variables	IBD without Malnutrition (64916)	IBD with Malnutrition (11564)	p-value
a) Baseline Patient and Hospital Characteristics			
Age (SD)	46.7 (18.8)	47.0 (19.9)	0.35
Female (%)	35385 (54.5)	5611 (48.5)	< 0.01
Charlson Comorbidity Index (SD)	0.70 (1.4)	0.86 (1.6)	< 0.01
Hospital Type (%)			
Urban	63920 (98.5)	11511 (99.5)	< 0.01
Teaching	48284 (74.4)	9520 (82.3)	< 0.01
Hospital Bed Size (Large)	34524 (53.2)	7213 (62.4)	< 0.01
Payer Information (%)			< 0.01
Medicare	18044 (28.9)	3605 (32.4)	
Private Insurance	28110 (45.1)	4622 (41.5)	
Disposition (%)			< 0.01
Home AMA Died	56907 (87.7) 1846 (2.9) 112 (0.2)	7982 (69.1) 160 (1.4) 163 (1.4)	
30 Days Readmission Rate	8060 (13.3)	1953 (18.4)	< 0.01
b) Adjusted and Unadjusted Odds of Readmission (With IBD without Malnutrition as Reference)			
Unadjusted Odds of Readmission	1.46 (95% CI 1.35-1.58)		< 0.01
Adjusted Odds of Readmission	1.41 (95% CI 1.30-1.52)		< 0.01

IBD: Inflammatory Bowel Disease ; SD: Standard Deviation; AMA : Against Medical Advice; CI: Confidence Interval

S948

Relationship Between Hospitalization, Surgery and Achievement of Clinical Remission or Clinical Response in Moderate to Severe Crohn's Disease Patients: Results From the UNITI/IM-UNITI Trials

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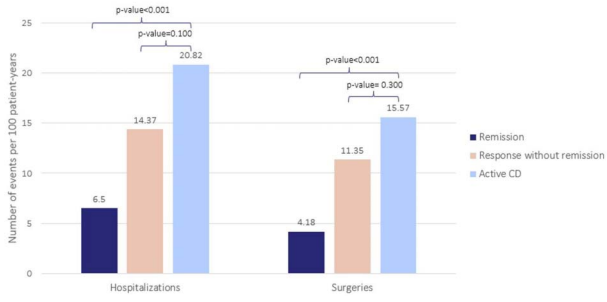
Introduction: Crohn's disease (CD) is a chronic disease with high burden for patients and payers. Treatment aims include induction and maintenance of clinical remission (CRem). Understanding the relationship between rates of hospitalization and surgery and health states can help determine the economic burden. This analysis used results from the UNITI/IM-UNITI trials (CNTO1275CRD3001-3) of patients with moderate to severe CD, to determine the relationship between hospitalization and surgery rates and each health state over 1 year.
Methods: Hospitalization and surgery data from UNITI/IM-UNITI were pooled across arms and across induction and maintenance phases. Based on CRem and response achieved at each visit (weeks 0-52), patients' exposure time were classified into three health states (HS) using the Crohn's Disease Activity Index score: CRem, clinical response without clinical remission (CResp) and active CD. Hospitalization and surgery events were assigned based on the HS at the visit prior to the event. The base case (BC) analysis included CD-related hospitalizations and surgeries only, a first sensitivity analysis was performed including both CD- and non-CD-related hospitalizations and surgeries, and a second sensitivity analysis was performed on patients randomized to maintenance only. Annualized rates were estimated by HS adjusting for the exposure time in each health state.
Results: The analysis included a total of 773 patients in CRem, 723 in CResp and 1,255 in active CD. BC results showed significantly fewer hospitalizations per 100 patient-years (PY) in CRem (6.50), and numerically fewer per 100 PY in CResp (14.37) compared to active CD (20.82). Similarly, patients in CRem had significantly fewer surgeries per 100 PY vs active CD (4.18 vs 15.57), and the difference was not statistically significant vs patients in CResp, who incurred 11.35 surgeries/100 PY. P-values are reported in Figure. CRem (9.11 days) and CResp (9.86 days) also had a numerically shorter mean duration of hospitalization compared to active CD (15.77 days). These results were consistent with those from both sensitivity analyses.
Conclusion: Annualized hospitalization and surgery rates from the UNITI/IM-UNITI trials were significantly lower for patients in CRem and lower but non-significantly for patients in CResp, compared to patients in active CD. CRem and CResp had a numerically shorter mean duration of hospitalization compared to active CD.

Figure 1. Annualized CD-related hospitalization and surgery rates in UNITI/IM-UNITI in each health state



[0948] **Figure 1.** Annualized CD-related hospitalization and surgery rates in UNITI/IM-UNITI in each health state

S949

Predictors of Urgent Findings on CT in Crohn's Disease Patients

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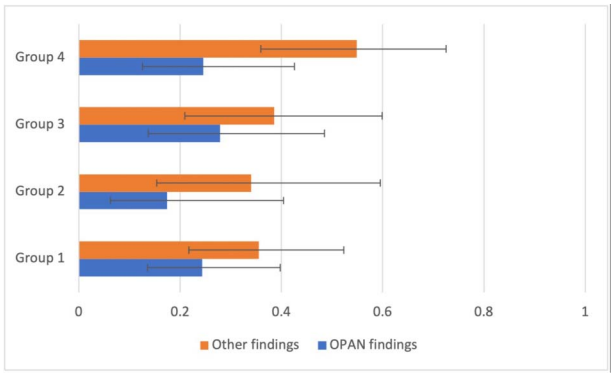
Introduction: Crohn's disease (CD) patients are exposed to substantial radiation from repeat CTs given multiple ED visits and early age of diagnosis, with concern that multiple scans infrequently identify clinically significant findings. Previous studies reported on predictors of urgent findings - obstruction, perforation, abscess, or non-CD urgent findings (OPAN) - on CT. We sought to identify patient characteristics correlating with increased number of scans and OPAN findings.

Methods: 660 CD patients from 4 gastroenterology practices presenting to one healthcare system with 3 hospitals from 4/15/15 to 12/31/18 were identified and cross-referenced with a radiology database search generating 1778 CT scans performed at these ED encounters. Presence of OPAN was noted. We manually chart reviewed a stratified random sample of 200 of these encounters, utilized cluster analysis to empirically group patients based on demographics and clinical profiles, and used generalized linear modeling to compare number of scans and meaningful clinical data between groups (Table).
Results: Patients presenting with acute and/or diffuse abdominal pain were more likely to undergo CT. Those with barriers to healthcare (including non-private insurance, missed outpatient appointments, infusion non-adherence, or limited English proficiency) had higher levels of ESR/CRP and increased rate of OPAN findings. Those with fewer barriers often had no/mild ESR/CRP elevations and lowest rate of OPAN findings. The group with the least biologic agent use and more missed appointments had the highest ESR/CRP and number of OPAN findings. A majority of patients with multiple ED visits and scans had anxiety/depression. The difference in rate of OPAN findings between each group was not statistically significant (Figure).
Conclusion: Prior studies have shown that positive predictors of OPAN include high WBC, tachycardia, elevated inflammatory markers, and use of opioids and steroids which may mask pain. Negative predictors include biologic use and recent negative CT. Our study raises concerns about the barriers to healthcare with missed outpatient appointments, repeat scans, and inconsistent identification of presence of OPAN. Without proper adherence to outpatient follow-up, patients who develop abdominal pain or CD-related symptoms are more likely to present to the ED and be subsequently scanned. This data highlights the importance of improving social determinants of healthcare resources for CD to ultimately reduce excess radiation exposure.



[0949] **Figure 1.** Probability of Clinical Findings by Group. "Other findings" include non-urgent findings on CT such as thickening, structuring, or fistulas.

Table 1. Grouping of patient encounters

	GROUP 1	GROUP 2	GROUP 3	GROUP 4
PRESENTING SYMPTOM				
Acute (< 48 hours) abdominal pain	47%	65%	95%	74%
Diffuse abdominal pain	76%	51%	60%	63%
VITALS / LABS				
Temperature	98	98	98	99
Heart rate	91 (88-95)	88 (83-94)	106 (99-112)	97 (92-102)
White blood cell (WBC) count	10 (9-11)	10 (9-12)	16 (14-19)	10 (9-11)
Erythrocyte sedimentation rate (ESR)	69 (56-89)	14 (10-19)	55 (40-79)	68 (53-91)
C-reactive protein (CRP)	76 (61-97)	3 (2-4)	49 (36-71)	73 (57-98)
OUTPATIENT MEDICATIONS				
Biologic use	60% (48-70%)	41% (27-57%)	63% (46-77%)	21% (12-34%)
Steroid use	31% (21-42%)	32% (19-47%)	49% (33-65%)	17% (9-30%)
Opioid use	51% (40-63%)	39% (25-55%)	60% (43-75%)	10% (4-21%)
SOCIAL FACTORS				
Medicare / Medicaid	22% (14-33%)	2% (0-16%)	9% (3-24%)	8% (3-19%)
Non-English speaking	21% (13-32%)	7% (2-20%)	6% (1-20%)	6% (2-17%)
History of anxiety / depression	72% (61-81%)	61% (45-75%)	60% (43-75%)	46% (33%-60%)
Missed outpatient appointments	25% (16-36%)	10% (4-23%)	9% (3-24%)	33% (21-47%)

S950

Impact of Malnutrition on Resource Utilization in Patients Admitted With Inflammatory Bowel Disease: A Nationwide Analysis

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Introduction: Malnutrition is a major complication of Inflammatory Bowel Disease (IBD), which is associated with poor clinical outcomes. The prevalence of malnutrition in IBD patients ranges from 18% to 85%, with a higher prevalence in hospitalized patients. Our study aimed to assess the prevalence of malnutrition in patients admitted with IBD and its influence on resource utilization in the US.
Methods: National Inpatient Sample (NIS) for 2019 was queried using ICD-10-CM Codes to identify a cohort of inpatient IBD admissions with and without malnutrition. First, a weighted sample was used to get baseline characteristics and resource utilization (length of stay and total hospital charges) during the inpatient admissions. Then, multivariate linear regression analysis followed by predictive margins of the model was used to get adjusted estimates of the length of stay and total hospital charges. (Figure)
Results: Among 92,740 patients hospitalized with IBD, 14420 (15.6%) patients had a concurrent diagnosis of malnutrition. Compared to males, there was less proportion of females having malnutrition (54.9% vs. 49.6%). Mean age was similar in IBD patients with and without malnutrition (47.4 years vs. 46.5 years). Compared to patients with malnutrition, there were larger proportions of patients with private insurance without malnutrition (45% vs. 48.4%). Malnutrition was associated with a significantly longer length of stay in IBD patients, 8.88 days (95% CI 8.52-9.24) vs. 4.23 days (95% CI 4.16-4.30) for patients without malnutrition in the adjusted model. Total hospital charges were also higher, $ 91392 (95% CI 83771-99014) with malnutrition vs. 44798$ (95% CI 42955-46640) for patients without malnutrition. Mortality was also higher in patients with malnutrition. (Table)

Conclusion: Our study shows that malnutrition was quite prevalent in hospitalized IBD patients. It was associated with increased mortality in the hospitalized cohort and prolonged length of stay. In addition, it resulted in increased hospital charges. Early recognition and intervention can improve health outcomes for patients with IBD. Future studies should also assess predictors for developing malnutrition in this patient population.

[0950] **Figure 1.** IBD: Inflammatory Bowel Disease; IBD+Malnutrition: Inflammatory Bowel Disease with Malnutrition

Table 1. Adjusted for Age, Charlson Comorbidity Index, Hospital (Location, Teaching status, Bed Size), Insurance status

Variables	IBD without Malnutrition (78320)	IBD with Malnutrition (14420)	p-value
a) Baseline Patient and Hospital Characteristics			
Age (SD)	46.5 (18.1)	47.4 (19.3)	0.03
Female (%)	43030 (54.9)	7150 (49.6)	< 0.01
Race (%)			0.33
White	56745 (73.9)	10360 (73.8)	
Charlson Comorbidity Index (SD)	0.70 (1.3)	0.86 (1.5)	< 0.01
Hospital Type (%)			
Urban	72735 (92.9)	13860 (96.1)	< 0.01
Teaching	59765 (76.3)	12090 (83.8)	< 0.01
Hospital Bed Size (Large)	39620 (50.6)	8575 (59.5)	< 0.01
Payer Information (%)			< 0.01
Medicare	20610 (27.4)	4405 (31.7)	
Private Insurance	36495 (48.4)	6250 (45.0)	
Disposition (%)			< 0.01
Home AMA Died	66595 (85.0) 1955 (2.5) 105 (0.1)	9550 (66.3) 170 (1.2) 165 (1.2)	
b) Resource Utilization			
LOS (Unadjusted)	4.19 (95% CI 4.11-4.26)	9.07 (95% CI 8.71-9.44)	< 0.01
LOS (Adjusted)	4.23 (95% CI 4.16-4.30)	8.88 (95% CI 8.52-9.24)	< 0.01
TOTAL CHARGES (Unadjusted)	44064 (95% CI 42229-45899)	94056 (95% CI 86272-101841)	< 0.01
TOTAL CHARGES (Adjusted)	44798 (95% CI 42955-46640)	91392 (95% CI 83771-99014)	< 0.01

IBD: Inflammatory Bowel Disease; SD: Standard Deviation; AMA: Against Medical Advice; LOS: Length Of Stay

S951

Bridging Healthcare Disparities in Inflammatory Bowel Disease (IBD) Through a Telehealth Hybrid Clinic Model

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Introduction: Due to increased prevalence of IBD and lack of access to specialized care, Henry Ford Health is offering a hybrid clinic model in rural areas, that offers patients the opportunity to physically present to a clinic near their homes where a nurse performs an intake, and an IBD specialist is available through telemedicine. This study was designed to identify barriers to IBD care, and the impact it has on healthcare cost and quality of life.
Methods: This is a retrospective chart review conducted at a large tertiary care center. Data were collected between July 2021 and March 2022. We included all adult patients with the diagnosis of Crohn's Disease and Ulcerative Colitis living in Michigan. The control group consisted of in person clinical encounters at the Henry Ford IBD center in Novi, Michigan. The intervention group consisted of hybrid clinic visits at the Saginaw Outreach clinic. We gathered data on IBD flares, hospitalization, medication compliance, need for surgery within the past year, and emergency department (ED) visits at both sites.
Results: There was a total of 68 patients in the outreach group compared to 134 patients in the control group. The analysis showed that 16.7% of the outreach group had presented to the ED within a year of their clinic visit compared to 18.3% in the control group (p=0.782). While 24.2% of the outreach group were hospitalized compared to 19.7% in the control group (p= 0.459). Finally, 37.9% of the patients in the outreach group had IBD complications necessitating surgical interventions within a year of their clinic visit compared to only 16.1% in the control group (p=0.001).
Conclusion: Providing cost-effective care that is available for patients with IBD was the main driving factor of our hybrid telehealth model. According to the system based and multinational review that we conducted this hybrid telehealth clinic is the first of its kind across the country. Financial challenges are a more prevalent barrier in accessing office-based care in rural areas. Our study supports the previously published results as patients at our outreach clinic had a higher rate of surgeries within a year before their initial telehealth visit, as they were twice more likely to have undergone surgery within the past year. This is attributed to the lower socioeconomic status and lack of access to specialized care. In conclusion, this is a longitudinal study to assess if the telemedicine clinic can aid patients in attaining clinical remission and improving quality of life.

S952

The Effect of Commonly Prescribed Renin-Angiotensin-Aldosterone System Blocking Agents on the 5- and 10-year Disease Course of Crohn's Disease Patients With Hypertension

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Introduction: Activation of the renin-angiotensin-aldosterone system (RAAS) has been associated with gastrointestinal inflammation and fibrosis, suggesting that blockade may be beneficial in patients with inflammatory bowel disease (IBD). Using retrospective analysis, we aimed to compare the disease course of Crohn's disease (CD) patients initiated on two commonly prescribed classes of RAAS-blocking agents.
Methods: Patients with CD and hypertension who were initiated on an angiotensin-converting-enzyme inhibitor (ACEI, n=40) or angiotensin-receptor blocker (ARB, n=40) between 2000-2016 were included. A control group (n=40) was created and matched on gender, body mass index, CD Montreal classification, age at CD diagnosis, CD duration, and common comorbid conditions. Data was collected on surrogate markers of IBD severity in the 3-, 5-, and 10-years following ACEI or ARB initiation. Surrogate markers included clinical (emergency department visits, hospitalizations, corticosteroid use, and biologic therapy use), radiological (computer tomography [CT], CT enterography, magnetic resonance imaging, magnetic resonance enterography), and procedural (endoscopic procedures, IBD-related operations) variables. Statistical analysis was performed by one-way multivariate analysis of variance with Tukey post-hoc testing.
Results: Compared to control, patients taking ARBs had fewer instances of systemic corticosteroid use (1.06 vs.2.88, p< 0.01, -63%) at the 10-year interval. On the other hand, patients taking ACEIs had an overall worse disease course, with more imaging studies (3.00 vs.1.75, p=0.03, +71%) and endoscopic procedures (2.70 vs. 1.78, p=0.01, +52%) at 5-years, and more imaging studies (6.19 vs.3.50, p< 0.01, +77%), endoscopic procedures (5.91 vs.3.78, p< 0.01, +56%), and IBD-related operations (0.59 vs.0.18, p< 0.02, +228%) at 10-years. ACEI-treated patients were also more likely to initiate biologic therapy compared to control (56.0% vs.32.3%) and ARB-treated patients (56.0% vs.17.4%).
Conclusion: Our study provides insight into the long-term use of RAAS-blocking agents in patients with CD, suggesting that differences exist between commonly prescribed medication classes. While ACEIs were associated with an overall worse disease course at 5- and 10-years, patients taking ARBs were noted to have fewer instances of corticosteroid use at 10-years. Given the frequent use of ACEI and ARB therapy, future large-scale studies are needed to further explore the association RAAS-blockade and IBD disease course (Table).

Table 1. Summary of clinical, radiological, and procedural surrogate markers of inflammatory bowel disease severity in the 3-, 5-, and 10-years following initiation of renin-angiotensin-aldosterone system blocking therapy

Variable	Average number of events per patient											
	3 years				5 years				10 years			
	CD-ACEI (n= 40)	CD-ARB (n= 40)	CD-Control (n= 40)	p-value	CD-ACEI (n= 40)	CD-ARB (n= 40)	CD-Control (n= 40)	p-value	CD-ACEI (n= 32)	CD- ARB (n= 33)	CD-Control (n= 40)	p-value
Emergency department visits (all)	1.25	1.50	1.90	0.33	2.52	2.30	2.60	0.87	5.34	3.91	6.1	0.10
Emergency department visits (abdominal pain)	0.58	0.48	0.48	0.87	1.05	0.60	0.75	0.29	2.34	0.91	1.70	< **0.02**
Hospitalizations (abdominal pain)	0.18	0.15	0.25	0.72	0.38	0.23	0.28	0.56	0.88	0.30	0.65	0.07
Systemic corticosteroid use (single instances)	0.63	0.35	1.00	0.09	1.53	0.45	1.28	**0.03**	3.72	1.06	2.88	< **0.01**
Abdominal imaging	2.05	1.55	1.25	0.12	3.00	1.83	1.75	< **0.02**	6.19	2.73	3.50	< **0.01**
Endoscopic procedures	1.45	0.90	1.05	0.12	2.70	1.60	1.78	< **0.01**	5.91	2.61	3.78	< **0.01**
Gastrointestinal operations	0.13	0.08	0.08	0.72	0.15	0.10	0.08	0.18	0.59	0.15	0.18	< **0.01**

Values are expressed as average number of events per patient at 3-, 5-, and 10-years following initiation of either an angiotensin-converting-enzyme inhibitor (ACEI) or angiotensin-receptor blocker (ARB). In case of control patients, values represent the average number of events per patient at 3-, 5-, and 10-years following start of follow-up interval. Emergency department visits included all visits as well as visits with abdominal pain as the chief complaint. Hospitalization included only those with abdominal pain as the chief complaint. Systemic corticosteroid usage was defined as single instances of systemic corticosteroid therapy. Abdominal imaging was defined as imaging of the abdominal area with Crohn's disease as the primary indication. Endoscopic procedures included colonoscopy, sigmoidoscopy, double balloon enteroscopy, esophagogastroduodenoscopy. Gastrointestinal operations were defined as operations with Crohn's disease as the primary indication (including colectomy, small bowel resection, ileocecectomy, and proctocolectomy). ACEI: Angiotensin-converting-enzyme inhibitor, ARB: Angiotensin receptor blocker, CD: Crohn's disease

S953

The Influence of Inflammatory Bowel Disease on Upper Gastrointestinal Malignancy

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Introduction: It is well known that Inflammatory Bowel Disease (IBD) increases the risk of developing Colorectal cancer. However, older works from the 1990's examined how Ulcerative Colitis and Crohn's Disease separately influence gastric and small bowel cancers as well. The aim of this nationwide investigation is to explore the current relationship between upper gastrointestinal malignancies and both Crohn's Disease and Ulcerative Colitis.
Methods: The National Inpatient Sample was queried for patients with a primary diagnosis of upper gastrointestinal malignancy and a secondary diagnosis of either Ulcerative Colitis or Crohn's Disease in 2014. Upper gastrointestinal malignancies were defined as esophageal cancer, gastric cancer, small bowel malignancy, or cholangiocarcinoma. The primary outcome is the relationship between Ulcerative Colitis, Crohn's Disease, and various forms of upper gastrointestinal cancer. Multivariate logistic regression was conducted using Stata v.13.
Results: In 2014, there were 175 patients with IBD, 105 of which had Crohn's Disease. Regression analyses demonstrated an increased association with upper gastrointestinal malignancies in both Crohn's Disease (aOR 2.08, p< 0.00) and Ulcerative Colitis (aOR 1.91, p=0.05). When stratified, there was a greater association between cholangiocarcinoma and Ulcerative Colitis (aOR 4.30, p< 0.00), as compared to Crohn's Disease (aOR 2.14, p=0.04). However, there was a strong relationship between small bowel cancer and Crohn's disease (aOR 11.88, p< 0.00), but no significant association with Ulcerative Colitis. With regard to esophageal and gastric malignancies, no significant relationship with either form of IBD was established.
Conclusion: There have been limited studies evaluating the relationship between upper gastrointestinal malignancies and either Crohn's Disease or Ulcerative Colitis. This study demonstrated that both conditions have an increased association with development of cholangiocarcinoma. Ulcerative Colitis poses a two-fold greater risk, likely due to its relationship with Primary Sclerosing Cholangitis. Moreover, Crohn's Disease offers a nearly six-fold increased risk of developing small bowel malignancy. Given its propensity to cause ileitis and intestinal strictures, dysplasia and cancer are worrisome possibilities. This is the first study in recent years to highlight the ability of both forms of IBD to influence development of extracolonic malignancies, which can be used to improve clinical evaluation in this population.

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Experiences With Bowel Preparation for Colonoscopy in Crohn's Disease

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Introduction: Patients with inflammatory bowel disease (IBD) require frequent colonoscopies. Crohn's disease (CD) may present unique challenges to bowel prep for colonoscopy due to the presence of strictures, fistulas, or prior bowel resections. Little is known about CD patients' experiences with bowel preps. The purpose of this study was to develop an in-depth understanding of experiences with bowel prep for colonoscopy in CD, from the perspectives of patients and providers.
Methods: We used a mixed methods approach, inviting CD patients ≥ 18 years of age scheduled for outpatient colonoscopy at two medical centers between July 2021-January 2022, and gastroenterologists, to participate in a survey and focus groups. Domains that were covered included experiences with existing bowel preps, including barriers to tolerance, and perceptions about ideal preps.
Results: A total of 144 patients completed the survey and 7 participated in focus groups, with 50% between 18-39 years of age, 56% female, 80% Caucasian, and 65% reporting good/excellent health status. CD phenotypes included 32% with strictures, 20% with fistulas, 35% with prior bowel surgeries, and 34% with active disease. Reported challenges to bowel preps included the inability to eat, volume of liquid required, and disruptions to work and sleep. Ideal preps were described as lower volume, more palaTable, and without the need to fast. Worry about the prep was one of the leading reasons that patients delayed their colonoscopies. Despite these challenges, 91% of patients would undergo colonoscopy again if recommended by their physician. Six gastroenterologists participated in the study. Volume, taste, and safety concerns were reported as limitations to currently-available preps. All agreed that, if available, they would favor a prep that was tested in CD patients. Barriers to optimizing colonoscopy bowel prep for CD patients included limited knowledge about ideal volume required, lack of standardization of dietary modifications, and lack of bowel prep quality scoring methods.
Conclusion: Bowel preparation is perceived as the most difficult part of undergoing colonoscopy among CD patients with worry about the prep as one of the leading causes of delaying colonoscopies. Given that CD patients may have altered anatomy due to their disease phenotypes and require frequent colonoscopies, future studies are needed to determine the optimal prep formulation, volume, and prep quality scoring methods for patients with CD.

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Effectiveness of Vedolizumab in Patients With Inflammatory Bowel Disease and Concomitant Primary Sclerosing Cholangitis

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Introduction: Patients with concomitant primary sclerosing cholangitis (PSC) and inflammatory bowel disease (IBD) are known to have a unique clinical phenotype (PSC-IBD), including higher expression of mucosal addressin cell adhesion molecule 1 (MAdCAM-1) in both liver and intestinal tissues. MADCAM-1 interacts with α4β7 integrin to allow access of lymphocytes to the intestinal mucosa and is inhibited by vedolizumab (VDZ). Although VDZ has not been shown to slow progression of PSC, little is known about its impact in intestinal inflammation of PSC-IBD patients. We aimed to report the effectiveness of VDZ in controlling intestinal inflammation in a large PSC-IBD cohort.
Methods: We conducted a retrospective review of patients with PSC-IBD treated with VDZ from January 2009 to January 2019. Demographic, clinical, endoscopic, and radiologic data were abstracted at baseline, and at 6 and 12 months after initiation of VDZ. Outcomes of interest included: clinical response, radiologic response and healing, endoscopic response, mucosal healing, and histologic healing.
Results: A total of 108 patients with PSC-IBD treated with VDZ were identified. The majority were male (66%), with median age of 45 years (range, 19 -83). The most common IBD subtype was ulcerative colitis (UC) (61.1%), followed by Crohn's disease (CD) (33.3%), and indeterminate colitis (5.6%). Median disease duration at the start of VDZ was 8 years (range, 0-50), with ileocolonic CD (85.3%) and pancolitis (92.2%) as the predominant disease locations. Over three quarters of the cohort (79.6%) had previously failed other biologic therapy (Table). VDZ was most often dosed every 8 weeks (73.1%) and the median duration of VDZ therapy was 17.5 months (range, 2-66). Clinical response was 72.6% at 6 months and 77.1% at 1 year. Among patients who had follow-up endoscopy, endoscopic response was noted in 47.1% and 58.1% of the cases at 6 months and 1 year, respectively. Radiologic response at 6 months and 1 year was 32.4% and 38.9%, respectively. Radiology healing at 6 months and 1 year was 16.2% and 18.2%, respectively. Histologic healing at 6 months was 6.7% and 18.8% at 1 year.
Conclusion: VDZ is effective in the management of intestinal inflammation in patients with PSC-IBD, with clinical and endoscopic outcomes at 1-year follow-up comparable to currently available clinical trials in non-PSC patients. Further studies comparing outcomes of PSC-IBD patients on VDZ to other biologic therapies are needed.

Table 1. Patient Demographics and Vedolizumab Outcomes

Patient demographics	N = 108
Male, n (%)	72 (66.7)
Median age, years (range)	45 (19-83)
Median disease duration, years (range)	8 (0-50)
Prior use of other biologics, n (%)	86 (79.6)
Combination therapy while on VDZ, n (%)	
Thiopurine/6MP/azathioprine	18 (17.3)
Methotrexate	1 (1.0)
IBD Subtype, n (%)	
CD	36 (33.3)
UC	66 (61.1)
Indeterminate colitis	6 (5.6)
CD Location, n (%)	
Terminal ileum	0/34 (0)
Colon	4/34 (11.8)
Ileocolonic	29/34 (85.3)
Upper GI	1/34 (2.9)
Perianal disease, n (%)	9 (8.8)
CD phenotype, n (%)	
Inflammatory	16/36 (44.4)
Stricturing	14/36 (38.9)
Penetrating	6/36 (16.7)
UC extension, n (%)	
Proctitis	3/64 (4.7)
Left sided colitis	2/64 (3.1)
Pancolitis	59/64 (92.2)
Bowel resection before VDZ, n (%)	45 (55.6)
History of liver transplant, n (%)	33 (30.6)
VDZ outcomes	N = (108)
Median duration of therapy, months (range)	17.5 (2.0-66.0)
Drug dose frequency, n (%)	

Table 1. (*continued*)

Patient demographics	N = 108
Every 8 weeks	79 (73.1)
Every 6 weeks	7 (6.5)
Every 4 weeks	22 (20.4)
VDZ discontinued indefinitely, n (%)	46 (43.0)
Clinical response at 6 months, n (%)	74/102 (72.6)
Clinical response at 1 year, n (%)	64/83 (77.1)
Endoscopic response at 6 months, n (%)	24/51 (47.1)
Endoscopic healing at 6 months, n (%)	8/55 (14.5)
Endoscopic response at 1 year, n (%)	25/43 (58.1)
Endoscopic healing at 1 year, n (%)	12/46 (26.1)
Radiologic response at 6 months, n (%)	11/34 (32.4)
Radiologic healing at 6 months, n (%)	6/37 (16.2)
Radiologic response at 1 year, n (%)	7/18 (38.9)
Radiologic healing at 1 year, n (%)	4/22 (18.2)
Histologic healing at 6 months, n (%)	3/45 (6.7)
Histologic healing at 1 year, n (%)	9/48 (18.8)
Colectomy on VDZ, n (%)	16/108 (15.0)

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A Meta-Analysis of Colonic Involvement in Ulcerative Colitis Among Asian Countries

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Introduction: Ulcerative Colitis (UC) is a chronic inflammatory non-fatal disease usually found in the large intestine and rectum. Over the years the incidence and prevalence of UC has been lower in Asia when compared to the Western World. However, new studies in Asia are showing an increase in the incidence of UC over the past 2 decades. Here we aim to assess the incidence and manifestations of Ulcerative Colitis across multiple countries in Asia.
Methods: An extensive meta-analysis on Ulcerative colitis patients was performed comparing articles from different parts of Asia, and R software was used 2 compile the data. In addition, the patient's data regarding colonic involvement was reviewed. Patient's data was then matched using propensity score matching in the R software.
Results: Incidence of rectal involvement was high among the Chinese and Indian population (30.30% China vs. 5.56% Hong Kong vs. 2.53% Singapore vs.19.80% Korea vs. 31.82% India, p:0.023 95%CI). Left-sided ulcerated colitis was predominant among the Chinese population (38.28% China vs. 5.26% Hong Kong vs. 0.93% Singapore vs. 13.80% Korea vs. 10.82% India, p:0.033 95%CI). Extensive colonic manifestation involving most of the colon was seen in the Indian population compared to other nationalities (10.01% China vs. 9.09% Hong Kong vs. 7.27 % Singapore vs. 20.80% Korea vs. 44.10 % India, $p < 0.01$ 95%CI).
Conclusion: There are a multitude of factors that may be contributing to the rise of both the incidence and prevalence of UC in Asian Countries. These factors include westernization of lifestyle, changes in diet, increased use of modern medicine from the traditional homeopathic modalities, and/or industrialization of society. As you can see from our study, the incidence, prevalence and manifestations even within Asia vary among the countries. A study conducted in 2013 which compared Singapore, Malaysia, and India found that Indians not only had a higher prevalence of UC but also had more extensive disease. In our study, we found that rectal involvement was highest among Chinese and Indians. However, extensive colonic involvement was seen at a significantly higher rate in Indians compared to the rest.

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Identification and Characterization of a Single-Center Cohort of Patients With Refractory or Relapsing Immune Checkpoint Inhibitor-Induced Colitis

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Introduction: Immune checkpoint inhibitors (ICIs) fight cancer by turning the immune system against malignant cells, which predisposes patients to autoimmune toxicities. ICI-induced colitis is one of the most frequent toxicities encountered. We sought to characterize and describe the disease and treatment course of those individuals who suffer prolonged courses of ICI-induced colitis to identify risk factors for refractory colitis.
Methods: Retrospective chart review was performed across s multi-site health system using a unified data platform. Cases were identified for medication administrations of FDA-approved immune checkpoint inhibitors prior to December 1st 2021. Charts were abstracted to determine the duration of ICI therapy, symptoms, clinical evaluation, and treatment course. Cases were subdivided into four groups: those with a single episode of colitis responsive to colitis-directed treatment after maximum of 60 days without relapse or recurrence, cases with recurrent or worsening symptoms despite treatment, cases with a second episode despite initial resolution, and cases who never managed to achieve symptom resolution at time of last follow up.
Results: We identified 148 cases of ICI-colitis with median follow up of 1.08 (IQR 0.46-1.99) years detailed in Table. There were no significant differences between gender breakdown, smoking status, or history of prior chemotherapy across the subgroups. Patients had an average of 0.723 (SD 0.879) additional ICI-induced toxicities. In individuals with a single episode of colitis, median symptom duration was 59 (IQR 24-102) days vs 137 days ($p< 0.001$) in refractory colitis. Cases of refractory colitis were more often treated with systemic steroid treatment (96.2%, $p=0.029$) and biologics (34%, $p< 0.001$). 19 cases experienced a second episode of colitis, despite 1 on biologic therapy and 7 on corticosteroids during ICI therapy. 47.4% of cases were hospitalized and 2 (10.5%) experiencing mortality during their second flare. 15 cases never experienced symptom control. 80% of these cases were hospitalized, and 21.4% experienced mortality from colitis despite ICI therapy being held in all instances.
Conclusion: We present a large case series of patients with ICI-colitis and identify a subset of patients with refractory or relapsing symptoms. Predictive factors for these patients remain to be determined, and management relies on a combination of enteral and systemic steroids and occasionally biologic therapy.

Table 1. **Demographics and disease and treatment course of cases developing immune checkpoint inhibitor colitis, broken down by four different clinical disease patterns**

	Single Episode of Colitis, Treated N=61	Single Episode of Colitis, Refractory Symptoms N=53	Second Episode of Colitis N=19	Single Episode of Colitis, persistent symptoms N=15	All Cases n=148
Female	28 (45.9%)	30 (56.6%)	6 (31.6%)	9 (60.0%)	73 (49.3%)
Age at first ICI median, IQR, years (median, IQR)	66.6 (57.4, 72.5)	67.9 (58.4, 71.7)	66.1 (56.8, 71.3)	70.3 (68.3, 75.7)	67.4 (57.6, 72.4)

Table 1. (*continued*)

	Single Episode of Colitis, Treated N=61	Single Episode of Colitis, Refractory Symptoms N=53	Second Episode of Colitis N=19	Single Episode of Colitis, persistent symptoms N=15	All Cases n=148
Deceased	25 (41.0%)	15 (28.3%)	7 (36.8%)	13 (86.7%)**	60 (40.5%)
Median Follow Up After Symptom Onset, years (median, IQR)	1.04 (0.46-1.86)	1.44 (0.66-2.04)	1.93 (0.75-2.69)	0.22 (0.12-0.45)	1.08 (0.46-1.99)
Malignancy					
Melanoma	27 (44.3%)	25 (47.2%)	9 (47.4%)	3 (20.0%)	64 (43.2%)
Lung Cancer-NSCLC	12 (19.7%)	13 (24.5%)	3 (15.8%)	3 (20.0%)	31 (20.9%)
Renal cell carcinoma	5 (8.2%)	4 (7.5%)	2 (13.3%)	2 (13.3%)	16 (10.8%)
Other	17 (28%)	11 (21%)	3 (16%)	7 (47%)	37 (25%)
Causative Immune Checkpoint inhibitor					
Pembrolizumab	27 (44.3%)	21 (39.6%)	8 (42.1%)	7 (46.7%)	63 (42.6%)
Nivolumab	5 (8.2%)	11 (20.8%)	5 (26.3%)	0 (0.0%)	21 (14.2%)
Ipilimumab + Nivolumab	24 (39.3%)	14 (26.4%)	3 (15.8%)	6 (40.0%)	47 (31.8%)
Other	5 (8.2%)	7 (13.2%)	3 (15.8%)	2 (13.3%)	17(11.5 %)
ICI doses prior to colitis, n (median, IQR)	6 (2, 11)	6 (3, 10.250)	6 (2.500, 11)	6 (3.500, 8)	6 (3, 10.500)
Additional ICI toxicities, n (mean, SD)	0.62 (0.82)	0.77 (0.89)	0.79 (0.92)	0.87 (1.06)	0.72 (0.88)
Time from first ICI to colitis, days (median, IQR)	85 (40, 211)	127 (61, 243)	84 (43, 420)	92 (42, 125.5)	93.5 (42, 244.3)
Duration of symptoms, days (median, IQR)	59 (24, 102)	137 (74, 225) ***	65 (24.5, 102.5)	80 (43, 163)	80.500 (30.8, 146.5)
CTCAE grade					
1	7 (11.5%)	6 (11.3%)	2 (10.5%)	1 (6.7%)	16 (10.8%)
2	21 (34.4%)	20 (37.7%)	7 (36.8%)	2 (13.3%)	50 (33.8%)
3	22 (36.1%)	17 (32.1%)	9 (47.4%)	6 (40.0%)	54 (36.5%)
4	11 (18.0%)	10 (18.9%)	1 (5.3%)	4 (26.7%)	26 (17.6%)
5	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (13.3%)	2 (1.4%)
Hospitalized for event	30 (49.2%)	26 (49.1%)	9 (47.4%)	12 (80.0%) *	77 (52.0%)
Mortality from Event	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (21.4%) ***	3 (2.0%)
ICI therapy held due to colitis	54 (88.5%)	46 (86.8%)	18 (94.7%)	11 (73.3%)	129 (87.2%)
Switched to another ICI	10 (16.4%)	8 (15.1%)	3 (15.8%)	1 (6.7%)	22 (14.9%)
Colonoscopy obtained	13 (21.3%)	24 (45.3%) **	3 (15.8%)	4 (26.7%)	44 (29.7%)
Sigmoidoscopy obtained	15 (24.6%)	17 (32.1%)	8 (42.1%)	4 (26.7%)	44 (29.7%)
Endoscopy confirmed colitis†	25 (89.3%)	40 (97.6%)	11 (100.0%)	7 (87.5%)	83 (94.3%)
Fecal calprotectin elevated††	6 (75.0%)	16 (88.9%)	2 (66.7%)	3 (75.0%)	27 (81.8%)
Treatment with systemic steroids	51 (83.6%)	51 (96.2%)*	16 (84.2%)	15 (100.0%)	133 (89.9%)
Duration of systemic steroid treatment, days (median, IQR)	67 (60, 111)	178.5 (93.8, 277.3)	148 (60, 238)	59 (22, 96) *	100 (61.8, 218.3)
Treatment with budesonide n, %	24 (39.3%)	30 (56.6%)	11 (57.9%)	6 (40.0%)	71 (48.0%)
Duration of budesonide treatment days (median, IQR)	138 (70.5, 244.3)	165.5 (107, 317.8)	137 (119.5, 281)	131 (104.5, 157.5)	155 (97, 280)
Treatment with biologic	5 (8.2%)	18 (34.0%) ***	2 (10.5%)	2 (13.3%)	27 (18.2%)

Those with a single episode of colitis responsive to initial treatment without relapse, those with a single episode of colitis with symptoms refractory to either initial treatment or recurrent after treatment taper, those with a second episode of colitis, and those with symptoms that never resolved at the time of last follow-up. Values listed as n, % unless otherwise specified. * P<0.05, ** p< 0.01, *** p<0.001 † Percentage pertains to % of cases in which endoscopy was pursued †† Percentage obtained to % of cases in which calprotectin was obtained

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High Rates of Chronic Constipation in Inflammatory Bowel Disease Patients

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Introduction: Even though patients with inflammatory bowel diseases (IBD) typically present with diarrhea and can be an important consideration in clinical scoring systems, some may develop constipation. The prevalence and clinical scenarios in which constipation is seen in IBD patients has not been well described. We aim to evaluate the prevalence of constipation in IBD patients and assess the phenotypic characteristics of those IBD patients that develop it.

Methods: Using a retrospective case-control study, we enrolled 500 patients with a confirmed diagnosis of IBD seen in an outpatient tertiary referral IBD clinic. IBD outpatients seen at a tertiary referral clinic least once in 12 months were included. We excluded patients with a known partial or complete bowel obstruction, those with short gut, colectomies, and an ostomy. Data collected included disease phenotype, clinical and endoscopic disease activity, medication, and previous surgeries. The primary outcome was constipation, defined as subjectively as less than three bowel movements per week and the secondary outcome was constipation per the more stringent Rome IV criteria.

Results: Out of a total of 500 patients included, 50.1% met the subjective criteria for constipation and 27.4% met Rome IV criteria. Female patients were found to significantly ($p< 0.001$) have at least 2 Rome IV constipation modalities compared to men. Constipated patients significantly ($p< 0.001$) used more laxatives and fiber. There was a significant ($p< 0.001$) increase in constipation among patients who were using opioids, as they also scored in at least two Rome IV criteria. No significant association was seen between constipation and active IBD activity, disease characteristics, prior surgeries, or medication use (Table).

Conclusion: We found that a large proportion of IBD patients deal with constipation regardless of disease activity, prior surgery, or medication use. Rates of IBD patient constipation is tied to female sex and opioid use which is also seen in the general population. The prevalence does not seem driven by inflammation or post-surgical anatomy, so other etiologies such as slow transit and pelvic dysfunction should be considered. Identifying underlying etiologies of constipation is important as they can guide appropriate therapy.

Table 1. **Comparing patient Demographics & Diagnoses, UC Phenotype, CD Phenotype, Baseline Evaluation, Clinical Disease Activity, Labs, Medication by Subjective Constipation and Rome IV Definition**

	Constipation (subjective assessment)				Constipation by at least 2 modalities (Rome IV Criteria)			
	N (N=249)	Y (N=251)	Total (N=500)	p value	No (N=363)	Yes (N=137)	Total (N=500)	p value
Age				< 0.001				0.023
Mean (sd)	40.669 (16.431)	45.618 (16.089)	43.158 (16.432)		42.127 (16.517)	45.883 (15.943)	43.158 (16.432)	
Range	20.000 - 85.000	20.000 - 88.000	20.000 - 88.000		20.000 - 88.000	21.000 - 87.000	20.000 - 88.000	
Gender				< 0.001				< 0.001
F	96 (38.6%)	171 (68.1%)	267 (53.4%)		172 (47.4%)	95 (69.3%)	267 (53.4%)	
M	153 (61.4%)	80 (31.9%)	233 (46.6%)		191 (52.6%)	42 (30.7%)	233 (46.6%)	
Race				0.035				0.04
White	231 (92.8%)	214 (85.6%)	445 (89.2%)		331 (91.2%)	114 (83.8%)	445 (89.2%)	
Black	14 (5.6%)	27 (10.8%)	41 (8.2%)		23 (6.3%)	18 (13.2%)	41 (8.2%)	
Others	4 (1.6%)	9 (3.6%)	13 (2.6%)		9 (2.5%)	4 (2.9%)	13 (2.6%)	
Alcohol Use				0.41				0.679
N	86 (34.5%)	78 (31.1%)	164 (32.8%)		121 (33.3%)	43 (31.4%)	164 (32.8%)	
Y	163 (65.5%)	173 (68.9%)	336 (67.2%)		242 (66.7%)	94 (68.6%)	336 (67.2%)	
Active Smoker				0.619				0.573
N	165 (66.3%)	161 (64.1%)	326 (65.2%)		234 (64.5%)	92 (67.2%)	326 (65.2%)	
Y	84 (33.7%)	90 (35.9%)	174 (34.8%)		129 (35.5%)	45 (32.8%)	174 (34.8%)	
Diagnosis				0.09				0.443
CD	161 (64.7%)	180 (71.7%)	341 (68.2%)		244 (67.2%)	97 (70.8%)	341 (68.2%)	
UC	88 (35.3%)	71 (28.3%)	159 (31.8%)		119 (32.8%)	40 (29.2%)	159 (31.8%)	
H.O. bowel resection				0.412				0.52
N	161 (64.7%)	171 (68.1%)	332 (66.4%)		238 (65.6%)	94 (68.6%)	332 (66.4%)	
Y	88 (35.3%)	80 (31.9%)	168 (33.6%)		125 (34.4%)	43 (31.4%)	168 (33.6%)	
Years with IBD				0.554				0.227
Mean (sd)	14.073 (11.068)	13.534 (9.118)	13.802 (10.128)		14.142 (10.914)	12.912 (7.668)	13.802 (10.128)	
Range	1.000 - 61.000	1.000 - 52.000	1.000 - 61.000		1.000 - 61.000	1.000 - 41.000	1.000 - 61.000	
	3	2	5		5	0	5	
Any Neurologic Disorder				0.002				0.083
N	229 (92.0%)	208 (82.9%)	437 (87.4%)		323 (89.0%)	114 (83.2%)	437 (87.4%)	
Y	20 (8.0%)	43 (17.1%)	63 (12.6%)		40 (11.0%)	23 (16.8%)	63 (12.6%)	
Diabetes				0.479				0.185
N	235 (94.4%)	233 (92.8%)	468 (93.6%)		343 (94.5%)	125 (91.2%)	468 (93.6%)	
Y	14 (5.6%)	18 (7.2%)	32 (6.4%)		20 (5.5%)	12 (8.8%)	32 (6.4%)	
Chronic kidney disease (CKD)				0.568				0.262
N	244 (98.0%)	244 (97.2%)	488 (97.6%)		356 (98.1%)	132 (96.4%)	488 (97.6%)	
Y	5 (2.0%)	7 (2.8%)	12 (2.4%)		7 (1.9%)	5 (3.6%)	12 (2.4%)	
Left Sided UC				0.399				0.617
N	73 (84.9%)	55 (79.7%)	128 (82.6%)		96 (83.5%)	32 (80.0%)	128 (82.6%)	
Y	13 (15.1%)	14 (20.3%)	27 (17.4%)		19 (16.5%)	8 (20.0%)	27 (17.4%)	
Pancolonic UC				0.302				0.711
N	21 (24.4%)	22 (31.9%)	43 (27.7%)		31 (27.0%)	12 (30.0%)	43 (27.7%)	

Table 1. (*continued*)

	Constipation (subjective assessment)				Constipation by at least 2 modalities (Rome IV Criteria)			
	N (N=249)	Y (N=251)	Total (N=500)	p value	No (N=363)	Yes (N=137)	Total (N=500)	p value
Y	65 (75.6%)	47 (68.1%)	112 (72.3%)		84 (73.0%)	28 (70.0%)	112 (72.3%)	
Proctitis				0.051				0.406
N	83 (96.5%)	61 (88.4%)	144 (92.9%)		108 (93.9%)	36 (90.0%)	144 (92.9%)	
Y	3 (3.5%)	8 (11.6%)	11 (7.1%)		7 (6.1%)	4 (10.0%)	11 (7.1%)	
Ileal CD				0.714				0.227
N	125 (80.1%)	143 (81.7%)	268 (81.0%)		188 (79.3%)	80 (85.1%)	268 (81.0%)	
Y	31 (19.9%)	32 (18.3%)	63 (19.0%)		49 (20.7%)	14 (14.9%)	63 (19.0%)	
Ileo-Colonic CD				0.258				0.471
N	63 (40.4%)	61 (34.9%)	124 (37.5%)		93 (39.2%)	31 (33.0%)	124 (37.5%)	
PERINANAL	0 (0.0%)	2 (1.1%)	2 (0.6%)		1 (0.4%)	1 (1.1%)	2 (0.6%)	
Y	93 (59.6%)	112 (64.0%)	205 (61.9%)		143 (60.3%)	62 (66.0%)	205 (61.9%)	
Colonic CD				0.616				0.85
N	125 (80.1%)	144 (82.3%)	269 (81.3%)		192 (81.0%)	77 (81.9%)	269 (81.3%)	
Y	31 (19.9%)	31 (17.7%)	62 (18.7%)		45 (19.0%)	17 (18.1%)	62 (18.7%)	
Inflammatory				0.898				0.58
N	84 (53.8%)	93 (53.1%)	177 (53.5%)		129 (54.4%)	48 (51.1%)	177 (53.5%)	
Y	72 (46.2%)	82 (46.9%)	154 (46.5%)		108 (45.6%)	46 (48.9%)	154 (46.5%)	
Stricturing				0.732				0.732
N	100 (64.1%)	109 (62.3%)	209 (63.1%)		151 (63.7%)	58 (61.7%)	209 (63.1%)	
Y	56 (35.9%)	66 (37.7%)	122 (36.9%)		86 (36.3%)	36 (38.3%)	122 (36.9%)	
Fistulizing/Penetrating				0.651				0.466
N	85 (54.5%)	91 (52.0%)	176 (53.2%)		129 (54.4%)	47 (50.0%)	176 (53.2%)	
Y	71 (45.5%)	84 (48.0%)	155 (46.8%)		108 (45.6%)	47 (50.0%)	155 (46.8%)	
SES (CD)				0.157				0.033
Mean (sd)	4.041 (6.313)	3.044 (5.417)	3.477 (5.833)		3.964 (6.392)	2.345 (4.073)	3.477 (5.833)	
Range	0.000 - 37.000	0.000 - 35.000	0.000 - 37.000		0.000 - 37.000	0.000 - 17.000	0.000 - 37.000	
Nmiss	128	93	221		168	53	221	
Mayo (UC)				0.071				0.185
Mean (sd)	2.942 (3.807)	1.885 (2.602)	2.446 (3.327)		2.677 (3.535)	1.794 (2.591)	2.446 (3.327)	
Range	0.000 - 11.000	0.000 - 9.000	0.000 - 11.000		0.000 - 11.000	0.000 - 9.000	0.000 - 11.000	
Nmiss	180	190	370		267	103	370	
Only rectum inflamed				0.049				0.034
N	237 (100.0%)	242 (98.4%)	479 (99.2%)		348 (99.7%)	131 (97.8%)	479 (99.2%)	
Y	0 (0.0%)	4 (1.6%)	4 (0.8%)		1 (0.3%)	3 (2.2%)	4 (0.8%)	
Any inflammation				0.161				0.79
N	130 (55.1%)	151 (61.4%)	281 (58.3%)		201 (57.9%)	80 (59.3%)	281 (58.3%)	
Y	106 (44.9%)	95 (38.6%)	201 (41.7%)		146 (42.1%)	55 (40.7%)	201 (41.7%)	
Base Severity				0.295				0.928
Mild	58 (24.7%)	56 (22.8%)	114 (23.7%)		82 (23.7%)	32 (23.7%)	114 (23.7%)	
Mod/Mod-Sev	48 (20.4%)	39 (15.9%)	87 (18.1%)		64 (18.5%)	23 (17.0%)	87 (18.1%)	
NAD	129 (54.9%)	151 (61.4%)	280 (58.2%)		200 (57.8%)	80 (59.3%)	280 (58.2%)	

Table 1. (*continued*)

	Constipation (subjective assessment)				Constipation by at least 2 modalities (Rome IV Criteria)			
	N (N=249)	Y (N=251)	Total (N=500)	p value	No (N=363)	Yes (N=137)	Total (N=500)	p value
Biologics				0.312				0.217
N	3 (1.2%)	1 (0.4%)	4 (0.8%)		4 (1.1%)	0 (0.0%)	4 (0.8%)	
Y	246 (98.8%)	250 (99.6%)	496 (99.2%)		359 (98.9%)	137 (100.0%)	496 (99.2%)	
Immunomodulators				0.114				0.014
N	91 (36.5%)	75 (29.9%)	166 (33.2%)		132 (36.4%)	34 (24.8%)	166 (33.2%)	
Y	158 (63.5%)	176 (70.1%)	334 (66.8%)		231 (63.6%)	103 (75.2%)	334 (66.8%)	
Mesalamine				0.418				0.444
N	73 (29.3%)	82 (32.7%)	155 (31.0%)		109 (30.0%)	46 (33.6%)	155 (31.0%)	
Y	176 (70.7%)	169 (67.3%)	345 (69.0%)		254 (70.0%)	91 (66.4%)	345 (69.0%)	
Systemic Corticosteroids				0.977				0.959
N	24 (9.6%)	24 (9.6%)	48 (9.6%)		35 (9.6%)	13 (9.5%)	48 (9.6%)	
Y	225 (90.4%)	227 (90.4%)	452 (90.4%)		328 (90.4%)	124 (90.5%)	452 (90.4%)	
Topical Mesalamine				0.315				0.539
N	248 (99.6%)	251 (100.0%)	499 (99.8%)		362 (99.7%)	137 (100.0%)	499 (99.8%)	
Y	1 (0.4%)	0 (0.0%)	1 (0.2%)		1 (0.3%)	0 (0.0%)	1 (0.2%)	
Topical Corticosteroids				0.598				0.611
N	243 (97.6%)	243 (96.8%)	486 (97.2%)		352 (97.0%)	134 (97.8%)	486 (97.2%)	
Y	6 (2.4%)	8 (3.2%)	14 (2.8%)		11 (3.0%)	3 (2.2%)	14 (2.8%)	
Harvey Bradshaw Index (CD)				0.799				0.482
Mean (sd)	1.731 (2.785)	1.639 (3.106)	1.679 (2.967)		1.762 (3.128)	1.488 (2.567)	1.679 (2.967)	
Range	0.000 - 13.000	0.000 - 21.000	0.000 - 21.000		0.000 - 21.000	0.000 - 13.000	0.000 - 21.000	
Nmiss	130	93	223		170	53	223	
Partial Mayo Score (UC)				0.041				0.196
Mean (sd)	1.986 (2.728)	1.148 (1.750)	1.598 (2.357)		1.755 (2.520)	1.147 (1.760)	1.598 (2.357)	
Range	0.000 - 8.000	0.000 - 6.000	0.000 - 8.000		0.000 - 8.000	0.000 - 6.000	0.000 - 8.000	
Nmiss	178	190	368		265	103	368	
Simple Inflammatory Bowel Disease Score (SIBDQ)				0.146				0.202
Mean (sd)	57.136 (9.877)	52.682 (10.092)	54.909 (10.122)		56.393 (9.523)	52.312 (10.916)	54.909 (10.122)	
Range	33.000 - 68.000	35.000 - 70.000	33.000 - 70.000		33.000 - 68.000	35.000 - 70.000	33.000 - 70.000	
Nmiss	227	229	456		335	121	456	
CRP				0.697				0.339
Mean (sd)	1.178 (3.047)	1.074 (2.578)	1.124 (2.809)		1.205 (2.957)	0.922 (2.402)	1.124 (2.809)	
Range	0.030 - 30.000	0.000 - 25.700	0.000 - 30.000		0.000 - 30.000	0.030 - 25.700	0.000 - 30.000	
Nmiss	39	20	59		49	10	59	
Calprotectin				0.547				0.696
Mean (sd)	1087.625 (1429.730)	786.346 (2008.924)	930.960 (1744.040)		872.946 (1235.648)	1096.077 (2792.809)	930.960 (1744.040)	
Range	30.000 - 5041.000	30.000 - 10000.000	30.000 - 10000.000		30.000 - 5041.000	30.000 - 10000.000	30.000 - 10000.000	
Nmiss	225	225	450		326	124	450	
Hb				0.057				0.2
Mean (sd)	14.241 (6.936)	13.363 (1.445)	13.787 (4.943)		13.973 (5.764)	13.318 (1.468)	13.787 (4.943)	
Range	8.300 - 114.000	9.200 - 17.700	8.300 - 114.000		8.300 - 114.000	9.500 - 17.700	8.300 - 114.000	
Nmiss	27	13	40		34	6	40	

Table 1. (*continued*)

	Constipation (subjective assessment)				Constipation by at least 2 modalities (Rome IV Criteria)			
	N (N=249)	Y (N=251)	Total (N=500)	p value	No (N=363)	Yes (N=137)	Total (N=500)	p value
WBC				0.208				0.935
Mean (sd)	7.472 (2.670)	7.785 (2.654)	7.634 (2.663)		7.628 (2.628)	7.651 (2.760)	7.634 (2.663)	
Range	1.700 - 22.000	3.300 - 25.200	1.700 - 25.200		1.700 - 22.000	3.300 - 25.200	1.700 - 25.200	
Nmiss	27	12	39		34	5	39	
Albumin				0.036				0.092
Mean (sd)	4.316 (0.463)	4.218 (0.518)	4.265 (0.494)		4.290 (0.464)	4.203 (0.559)	4.265 (0.494)	
Range	1.800 - 5.500	0.400 - 5.200	0.400 - 5.500		1.800 - 5.500	0.400 - 5.000	0.400 - 5.500	
Nmiss	33	16	49		42	7	49	
Fiber				< 0.001				< 0.001
N	249 (100.0%)	153 (61.0%)	402 (80.4%)		330 (90.9%)	72 (52.6%)	402 (80.4%)	
Y	0 (0.0%)	98 (39.0%)	98 (19.6%)		33 (9.1%)	65 (47.4%)	98 (19.6%)	
Any constipation medication				< 0.001				< 0.001
N	249 (100.0%)	23 (9.2%)	272 (54.4%)		265 (73.0%)	7 (5.1%)	272 (54.4%)	
Y	0 (0.0%)	228 (90.8%)	228 (45.6%)		98 (27.0%)	130 (94.9%)	228 (45.6%)	
Miralax				< 0.001				< 0.001
N	249 (100.0%)	47 (18.7%)	296 (59.2%)		275 (75.8%)	21 (15.3%)	296 (59.2%)	
Y	0 (0.0%)	204 (81.3%)	204 (40.8%)		88 (24.2%)	116 (84.7%)	204 (40.8%)	
Docusate				< 0.001				< 0.001
N	249 (100.0%)	144 (57.4%)	393 (78.6%)		318 (87.6%)	75 (54.7%)	393 (78.6%)	
Y	0 (0.0%)	107 (42.6%)	107 (21.4%)		45 (12.4%)	62 (45.3%)	107 (21.4%)	
Other				< 0.001				< 0.001
N	249 (100.0%)	110 (43.8%)	359 (71.8%)		305 (84.0%)	54 (39.4%)	359 (71.8%)	
Y	0 (0.0%)	141 (56.2%)	141 (28.2%)		58 (16.0%)	83 (60.6%)	141 (28.2%)	
Opioids				< 0.001				< 0.001
N	39 (15.7%)	16 (6.4%)	55 (11.0%)		51 (14.0%)	4 (2.9%)	55 (11.0%)	
Y	210 (84.3%)	235 (93.6%)	445 (89.0%)		312 (86.0%)	133 (97.1%)	445 (89.0%)	
Anticholinergic				0.185				0.102
N	165 (66.3%)	152 (60.6%)	317 (63.4%)		238 (65.6%)	79 (57.7%)	317 (63.4%)	
Y	84 (33.7%)	99 (39.4%)	183 (36.6%)		125 (34.4%)	58 (42.3%)	183 (36.6%)	
Tricyclic Antidepressants				0.013				0.002
N	229 (92.0%)	213 (84.9%)	442 (88.4%)		331 (91.2%)	111 (81.0%)	442 (88.4%)	
Y	20 (8.0%)	38 (15.1%)	58 (11.6%)		32 (8.8%)	26 (19.0%)	58 (11.6%)	

S959

A Phase 1 Drug Interaction Study Evaluating the Effects of Itraconazole on the Pharmacokinetics, Safety, and Tolerability of Etrasimod in Healthy Volunteers

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Introduction: Etrasimod (ETR), is an investigational, once-daily, oral, selective sphingosine 1-phosphate receptor 1,4,5 modulator in development for the treatment of several immune-mediated inflammatory disorders including ulcerative colitis, Crohn's disease, eosinophilic esophagitis, atopic dermatitis, and alopecia areata. ETR is a substrate of cytochrome P450 (CYP)2C8, CYP2C9, and CYP3A4, and to a minor

extent, CYP2C19 and CYP2J2. ETR was previously evaluated in the presence and absence of fluconazole (moderate inhibitor of CYP2C9 and CYP3A4; strong inhibitor of CYP2C19). ETR exposure measures ($AUC_{0\text{-}168h}$ and $AUC_{0\text{-}\infty}$) increased moderately up to 84% in the presence vs absence of fluconazole, likely due to inhibition of both CYP2C9 and CYP3A4. To determine the relative contribution of CYP3A4, the pharmacokinetics (PK) and safety of ETR in the presence of itraconazole (strong inhibitor of CYP3A4) were evaluated in this open-label Phase 1 study.

Methods: Eighteen healthy male and female volunteers (18-55 years) received a single dose of ETR 1mg on Day 1. Starting on Day 10, participants received 200mg itraconazole solution (10mg/mL) once daily for 13 days and a single dose of ETR 1mg on Day 14. Primary endpoints were plasma C_{max}, $AUC_{0\text{-}last}$, and $AUC_{0\text{-}\infty}$ of ETR in the presence and absence of itraconazole. Log-transformed primary PK parameters for ETR were compared using analysis of variance with treatment as fixed effect and participant as random effect.

Results: The presence of itraconazole had little impact on single-dose peak exposure (C_{max}) of ETR, but mildly increased total exposure measures ($AUC_{0\text{-}last}$ and $AUC_{0\text{-}\infty}$) of ETR by up to 32% (Table). These changes were not considered clinically relevant. Geometric mean $t_{1/2}$ of ETR also mildly increased from 37 to 44 hours in the presence of itraconazole. All treatments were generally well tolerated. All treatment-emergent adverse events were mild. No abnormalities in laboratory parameters, vital signs, or 12-lead electrocardiogram assessments were noted.

Conclusion: The results of this study demonstrate that CYP3A4 is one of several CYP isoforms, along with CYP2C8 and CYP2C9, primarily involved in the disposition of ETR. The involvement of multiple CYP isoforms reduces the likelihood of ETR having a clinically relevant drug interaction, particularly in cases where only a single CYP isoform is strongly or moderately inhibited/induced by a coadministered drug.

Table 1. Statistical Comparison of Etrasimod Plasma Exposure Measures in the Presence and Absence of Itraconazole

Analyte	C_{max} (ng/mL) GLSMR (90% CI)	$AUC_{0\text{-}last}$ (ng*h/mL) GLSMR (90% CI)	$AUC_{0\text{-}\infty}$ (ng*h/mL) GLSMR (90% CI)
[Etrasimod + Itraconazole] / [Etrasimod]			
Etrasimod	1.06 (1.02–1.11)	1.31 (1.26–1.37)	1.32 (1.27–1.38)

AUC_{0-∞}, area under the plasma concentration-time curve from time 0 to infinity; AUC_{0-last}, AUC from time 0 to last quantifiable concentration; CI, confidence interval; C_{max}, maximum plasma drug concentration; GLSMR, geometric least squares mean ratio.

S960

High Degree of Variability in Timeline of Indwelling Seton Removal in Perianal Fistulizing Crohn's Disease

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Introduction: Crohn's Disease (CD) is often complicated by perianal fistulizing disease. Surgical management includes seton placement to promote drainage, treat and prevent abscess formation, and healing. No consensus exists on timing of seton removal or medical therapy. The aim of this study was to determine the variability in the treatment timeline for indwelling perianal setons and their removal in perianal fistulizing Crohn's disease.

Methods: A retrospective review of patients at a tertiary care center from June 2008-May 2021. Patient criteria included luminal diagnosis of CD, diagnosis of perianal fistula, and perianal procedure (n=103). Patients were excluded if lacking luminal Crohn's disease (n=10), did not undergo seton placement (n=14), had less than one year of follow up (n=14), or had rectovaginal fistula or J pouch (n=2). Sixty-one (61) patients were then assessed for presence of one or multiple setons, and the timeline for presence of seton at 6 months, one year, and greater than 1 year. We utilized logistic regression modeling to assess associations between timeline of indwelling seton and medical therapy.

Results: Of 61 patients, the presence of 1 seton (51%) vs multiple setons (49%) was equal. No difference was found in the timeline of seton removal between patients with 1 or multiple setons. Fourteen patients (22.22%) had indwelling setons removed by 6 months, 16 patients (25.39%) had indwelling setons removed by 1 year, and 38 patients (62.3%) had indwelling setons for greater than 1 year. For patients who were on biologics at the time of perianal fistula diagnosis, 8 (28.57%) had seton removal at 6 months, 9 (32.14%) had seton removal at 1 year, and 11 patients (39.28%) had setons in place for longer than 1 year (Figure). The proportion of patients to have seton removal within 1 year was higher if they were on biologics at the time of diagnosis of perianal fistula compared to patients without biologics. No statistically significant associations were found between timeline of indwelling seton and medication exposure.

Conclusion: Our patient cohort displays the significant heterogeneity in the timeline patients experience with indwelling setons. We were unable to identify any significant association between medication strategies and the variable timeline for indwelling setons. This variability of seton timeline should prompt formulation of clinical pathways to coordinate multidisciplinary care and define specific treatment strategies to improve the likelihood for seton removal.

		Seton removal at 6 months	Seton removal at 1 year	Seton left in longer
		Yes - 14 (22.22%)	Yes - 16 (25.39%)	Yes - 38 (60.31%)
IBD Medication at the time of diagnosis of anal fistula	No Medications	5 (16.67%)	7 (23.33%)	18 (60%)
	Biologics	8 (28.57%)	9 (32.14%)	11 (39.28%)
	Immunomodulators	0	0	6 (100%)

[0960] **Figure 1.** Seton Removal and IBD Medication Therapy at Time of Anal Fistula Diagnosis

S961

CRP/Albumin Ratio as an Indicator for Clinical Flare in IBD Patients With Smoking Status

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Introduction: Previous studies have shown that smoking increases risk of flare in Crohn's patients, but has no effect on risk of flare in Ulcerative Colitis (UC) patients. However most studies have utilized extensive subjective measurements such as Crohn's Disease Activity Index (CDAI) to assess IBD flare. No study has utilized C-Reactive Protein (CRP)/albumin ratio to monitor flare in IBD patients with smoking status.

Methods: Retrospective analysis was performed on a group of adults (>18 years old) with an ICD-9/10 code diagnosis of Crohn's or UC disease during their index hospitalization for suspected IBD flare to a tertiary care center between January 1st 2013 to June 1st 2017. Clinical flare was defined as whether or not they were symptomatic at the time of the encounter based on clinical notes. Inflammation status was assessed using CRP /albumin ratio obtained at that time. Smoking status was defined as ever or never smoker.

Results: Out of 1101 IBD patients, 418 patients had a documented smoking status and a calculable CRP/Albumin ratio; 168 (40.2%) were ever smokers and 250 (59.8%) were never smokers. Ever-smoker IBD and Crohn's patients who had a flare, had statistically significant higher mean CRP/Albumin ratio than those who did not, (p=0.027 and p=0.012, respectively). Never-smoker IBD and Crohn's patients who had a flare, had statistically significant higher mean CRP/Albumin ratio than those who did not, (p=0.0001 and p=0.0001, respectively). Ever-smoker UC patients who had a flare, had a lower mean CRP/Albumin ratio, than those who did not (p=0.571). Conversely, never-smoker UC patients who had a flare, had a higher mean CRP/Albumin ratio, than those who did not (p=0.300) (Table).

Conclusion: Our findings are consistent with previous studies that smoking is associated with an increased risk of flare in Crohn's patients and has no significant effect on risk of flare in UC patients. Similar to Crohn's patients, we found that smoking was associated with a higher mean CRP/Albumin ratio in all IBD patients. We utilized a new indicator for measuring flare which is CRP/albumin ratio. This ratio can be easily obtained by clinicians to assess clinical flare in IBD patients with smoking status.

Table 1. Clinical Flare in IBD Patients who are Ever vs. Never Smokers using CRP/Albumin Ratio as an Indicator

	All IBD N (mean)	P-value	Crohn's N (mean)	P-value	Ulcerative Colitis N(mean)	P-value	Clinical Flare
Ever Smokers	89 (15.0)	0.027	82 (15.2)	0.012	7 (13.7)	0.571	Clinical Flare
	126 (8.9)		119 (8.2)		7 (20.6)		No Clinical Flare
Never Smokers	136 (16.9)	0.0001	98 (17.8)	0.0001	36 (15.5)	0.300	Clinical Flare
	181 (7.7)		147(7.1)		33 (10.4)		No Clinical Flare

Number of patients (N) and their affiliated mean CRP/Albumin ratios (mean) and p-values are reported above.

S962

Presence of Risk Factors Associated With Colectomy Among Patients With Colectomy in the Tofacitinib OCTAVE Ulcerative Colitis Clinical Program

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Introduction: Tofacitinib is an oral small molecule JAK inhibitor for the treatment of UC. Avoidance of colectomy remains an important goal of UC therapy and there are known factors associated with increased colectomy risk.[1]

Methods: This post hoc analysis assessed baseline characteristics and presence of risk factors for colectomy among patients (pts) who underwent colectomy in the tofacitinib OCTAVE clinical program (NCT01465763;NCT01458951;NCT01458574;NCT01470612). Incidence rates (IRs; unique pts with events/100 pt-years [PY] of exposure) were assessed in 3 cohorts: Induction (placebo [PBO] or tofacitinib 10 mg twice daily [BID]), Maintenance (PBO, tofacitinib 5 or 10 mg BID), and Overall (pts who received ≥ 1 dose of tofacitinib 5 or 10 mg BID in Phase 3 or open-label, long-term extension [OLE] studies). Risk factors assessed were: age < 40 years at diagnosis, extensive colitis, severe endoscopic disease (Mayo endoscopic subscore of 3), hospitalization for colitis within 12 months, C-reactive protein > 3 mg/L, and serum albumin < 3.5 g/dL.[1]

Results: In total, 14 pts underwent colectomy: 3/1,139 in the induction studies (tofacitinib 10 mg BID: n = 2; PBO: n = 1), 3/593 in the maintenance study (PBO: n = 3), and 8/944 in the OLE study (tofacitinib 10 mg BID: n = 8; per protocol pts were not in remission at baseline). IRs per 100 PY (95% CI; exposure) were: Induction: PBO, 2.47 (0.06, 13.74; 40.55 PY) and tofacitinib 10 mg BID, 1.26 (0.15, 4.55; 158.72 PY); Maintenance: PBO, 2.90 (0.60, 8.47; 103.48 PY), tofacitinib 5 mg BID, 0.00 (0.00, 2.48; 148.77 PY), and tofacitinib 10 mg BID, 0.00 (0.00, 2.35; 157.31 PY); Overall: tofacitinib all, 0.34 (0.16, 0.63; 2915.95 PY). Baseline characteristics of pts who underwent colectomy, including treatment duration and risk factors for colectomy, are summarized (Table); all had ≥ 1 risk factor and prior tumor necrosis factor inhibitor (TNFi) exposure.

Conclusion: Colectomies were infrequent in the OCTAVE clinical program; all were in pts with prior TNFi exposure and most pts had multiple risk factors. For induction responders, the fact that colectomies only occurred in pts who received PBO and not tofacitinib in the maintenance study supports the importance of continued active therapy in pts with moderate to severe UC. This analysis was limited by the low number of colectomies and potential underestimation due to case report form identification without adjudication.

Table 1. Baseline Demographics and Clinical Characteristics of Patients Who Underwent Colectomy in the OCTAVE Clinical Program

Treatment group at time of colectomy	Sex, Age at diagnosis (years), Disease duration (years)[a]	Disease extent	MES at baseline	Hospitalization for colitis within 12 months	Baseline CRP (mg/L)	Baseline albumin (g/dL)	Days of treatment prior to colectomy	Total Mayo score at last visit prior to colectomy	Risk factors present[b,c]
OCTAVE Induction 1&2									
Tofacitinib 10 mg BID	Male, 26, ≥ 6	Left-sided colitis	3	No	53.53	4.0	21	11	3
Tofacitinib 10 mg BID	Male, 41, < 6	Left-sided colitis	3	No	1.90	4.3	38	11	1
Placebo	Female, 14, < 6	Extensive/ pancolitis	2	No	4.36	3.6	58	9	3
OCTAVE Sustain									
Placebo	Female, 52, ≥ 6	Extensive/ pancolitis	3	Yes	4.65	4.0	126	6	4
Placebo	Female, 67, < 6	Left-sided colitis	3	Yes	19.59	3.9	143	10	3
Placebo	Female, 23, ≥ 6	Left-sided colitis	3	No	1.08	4.5	63	4	2
OCTAVE Open									
Tofacitinib 10 mg BID	Female, 35, ≥ 6	Extensive/ pancolitis	3	No	13.42	4.1	62	12	4
Tofacitinib 10 mg BID	Female, 22, ≥ 6	Extensive/ pancolitis	3	No	4.02	4.2	132	6	4
Tofacitinib 10 mg BID	Male, 44, < 6	Proctosigmoiditis	3	No	4.50	3.7	44	11	2
Tofacitinib 10 mg BID	Female, 20, ≥ 6	Extensive/ pancolitis	3	No	36.80	4.2	92	4	4

Table 1. (*continued*)

Treatment group at time of colectomy	Sex, Age at diagnosis (years), Disease duration (years)[a]	Disease extent	MES at baseline	Hospitalization for colitis within 12 months	Baseline CRP (mg/L)	Baseline albumin (g/dL)	Days of treatment prior to colectomy	Total Mayo score at last visit prior to colectomy	Risk factors present[b,c]
Tofacitinib 10 mg BID	Male, 31, < 6	Extensive/ pancolitis	3	Yes	1.71	4.3	56	8	4
Tofacitinib 10 mg BID	Male, 45, ≥ 6	Extensive/ pancolitis	3	Yes	40.53	3.2	375	11	5
Tofacitinib 10 mg BID	Female, 31, ≥ 6	Left-sided colitis	3	Yes	4.34	4.1	47	11	4
Tofacitinib 10 mg BID	Female, 29, < 6	Extensive/ pancolitis	3	Yes	7.50	4.0	174	6	5

Patients with UC in OCTAVE Induction 1&2 (8 weeks [NCT01465763; NCT01458951]), OCTAVE Sustain (52 weeks [NCT01458574]) and OCTAVE Open (OLE study [NCT01470612]) were evaluated. All patients had prior TNFi exposure
[a]Data were taken from baseline of the respective studies in which the colectomy occurred
[b]Data were taken from baseline of OCTAVE Induction 1&2
[c]Risk factors for colectomy included: age < 40 years at diagnosis, extensive colitis, severe endoscopic disease (MES of 3), hospitalization for colitis within 12 months, CRP > 3 mg/L, and serum albumin < 3.5 g/dL
BID, twice daily; CRP, C-reactive protein; MES, Mayo endoscopic subscore; OLE, open-label, long-term extension; TNFi, tumor necrosis factor inhibitor; UC, ulcerative colitis

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S963

Characteristics, Treatment and Outcome of Patients With Previously Diagnosed Autoimmune Disease After Immune Checkpoint Inhibitor Exposure

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Introduction: Immune checkpoint inhibitors (ICI) can predispose to immune related adverse events (irAEs) and autoimmune disease (AD) flare-ups. irAE characteristics among patients with previously diagnosed AD have not been well studied. We aim to describe the clinical course, complications, treatment, and outcomes of patients with AD on ICIs.
Methods: This is a retrospective chart review of adult cancer patients at the MD Anderson Cancer Center diagnosed with AD (based on ICD code) prior to the first dose of ICI treatment between 01/01/2010 and 04/30/2021. Patients' clinical course, treatment and outcomes related to both AD and irAE were collected and analyzed.
Results: A total of 197 patients were included in this study. A majority of our sample were female (55.4%) most frequently having melanoma (28.4%) and receiving PD-1/L1 inhibitors (83.7%). Forty-two patients (21.3%) developed a new irAE after starting immunotherapy, while 29 had an AD flare (14.7%). Patients with inflammatory bowel disease (IBD) had the highest rate of AD flare (31.7%), while patients with hypothyroidism had the highest incidence of new irAEs at 39.2%. Patients with IBD had more severe adverse events however with a median CTCAE grade of 3.5. In our cohort, all patients that were diagnosed with a new irAE were treated with immunosuppressive therapy. AD flares were managed similarly. With regards to irAE manifestations, colitis was the most common presentation in our cohort; at least 24 patients (23.2%) excluding those patients with a diagnosis of (IBD and microscopic colitis) had this type of complication. This was followed by pneumonitis in 9 patients (4.5%) and transaminitis in 7 patients (3.5%).
Conclusion: Studies on the correlation between prior AD and immunotherapy are still lacking. Our findings suggest that patients with GI and rheumatologic ADs had higher incidence of AD flare up than new irAE development, while patients with thyroid and neurologic ADs appeared to have higher incidence of new irAEs compared to AD flare. Patients with prior AD experiencing a flare or a new irAE after immunotherapy tend to require more aggressive immunosuppressive treatment for symptom control. Thorough evaluation of baseline disease status, the appropriate medical management prior to ICI, and early recognition of inflammatory exacerbation could be key factors to ensure long-term success with treating and improving outcomes of these patients.

Table 1. **Summary of irAE characteristics per Autoimmune Disease system, N=197**

Autoimmune Disease per system	Active AD status before ICI, N (%)	On medical Rx before ICI, N (%)	Flare up after ICI, N (%)	Type of ICI	Peak CTCAE grade of flare up (median, IQR)	Required IMS for flare up, N (% of those that had flare)	New irAE in different organ from AD, N (%)	Peak CTCAE of irAE (median, IQR)	IMS required for irAE, N (% of those that had irAE)
Hematological									
ITP (N=2)	0 (0)	0 (0)	0 (0)	PD1/L1=2 (100)	N/A	N/A	0 (0)	N/A	N/A
Endocrine									
Hypothyroidism (N=51)	0 (0)	51 (100)	2 (3.9)	Combined= 9 (17.6); PD1/L1=42 (82.3)	Grade 2 in 1 (50)	0 (0)	20 (39.2)	2(1-3)	20 (100)
Neurological									
MS-TM-GBS (N=27)	27 (100)	3 (11.1)	2 (7.4)	Combined= 1 (3.8); PD1/L1= 21 (77.7); CTLA-4=5 (18.5)	N/A	2 (100)	5 (18.5)	1(1-1.5)	5 (100)
Rheumatological									
Rheumatoid A (N=58)	0 (0)	58 (100)	15 (25.8)	Combined= 1 (1.7); PD1/L1= 57 (98.2);	N/A	15 (100)	12 (20.6)	2.5(2-3)	9 (75)
Gastroenterological (N=30)	0 (0)	30 (100)	10 (33.3)	Combined=3 (10); PD1/L1=27 (90)	N/A	10 (100)	5 (16.6)	N/A	5 (100)
Microscopic Colitis (N=10)	0 (0)	3(30)	8 (80)	PD1/L1=10 (100)	N/A	8 (100)	1 (10)	N/A	1 (100)
Celiac Disease (N=1)	0 (0)	0 (0)	0 (0)	PD1/L1=1 (100)	N/A	N/A	0 (0)	N/A	N/A
IBD (N=19)	1 (5.2)	10 (52.6)	6 (31.7)	Combined=3 (15.7); PD1/L1=16 (84.2)	N/A	6 (100)	4 (21)	3.5(3-4)	4 (100)

Footnote: IMS=immunosuppressant. ITP=Immune Thrombocytopenic Purpura. MS=Multiple Sclerosis. TM= Transverse Myelitis. GBS=Guillain Barre Syndrome. IBD=Inflammatory Bowel Disease.
*all the patients had baseline low activity at the time of ICI initiation. Flare up occurred when the symptoms progressed from baseline activity.

S964

Impact of Biologics Therapy on the Prevalence of Erectile Dysfunction Among Patients With Inflammatory Bowel Disease: A Nationwide Population-Based Study

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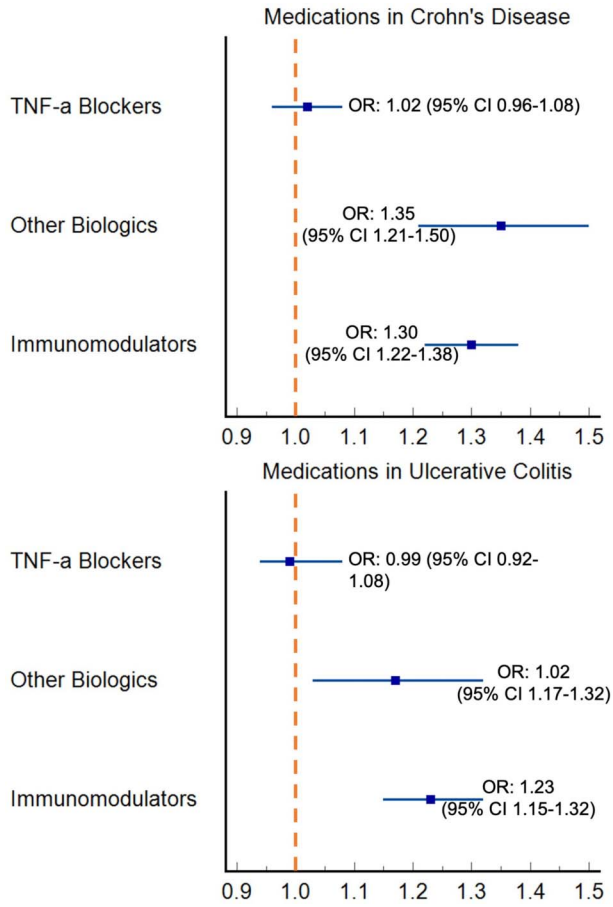
Introduction: Erectile dysfunction (ED) is a well-established comorbidity of Inflammatory bowel disease (IBD). However, the connection between the two diseases remains unclear. Previous studies have suggested that chronic inflammation resulting in endothelial dysfunction maybe a contributing factor in the pathology of ED. Biologics have been shown to decrease inflammation among IBD patients. Therefore, we sought to investigate the prevalence of ED among individuals with IBD in a large national claims database and assess if biologics therapy may affect the risk of ED in patients with IBD.
Methods: We used the IBM Explorys clinical database which includes over 74 million de-identified unique patients across 300 hospitals in the United States. Patients were identified using SNOMED and ICD codes. We identified all male patients (age >18 years) who were diagnosed with either Crohn's disease (CD) or ulcerative colitis (UC). We investigated the prevalence of ED in IBD patients compared to patients with no IBD. Also, we compared the prevalence of ED between IBD patients with and without biologics therapy. Odds ratios with 95% confidence intervals were calculated to evaluate the risk of ED.
Results: In this male-only cohort, we identified 100,020 patients with CD and 86,340 patients with UC, of whom 7,060 (7.06%) and 7,430 (8.61%) developed ED, respectively compared to 2.89% in individuals without IBD, p< 0.0001 to all. Both CD [OR: 2.54; 95% CI: 2.48-2.61] and UC [OR: 3.16; 95%CI: 3.08-3.23] patients had a significant higher risk of ED compared to patients without IBD. 20,040 (20.0%) patients with CD and 10,980 (12.7%) patients with UC received biologics therapy. The biologics-treated cohort was not significantly associated with a lower risk of developing ED in both CD [OR: 1.02; 95%CI: 0.96-1.09] and UC [OR: 0.99; 95%CI: 0.92-1.07], respectively (Figure).
Conclusion: In this large retrospective study, we found that the prevalence of ED in patients with IBD was significantly higher than the general population. Overall, treatment with biologics was not associated with a significant decline in ED among IBD patients. These findings suggest that ED among patients with IBD may be driven by a different pathology besides chronic inflammation. Further studies are needed to determine the etiology behind ED among IBD patients.



[0964] **Figure 1.** Logistic Regression of Erectile Dysfunction Risk in IBD, IBD; inflammatory bowel disease. Immunomodulators included Azathioprine, Methotrexate and Mercaptopurine. Other biologics included Natalizumab, Ustekinumab and Vedolizumab. TNF-a Blockers; tumor necrosis factor-alpha blocker.

Table 1. Demographics of patients with IBD and ED

Variable	Patients with ED				No ED	
	With IBD		Without IBD			
N	12,780	%	903,480	%	30532290	%
Age 18 - 64	5,760	45.1%	434,850	48.1%	21,038,710	68.9%
Age >65	7,070	55.3%	472,220	52.3%	9,126,770	29.9%
Caucasian	10,640	83.3%	663,680	73.5%	16,599,190	54.4%
Smoker	2,810	22.0%	151,670	16.8%	1,791,870	5.9%
Alcohol abuse	980	7.7%	52,640	5.8%	674,360	2.2%
T2DM	4,150	32.5%	270,010	29.9%	2,627,640	8.6%

Table 1. (*continued*)

Variable	Patients with ED					
	With IBD		Without IBD		No ED	
N	12,780	%	903,480	%	30532290	%
Hyperlipidemia	9,350	73.2%	639,150	70.7%	5,077,870	16.6%
HTN	4,330	33.9%	255,660	28.3%	1,366,290	4.5%
CAD	3,780	29.6%	196,350	21.7%	2,027,450	6.6%
Depressive disorder	4,590	35.9%	213,260	23.6%	2,010,190	6.6%
Colectomy	3,190	25.0%	89,640	9.9%	488,020	1.6%
Small intestinal repair/resection	1,880	14.7%	16,560	1.8%	473,250	1.6%
PDE5 inhibitor use	4,620	36.2%	337,800	37.4%	342,420	1.1%

IBD; inflammatory bowel disease, ED; erectile dysfunction, T2DM; type 2 diabetes mellitus, HTN; essential hypertension, CAD; coronary artery disease, PDE5; phosphodiesterase type 5 inhibitor.

S965

Acute Severe Ulcerative Colitis Is Associated With an Increased Risk of Acute Pouchitis

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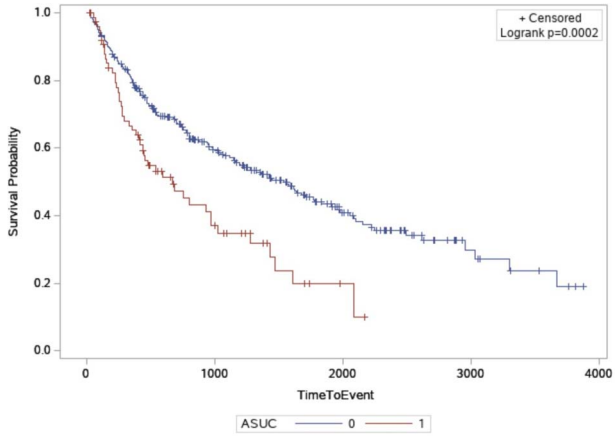
Introduction: Pouchitis occurs in up to 80% of patients with ulcerative colitis (UC) after total proctocolectomy (TPC) with ileal pouch anal anastomosis (IPAA). The pathogenesis of pouchitis is thought to involve a complex interaction between the microbiome and mucosal immune system, and increasing data suggest a robust immune system may be associated with an increased risk of pouchitis. We aimed to test this hypothesis by performing a retrospective cohort analyses comparing the incidence of acute pouchitis in patients admitted with acute severe ulcerative colitis (ASUC) at the time of colectomy to patients admitted without ASUC.
Methods: This was a retrospective cohort analysis of all patients with UC or IBD unclassified complicated by medically refractory disease or dysplasia who underwent TPC with IPAA at Mount Sinai Hospital between 2008 and 2017 and at least one subsequent pouchoscopy. ASUC was defined by the Truelove and Witts criteria. Acute pouchitis was defined according to the Pouchitis Disease Activity Index. Univariable cox regression was used to assess unadjusted relationships between hypothesized risk factors and acute pouchitis. Multivariable cox regression for the primary outcome of acute pouchitis was performed a priori with selection of the following clinically relevant variables: age, sex, ASUC admission, number of pre-colectomy biologics, and disease extent.
Results: A total of 416 patients met inclusion criteria. The median age at colectomy was 35.4 [IQR 26.1-49.0] years and 224 (53.8%) patients were male. Biologics were used in 292 (70.2%) patients pre-colectomy, and disease extent was reported as extensive in 327 (78.6%). Elective colectomy was performed in 251 (60.3%) patients. Of the 165 (39.7%) patients who underwent urgent colectomy, 77 (46.7%) were admitted with ASUC. (Figure) Acute pouchitis occurred in 228 (54.8%) patients a median of 1.3 [IQR 0.6-3.1] years after the final surgical stage. On multivariable analysis, older age at colectomy (HR 0.98 95% CI (0.97-0.99)) was significantly associated with a decreased probability of acute pouchitis, while ASUC (HR 1.53 95% CI (1.06-2.22)) and a greater number of biologics pre-colectomy (HR 1.30 95% CI (1.05-1.62)) were associated with an increased probability of acute pouchitis. Time to pouchitis was significantly less in patients admitted with ASUC compared to those not, p=0.002.
Conclusion: ASUC at the time of colectomy was associated with an increased probability of acute pouchitis.



[0965] **Figure 1.** Kaplan-Meier estimates of developing acute pouchitis in patients with vs. without acute severe ulcerative colitis

S966

The Epidemiology of Inflammatory Bowel Disease in Eosinophilic Esophagitis in the United States: Results From a Population-Based National Study

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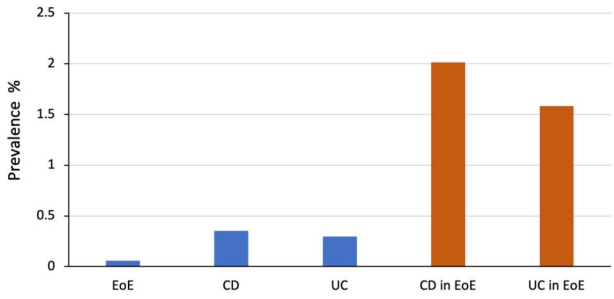
Introduction: Eosinophilic esophagitis (EoE) and inflammatory bowel disease (IBD) are immune-mediated diseases with potential pathogenesis and epidemiology intersections. We aim to investigate the relationship between EoE and IBD and describe the epidemiology of individuals with EoE with co-existent IBD in the United States (US).
Methods: We queried a multi-instituitional database (Explorys Inc, Cleveland, OH), an aggregate of electronic health record data from 26 major integrated US healthcare systems. We identified an aggregated patient cohort of eligible patients with EoE and concomitant IBD based on Systematized Nomenclature of Medicine - Clinical Terms (SNOMED-CT) from 1999 to present. we calculated the prevalence of IBD in EoE and among different patient group.
Results: Of the 70,383,890 individuals in the database, we identified 41,670 patients with EoE, 249,420 patients with Crohn's disease (CD), and 208,990 patients with Ulcerative colitis (UC). Patients with EoE had concomitant CD, with an overall prevalence of CD in EoE being 2%, with an odds ratio (OR) of 5.80 (95% CI: 5.42-6.21, $p < 0.0001$), compared to individuals without EoE. Patients with EoE also had concomitant UC, with an overall prevalence of UC in EoE being 1.6%, with an odds ratio (OR) of 5.42 (95% CI: 5.02-5.85, $p < 0.0001$), compared to individuals without EoE (Figure). The prevalence of CD in EoE was higher in males vs. females (58.3% vs. 41.7%), Caucasians vs. non-Caucasians (78.6% vs. 21.4%), and in patients 18-65-year-old vs. >65 years old (88.1% vs. 11.9%), $P < 0.0001$ to all. Similarly, the

prevalence of UC in EoE was higher in males vs. females (55% v.s 45%), Caucasians v.s non-Caucasians (80.3% v.s 19.,7%), and in patients 18-65 years old vs. >65 years old (80.3% vs. 19.7%), P < 0.0001 to all (Table).

Conclusion: In one of the first large population-based studies on the epidemiology of IBD and EoE, we found that the prevalence of CD in EoE is 2% and UC in EoE 1.6% which emphasizes the importance of awareness among the gastroenterologists regarding the coexistence of EoE and IBD. Further studies are needed to understand the underlying mechanism of the association between these conditions.



[0966] **Figure 1.** Prevalence of EoE, CD, UC, CD in EoE and UC in EoE overall. EoE; Eosinophilic Esophagitis, CD; crohn's disease, UC; ulcerative colitis.

Table 1. Gender, Race and Age based sub-groups distribution of CD in EoE and UC in EoE

CD in EoE			
Variables	**OR**	**95% CI**	***P* Value**
Age (>65 vs 18-65)	54.76	40.76-73.57	< 0.0001
Sex (Male vs Female)	1.96	1.61-2.38	< 0.0001
Race (Caucasian vs non-Caucasian)	13.44	10.65-16.97	< 0.0001
UC in EoE			
Variables	OR	95% CI	*P* Value
Age (>65 vs 18-65)	16.62	12.67-21.80	< 0.0001
Sex (Male vs Female)	1.36	1.09-1.69	< 0.0001
Race (Caucasian vs non-Caucasian)	16.62	12.67-21.80	< 0.0001

Univariate analysis used to calculate OR. OR; odds ratio. CI; confidence interval, CD; Crohn's disease, UC; ulcerative colitis, EoE; eosinophilic esophagitis.

S967

Inflammatory Bowel Diseases Results in Worse Hospital Outcomes in Patients Admitted for Acute Diverticulitis: A Study of the National Inpatient Sample

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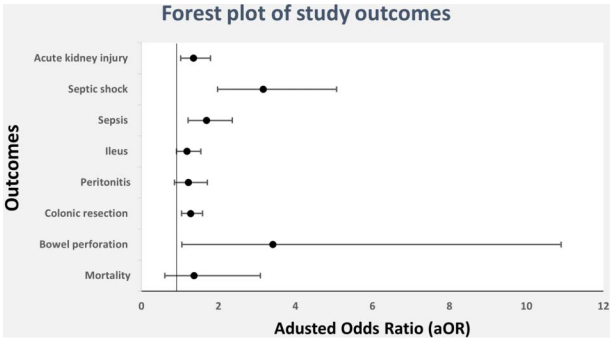
Introduction: The association between Acute Diverticulitis (AD) and Inflammatory Bowel Diseases (IBD) is extremely rare in literature and not well studied as a result of the scarcity of reports and overlapping clinical and radiological features. In this study, we aim to investigate the clinical impact of IBD on the outcomes of patients admitted for AD.

Methods: The National Inpatient Sample Database of the years 2016 to 2019 was analyzed, and patients who were hospitalized for AD, with or without a secondary diagnosis of IBD (Crohn's Disease and ulcerative colitis) were identified using the 10th Revision of International Classification of Diseases codes. Univariates and Multivariate logistic regression analysis was performed to determine risk difference in mortality and AD-related complications. Data was considered statistically significant with p-value < 0.05.

Results: A total of 313,054 adults AD hospitalizations were identified, among which 3090 (1%) had a history of IBD. AD patients baseline characteristics and comorbidities are listed in Table stratified by IBD diagnosis. IBD patients found to have 27% increase in risk of AD than IBD-free patients (adjusted odds ratio (aOR) 1.27, p< 0.001) with no difference in risk of mortality between the two groups (aOR 1.37, p=0.437). AD/IBD patients had significant increased risk of bowel perforation (aOR 3.41, p=0.04), sepsis (aOR 1.69, p=0.002), septic shock (aOR 3.16, p< 0.001), acute kidney injury (aOR 1.35, p=0.036) and undergoing colonic resection (aOR 1.28, p=0.018) than AD/non-IBD group. In term of healthcare resources utilization, IBD patients had a prolonged length of stay (adjusted mean difference (aMD) 1.39 days, p< 0.001) and increased cost of care (aMD 16993$, p< 0.001) when hospitalized for AD when compared to non-IBD patients. (Figure)

Conclusion: This is the first descriptive analysis to demonstrate the effect of IBD on outcomes of patients with AD. IBD patients are at higher risk of developing AD, and IBD patients admitted for AD were found to have had higher risk of bowel perforation, sepsis, septic shock, acute kidney injury and undergoing colonic resection with significant increase in healthcare resources utilization. As such association is unique in clinical practice, misdiagnosis can occur and therefore physicians should keep high index of suspicion in this challenging scenario to primarily avoid catastrophic outcomes and decrease resources utilization.



[0967] **Figure 1.** Forest plot of outcomes in patient hospitalized for AD with history of IBD, compared to non-IBD patients. (AD=Acute Diverticulitis, IBD=Inflammatory Bowel Diseases)

Table 1. Baseline characteristics of AD patients stratified based on diagnosis status of IBD

VARIABLE	ALL AD %, NO.	WITHOUT IBD %, NO.	WITH IBD %, NO.	P value
	(100.0) 313054	99.0 (309964)	1.00 (3090)	
Patient's characteristics				
Age, mean years	58.4	58.4	60.3	0.001
Female	49.8 (155901)	49.8 (154362)	54.3 (1678)	0.028
Racial distribution				< 0.001
White	76.3 (238860)	76.3 (236503)	83.4 (2577)	
Black	8.62 (26985)	8.65 (26812)	6.46 (200)	
Hispanic	11.0 (34436)	11.1 (34406)	6.29 (194)	
Others	2.29 (7169)	2.29 (7098)	2.65 (82)	
Insurance type				0.002
Medicaid	36.5 (114265)	36.5 (113137)	43.4 (1341)	
Medicare	11.2 (35062)	11.2 (34716)	9.43 (291)	
Private	45.7 (143066)	45.7 (141654)	42.7 (1319)	
Uninsured	6.49 (20317)	6.52 (20210)	4.38 (135)	
Charlson comorbidity index score				0.082
1	22.1 (69185)	22.1 (68502)	21.5 (664)	
2	9.20 (28801)	9.18 (28455)	11.6 (358)	
≥3	9.86 (30867)	9.85 (30531)	11.3 (349)	
Median annual income, us$				0.281
1–43,999	23.9 (74820)	23.9 (74081)	23.1 (714)	
44,000–55,999	26.1(81707)	26.2 (81211)	23.4 (723)	
56,000–73,999	26.3 (82333)	26.3 (81521)	27.0 (834)	
≥74,000	23.5 (73568)	23.4 (72532)	26.2 (810)	
Hospital characteristics				
Hospital region				0.079
Northeast	20.8 (65115)	20.8 (64473)	24.7 (763)	
Midwest	22.6 (70750)	22.6 (70052)	23.4 (723)	
South	38.0 (118961)	38.0 (117786)	35.2 (1088)	
West	18.4 (57602)	18.4 (57033)	16.5 (510)	
Hospital bed size				0.338
Small	23.3 (72942)	23.3 (72222)	22.6 (698)	
Medium	31.0 (97047)	31.0 (96089)	28.8 (890)	
Large	45.6 (142753)	45.6 (141344)	48.5 (1499)	
Hospital location				
Rural location	9.76 (30554)	9.78 (30314)	8.09 (250)	0.023
Urban location	25.0 (78264)	25.0 (77491)	21.3 (658)	
Teaching hospital	65.2 (204111)	65.1 (201787)	70.5 (2178)	
Comorbidities				
Hypertension	41.8 (130857)	41.8 (129565)	40.6 (1255)	0.534
Diabetes mellitus	13.9 (43515)	14.0 (43395)	11.3 (349)	0.055
Smoking history	40.0 (125222)	39.9 (123676)	42.7 (1319)	0.171
Hyperlipidemia	29.5 (92351)	29.5 (91439)	30.4 (939)	0.617
Obesity	19.5 (61046)	19.5 (60443)	16.0 (494)	0.030

Table 1. (*continued*)

VARIABLE	ALL AD %, NO.	WITHOUT IBD %, NO.	WITH IBD %, NO.	P value
Chronic kidney disease	6.45 (20192)	6.44 (19962)	8.41 (260)	0.045
Coronary artery disease	10.2 (31932)	10.2 (31616)	11.4 (352)	0.284
Peripheral vascular disease	1.07 (3350)	1.06 (3286)	2.27 (70)	0.003
Congestive heart failure	5.01 (15684)	4.99 (15467)	7.44 (230)	0.005
Chronic obstructive lung disease	8.68 (27173)	8.66 (26843)	11.0 (340)	0.039
Chronic liver disease	4.97 (15559)	4.97 (15405)	5.02 (155)	0.961
Constipation	8.46 (26484)	8.46 (26223)	8.74 (270)	0.800

AD=Acute Diverticulitis, IBD=Inflammatory Bowel Disease.

S968

Attitudes and Adherence to Inflammatory Bowel Disease (IBD) Medications in a Racially and Ethnically Diverse Population

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Introduction: Racial and ethnic differences in attitudes towards IBD medications, adherence and persistence is not well studied. Studies in other chronic diseases suggest lower levels of trust and adherence to medication in people of color. This survey evaluated attitudes toward IBD medications and self-reported adherence of a diverse patient population in a large US health system.
Methods: A survey was created with input from a racially and ethnically diverse panel of patients with IBD. Following institutional review board (IRB) approval, the survey was sent electronically once to adult patients with IBD treated in the health system from Aug 2019 through Dec 2021. Surveys were anonymous. Data collected included demographics, access to care via the Consumer Assessment of Healthcare Providers and Systems, and Barriers to Care surveys, the Medication Adherence Rating Scale-4 (MARS-4), and the Beliefs about Medicines Questionnaire. Analyses compared White/Non-Hispanics (W/NH) and Black/Indigenous/People of Color or Hispanics (BIPOC/H) via X^2 and t-tests.
Results: The survey was sent to 1,210 patients once, 171 responded (14%); 103 (60%) W/NH, and 68 BIPOC/H (40%). Demographic information is shown in Table. BIPOC/H patients reported more concerns regarding long term effects of IBD medications than W/NH counterparts (40% vs 27%; p=.02), were more likely to be worried about becoming dependent on IBD medications (35% vs 19%; p=.041) and were more uncertain of the toxicities of IBD medications (32% vs 15%; p=.007). Both BIPOC/H and W/NH patients reported difficulties accessing medications (40% vs 42%; p >.05). There was a trend toward BIPOC/H patients reporting more non-adherence via the MARS-4 (38% vs 26%) (p=.08). BIPOC/H patients also reported a trend towards intentionally missed doses 40% vs 28% of W/NH (p=.09). The same proportion of BIPOC/H and W/NH patients reported declining to start a newly prescribed medication altogether in the last 6 months (8%) and not persisting on a medication (9%).
Conclusion: BIPOC/H patients with IBD report more concerns about long term use and toxicities of IBD medications than W/NHs. Both self-report similar medication access, adherence, and persistence. Future studies are needed to understand the causes of their concerns for long-term use and toxicities, and the potential impact on outcomes.

Table 1. **Demographics**

	W/NH n = 103	BIPOC/H n = 68	p
Age, Mean (SD)	48.7 (14)	44.0 (13.3)	.03
Female gender, n(%) Male gender, n (%)	71 (69) 32 (31)	48 (71) 20 (29)	.87
Highest level of education, n (%)			
High school graduate or less Some college or 2-year degree 4-year college graduate More than 4-year college degree	20 (20) 29 (28) 23 (22) 31 (30)	17 (25) 24 (35) 9 (13) 14 (21)	.11
Marital Status, n (%)			
Single Married/domestic partnership Widowed Separated/divorced	30 (29) 54 (52) 15 (14) 4 (3)	30 (44) 25 (37) 12 (18) 1 (2)	.12
Types of Health Insurance, n (%)			
HMO/PPO/Private Insurance Medicare Medicaid No insurance/self-pay	66 (64) 21 (20) 19 (18) 3 (2.9)	28 (41) 18 (27) 29 (43) 0 (0.0)	.001

S969

Crohn's Disease Patients Treated With Anti-TNFs Have Lower Rates of Interstitial Lung Disease

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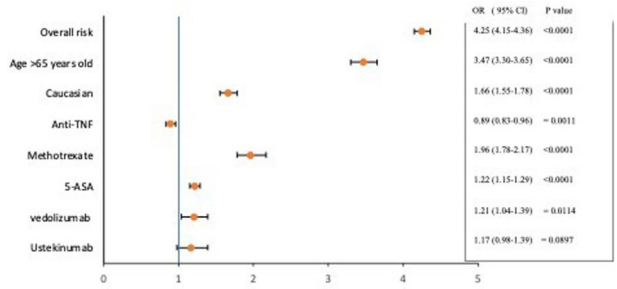
Introduction: Patients with Crohn's Disease (CD) are at increased risk of pulmonary manifestations in particular interstitial lung disease (ILD). Chronic inflammation state might be contributing to this condition. Few studies reported that Anti-Tumor Necrosis Factors (Anti-TNFs) may decrease the pulmonary inflammation in Rheumatoid arthritis patients, but the sample size was very small. Here we aim to investigate the prevalence of ILD in CD patients with and without anti-TNF therapy in large database.
Methods: We queried a multi-institutional database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) with a concomitant diagnosis of CD and ILD. between 1999-2022. The study population was divided into two subgroups based on the presence or absence of medical intervention such as, anti-TNF therapy, Ustekinumab, Vedolizumab, Methotrexate, 5-Aminosalicylates (5-ASA). A univariate binary logistic model was constructed using medical intervention as the dependent variable.

Results: Of the 70, 301,380 individuals in the database from 1999 to present, we identified 249,300 (0.3%) patients with CD, of whom 40,840 (16.4%) patients received anti-TNFs. CD patients were 59.4% females, 76% Caucasian, and 70% in 18-65 years age group. Compared to the general population, patients with CD had higher association risk of ILD diagnosis [OR: 4.25; 95% CI: 4.15-4.36, *P*< 0.0001]. Among CD, predictors of having ILD included being elderly (>65 years old), male, Caucasian, smokers, has history of type 2 diabetes and obesity (P< 0.0001). CD patients treated with anti-TNF had lower rates of ILD [OR: 0.89; 95% CI: 0.83-0.95, P= 0.0011] whereas 5-ASA, methotrexate and vedolizumab had higher rates of ILD [OR: 1.22; 95% CI: 1.15-1.29, P< 0.0001], [OR: 1.96; 95% CI: 1.78-2.17, P< 0.0001] and [OR: 1.21; 95% CI: 1.04-1.39, P= 0.0114], respectively. Ustekinumab had no significant effect [OR: 1.17; 95% CI: 0.98-1.39, P= 0.0897]. (Figure)
Conclusion: In this large study, we found a higher risk association between CD and ILD. We found that CD patients who were treated with anti-TNF were significantly less likely to have ILD when compared to IBD individuals who were never treated with anti-TNF. More clinical studies are needed to investigate if anti-TNF have a lung protective effect related to anti-inflammatory mechanism.



[0969] **Figure 1.** Overall Risk and Predictors of Interstitial lung disease Among Crohn's Disease. Univariate analysis used to calculate OR. OR; odds ratio, CI; confidence interval.

S970

Older Adults Are at Higher Risk for Developing Anti-TNF Antibodies

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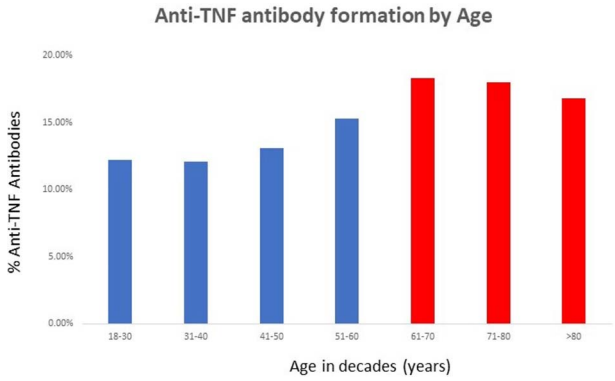
Introduction: As the inflammatory bowel disease (IBD) patient population ages, there will be an increasing number of individuals requiring advanced therapies. Although older age is thought to be associated with immunosenescence, there are data suggesting that older adults may be at higher risk for antibody development as the result of biologic use.
Methods: Using a large commercial laboratory database (Prometheus Laboratories), we extracted infliximab (IFX) dosing as well as antibody to infliximab (ATI) levels for all individuals using this assay from 2015-2021. Our primary outcome was the presence of ATI (titer >3.1 U/mL). Frequencies were recorded as categorical variables with chi-square analysis used, and multivariable logistic regression was employed to assess the impact of IFX dose, age (< 60 years-old v. ≥60 years-old), and IBD subtype on the development of ATI.
Results: Overall, there were 22,197 unique specimens, with 3,028 (13.6%) having ATI. When stratified by age, individuals ≥60 years-old developed ATI 18.1% (473/2,612) of the time as compared to 15.0% (2,555/17,030) for individuals < 60 years of age (p< 0.01, **Figure**). Among all individuals with IFX dose < 10mg q8 weeks, older adults (≥60 years of age) were more likely to develop ATI as compared to younger adults (22.8% vs. 16.2%, respectively, p< 0.01); however, when IFX dose was ≥10mg/kg q8 weeks, age ≥ 60 years-old was no longer significantly associated with the development of ATI (9.9% if < 60 years-old vs. 10.6% if ≥60 years-old) on univariable analysis. Overall, older adults were less likely to receive IFX doses ≥10mg/kg q8 weeks (38.4% in older adults vs. 49.7% in younger adults; p< 0.01). On multivariable analysis, age ≥60 years-old ($_{adj}$OR 1.35, 95%CI 1.20-1.51), IFX dose ≥ 10mg/kg q8 weeks ($_{adj}$OR 0.53, 95%CI 0.49-0.57) and having ulcerative colitis as compared to Crohn's disease ($_{adj}$OR 1.44, 95%CI 1.33-1.57) were independently associated with the development of ATI.
Conclusion: Older adults with IBD develop ATI more frequently than younger adults when adjusting for IFX dose and IBD subtype. However, when IFX dose ≥10mg/kg q8 weeks, ATI was significantly less likely to develop among older adults, and occurred in a similar proportion of younger individuals. Further education is needed, highlighting that older adults with IBD are more likely to develop ATI as compared to younger adults, particularly when using lower doses of IFX, and that higher doses may decrease this likelihood.



[0970] **Figure 1.** Percentage of individuals who develop anti-TNF antibodies by age in decades.

Table 1. Multivariable analysis of factors associated with development of Anti-TNF antibodies

	Odds Ratio [95% CI]
Age ≥60 years	1.35 [1.20 – 1.51]
Infliximab dose ≥10mg/kg q8 weeks	0.53 [0.49 – 0.57]
IBD Subtype Ulcerative Colitis	1.44 [1.33 – 1.57]

S971

The Prevalence of Vasculitis Is Increased in Inflammatory Bowel Disease, but Decreased After Anti-TNF Treatment: A Population-Based Study

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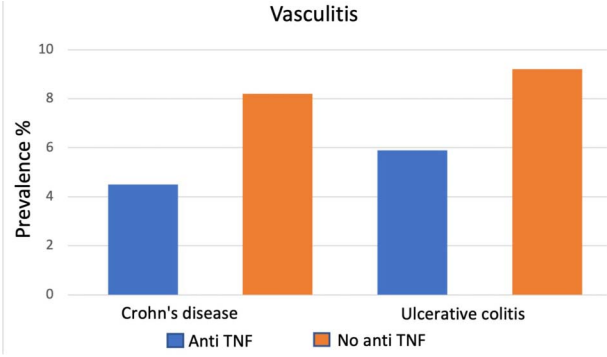
Introduction: Extraintestinal manifestations (EIM) are seen in 6% to 25% of patients with inflammatory bowel disease (IBD). Vasculitis is a rare rheumatologic manifestation of IBD and not properly described in the literature EIMs are more often associated with active colonic inflammation. Our study describes the effect of anti-TNF therapy on the prevalence of vasculitis in IBD patients.
Methods: We used a multi-institutional database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) with a concomitant diagnosis of IBD and vasculitis between 1999 to present. We compared the prevalence of vasculitis in patients with and without IBD. We also assessed the prevalence of vasculitis in IBD patients with and without anti-TNF therapy. (Figure)
Results: Of the 70, 301,380 individuals in the database, we identified 249,300 (0.35%) patients with CD and 208,880 (0.30%) patients with UC, of whom 40,840 (16.4%) and 20,200 (10%) patients received anti-TNFs, respectively. The prevalence of Vasculitis was 7.6% and 8.9% for CD and UC, respectively, compared to 0.9% in individuals without IBD ($p < 0.0001$). The prevalence of vasculitis was significantly lower in anti-TNF treated CD patients (4.5%) compared to those who did not receive anti-TNF therapy (8.2%). Similarly, anti-TNF-treated UC patients were significantly less likely to have vasculitis (5.9%) compared to UC patients who did not receive anti-TNF therapy (9.2%) ($p < 0.0001$). (Table)
Conclusion: In our large cohort of IBD patients, anti-TNF medications appear to be associated with a decreased prevalence of vasculitis. Further studies are needed to ascertain the anti-inflammatory properties of anti-TNF medications on vascular endothelium.



[0971] **Figure 1.** The prevalence of vasculitis in patients with inflammatory bowel disease with and without anti-TNF therapy. Anti-TNF; anti tumor necrosis factor.

Table 1. Anti-TNF characteristics of inflammatory bowel disease individuals with vasculitis

Anti-TNF therapy	Vasculitis	
	Crohn's Disease, 1840 (%)	Ulcerative Colitis, 1190 (%)
Infliximab	650 (35%)	480 (40%)
Adalimumab	660 (36%)	390 (33%)
Certolizumab	60 (3%)	10 (1%)
Golimumab	10 (1%)	20 (2%)

S972

The Real World Global Use of Patient-Reported Outcomes (PROs) for the Care of Patients With IBD

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Introduction: Many patient-reported outcomes (PROs) have been developed for inflammatory bowel disease (IBD), often for research, without clear recommendations for clinical use. PROs differ from physician-reported disease activity indices; they assess patients' perceptions of their symptoms, functional status, mental health, and quality of life, among other areas. The use of PROs and their utility in clinical practice is unknown. Thus, we sought to investigate the current global use and barriers to using PROs in clinical practice for IBD.
Methods: A cross-sectional survey was performed. Members of the International Organization for the Study of Inflammatory Bowel Disease (IOIBD) were invited to participate and invite regional colleagues.
Results: There were 194 respondents, including adult/pediatric gastroenterologists, advanced-practice providers, and colorectal surgeons from 5 continents. The majority (80%) use PROs in clinical practice, 65% found value in routine use, and 50% indicated that PROs influenced patient management. 31 different PROs for IBD were reportedly used in clinical practice. For providers who never use PROs, the most significant barriers were not being familiar with PROs (53%), not knowing how to incorporate the results of PROs into clinical practice (33%), lack of integration into the electronic medical record (EMR) (28%), and time constraints (20%). There was no significant difference in volume of IBD patients seen per week or time spent during a follow up visit between providers who use and do not use PROs. Most participants (91%) agreed that it would be beneficial to have an accepted set of PROs that were consistently used. Suggested PRO tools are listed in Table. The majority (60%) thought that there should be some cultural differences in PROs used globally but that the PROs for IBD should be consistent around the world.
Conclusion: PROs are used frequently in clinical practice with wide variation in which PROs are used and how they influence patient management. Education around how to use and interpret an accepted set of PRO tools that are integrated into the EMR would decrease barriers for use and could allow for global harmonization. Patient perceptions of PROs for IBD is being explored and will further inform this process.

Table 1. **Suggested patient-reported outcome (PRO) tools to be used in clinical practice for the care of patients with IBD**

Patient-Reported Outcome (PRO) Tool	Proportion of Providers Recommending each PRO Tool (%)
PRO2 or PRO3	15.4
Simple clinical colitis activity index (SCCAI)	14.9
Patient-Reported Harvey-Bradshaw Index (patient-reported HBI)	14.6
Survey Index CDAI	10.8
Short IBDQ	10.3
IBD Disk	7.3
IBD Control	4.1
Facit-Fatigue Scale	4.1
Other	3.8
Short Health Scale	3.2
EQ-5D-5L	2.7
General Psychological Well-Being Score (GPP)	2.4
Manitoba Inflammatory Bowel Disease Index	2.4
Work Productivity & Activity Impairment Questionnaire (WPAI)	1.9
PROMIS-10	0.01
ICHOM Standard Set	0.01

* Providers were allowed to respond to more than 1 PRO tool

S973

Impact of Obesity on Outcomes of Patients With Inflammatory Bowel Disease: A National Inpatient Sample Analysis

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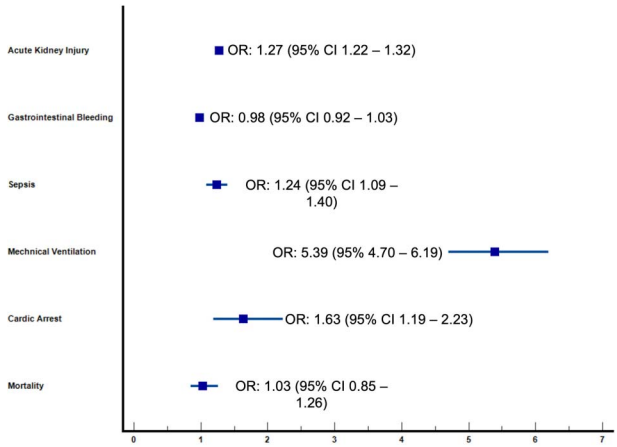
Introduction: Ulcerative colitis (UC) and Crohn's disease (CD) are chronic idiopathic inflammatory bowel diseases (IBD). The underlying disease mechanism had been attributed to genetic susceptibility and environmental factors including dietary factors. Obesity defined as a BMI >30 is a growing co-morbidity that are on the rise and affect over 40% of the adult population in the US. Previous studies suggested obesity leads to worse outcomes in IBD patients through decreased medication absorption and increased post op complications. Using a large inpatient database, we sought to compare the inpatient outcome and complications in IBD patients with and without obesity.
Methods: A retrospective cohort analysis of all adult inpatient hospitalizations for inflammatory bowel disease (IBD) using the National Inpatient Sample (NIS) from 2015 to 2019 was conducted. Our study population included patients admitted with IBD exacerbation. We divided our population into obese and non-obese groups. Baseline demographic characteristics, past medical history and inpatient outcome and complications were compared using Wilcoxon rank-sum test for complex survey samples and chi-squared test with Rao & Scott's second-order correction.
Results: We identified 398,200 patients with IBD. Of which, 36,375 were obese (9.1%) with female predominance at 65%. Patient Characteristics were otherwise similar in race and age. The obese patient group had higher comorbidities (Table). Obese patients with IBD had significantly higher total hospital charges ($48,607 vs $46,661 P< 0.001) and longer length of stay (5.2 vs 5 days P< 0.001) compared to the non-obese group. Obese patients with IBD were also significantly more likely to experience adverse outcomes during their hospitalization including cardiac arrest and mechanical ventilation (Figure).
Conclusion: Obesity is becoming increasingly prevalent in the IBD patient population and correlates with more co-morbidities. Hospitalizations of IBD patients with obesity were significantly longer and more costly. Furthermore, they were significantly more likely to experience serious adverse outcomes during their hospitalization.



[0973] **Figure 1.** Risk analysis of adverse inpatient outcomes of obese IBD patients. OR; Odds ratio, 95% CI; 95% confidence interval.

Table 1. Patient Characteristics

Patients with Inflammatory Bowel Disease			
Characteristic	**Non-Obese, N = 361,825[1]**	**Obese, N = 36,375[1]**	**p-value[2]**
AGE	45 (18)	48 (16)	< 0.001
Gender (Female)	190,035 (53)	23,540 (65)	< 0.001
Race			< 0.001
White	256,955 (73)	25,705 (73)	
Black	48,645 (14)	5,590 (16)	
COPD	44,330 (12)	7,395 (20)	< 0.001
HLD	47,120 (13)	8,450 (23)	< 0.001
CAD	515 (0.1)	95 (0.3)	0.013
T2DM	31,500 (8.7)	8,400 (23)	< 0.001
HTN	98,865 (27)	17,495 (48)	< 0.001
CHF	10,115 (2.8)	2,120 (5.8)	< 0.001
CKD	16,915 (4.7)	2,740 (7.5)	< 0.001
Liver Failure	14,450 (4.0)	2,925 (8.0)	< 0.001
Hypothyroidism	24,915 (6.9)	4,215 (12)	< 0.001
Smoking	133,470 (37)	14,740 (41)	< 0.001
Alcohol abuse	7,000 (1.9)	645 (1.8)	0.35
Drug abuse	21,670 (6.0)	1,890 (5.2)	0.007

COPD; chronic obstructive pulmonary disease, HLD; hyperlipidemia, CAD; coronary artery disease, T2DM; type 2 diabetes mellitus, HTN; hypertension, CHF; congestive heart failure, CKD; chronic kidney disease.
[1]Mean (SD); n (%)
[2]Wilcoxon rank-sum test for complex survey samples; chi-squared test with Rao & Scott's second-order correction

S974

Comparison of Surgical Rates in Biologic Naive Crohn's Disease Patients on Ustekinumab and Vedolizumab

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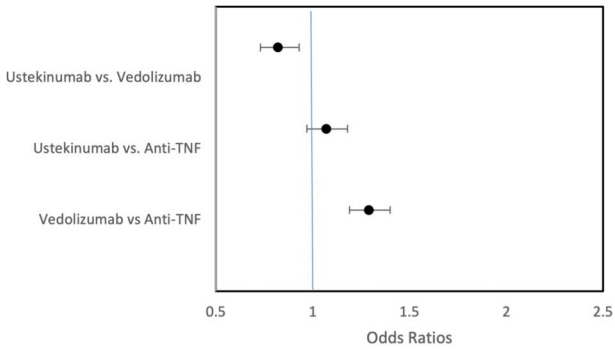
Introduction: Between 25% to 45% of patients with Crohn's Disease (CD) require surgical treatment of their disease between 5 and 10 years of diagnosis. Anti-tumor necrosis factor (anti-TNF) therapy has been associated with lower surgical rates in IBD. However, the rate of surgical intervention in ustekinumab- and vedolizumab-treated biologic naïve CD to date patients is unknown. We aimed to investigate the effect of ustekinumab and vedolizumab on intestinal resection rates in bio-naïve CD patients.
Methods: A commercial database (Explorys Inc, Cleveland, OH) was utilized, which included electronic health record data from 26 major integrated US healthcare systems. We identified bio-naïve CD patients. The primary outcome was to examine the association between anti-tumor necrosis factor (anti-TNF) medications, ustekinumab, and vedolizumab therapy and the rate of bowel resection in bio-naïve CD patients after at least 12 weeks of treatment. Secondary endpoints were factors associated with increased risk of surgical intervention in these bio-naïve CD patients.
Results: The database included over 70 million individuals in which we identified 249,300 (0.35%) adult (>18 years) patients with CD. Among all CD patients, 1.7% received ustekinumab, 2.4% received vedolizumab, and 16% received anti-TNF as first-line biologic therapy. The rate of intestinal resection was lower among ustekinumab-treated compared to vedolizumab-treated bio-naïve CD patients (11.8% vs. 13.9%, p = 0.001). The rate of intestinal resection was higher among vedolizumab-treated compared to anti-TNF-treated bio-naïve CD patients (13.9% vs. 12.5%, p < 0.0001). However, intestinal resection rates did not significantly differ between ustekinumab-treated compared to anti-TNF-treated bio-naïve CD patients (11.8% vs. 12.5%, p = 0.15). Compared to anti-TNF, tobacco smoking, fistulas, and abscesses were more commonly associated with intestinal resection in ustekinumab- and vedolizumab-treated bio-naïve CD patients. Age < 65 years and intestinal fistulas were commonly associated with ustekinumab-treated bio-naïve CD patients compared to vedolizumab. (Figure)
Conclusion: In this large cohort of bio-naïve CD patients, the rate of intestinal resection was lower in ustekinumab-treated and anti-TNF treated patients compared to Vedolizumab after at least 12 weeks of therapy. Further prospective studies are needed to compare the effectiveness and safety of first-line Ustekinumab and Vedolizumab therapy in IBD patients (Table).



[0974] **Figure 1.** Comparison of intestinal resection rates in bio-naive CD patients after at least 12 weeks of ustekinumab, vedolizumab, and anti-TNF.

Table 1. Characteristics of biologic naive CD patients requiring intestinal resection after at least 12 weeks of ustekinumab and vedolizumab

Factors	Ustekinumab N = 510 (%)	Vedolizumab N = 850 (%)	Odds ratio (95% confidence interval), P value
Age			
Adults (18-65y)	460 (90%)	710 (84%)	1.81 (1.28-2.55), 0.0007
Seniors (>65y)	50 (10%)	140 (16%)	0.55 (0.39-0.77), 0.0007
Race			
White	460 (90%)	760 (89%)	1.08 (0.75-1.56), 0.64
Non-white	50(10%)	90 (11%)	0.91 (0.63-1.32), 0.64
Gender			
Female	300 (59%)	460 (54%)	1.21 (0.97-1.51), 0.90
Male	210 (41%)	390 (46%)	0.82 (0.66-1.03), 0.90
Clinical characteristics			
Tobacco user (current and former)	490 (96%)	820 (96%)	0.89 (0.50-1.59), 0.71
Clostridium difficile infection	70 (14%)	150 (18%)	0.74 (0.54-1.01), 0.05
Small bowel obstruction	10 (2%)	30 (4%)	054 (0.26-1.12), 0.10
Fistula of intestine	230 (45%)	330 (38%)	1.29 (1.03-1.61), 0.02
Anorectal fistula	150 (20%)	230 (27%)	1.12 (0.88-1.43), 0.34
Perianal abscess	100 (20%)	140 (16%)	1.23 (0.93-1.64), 0.14
Anorectal abscess	80 (16%)	130 (15%)	1.03 (0.76-1.39), 0.84
Neoplasm of colon	70 (14%)	160 (19%)	0.68 (0.54-0.93), 0.01
Malignant neoplasm of colon	10 (2%)	30 (4%)	0.54 (0.26-1.12), 0.10

S975

COVID-19 Vaccination Patterns and Associated Disparities Among Inflammatory Bowel Disease and Liver Transplant Populations

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Introduction: Liver transplant (LT) recipients may be at higher risk of ICU admission and mechanical ventilation from COVID-19 infection; likewise, patients with inflammatory bowel disease (IBD) on corticosteroids may be at higher risk of severe COVID-19. Vaccine uptake is important to prevent adverse outcomes within these populations. The aim of this study was to evaluate COVID-19 vaccine uptake and associated disparities in patients with IBD and LT recipients.
Methods: We performed a single-center, retrospective study evaluating COVID-19 vaccine uptake among adult patients with IBD and LT recipients seen in clinic between November 2020–April 2021. Vaccination status as of April 2022 was confirmed using the Wisconsin Immunization Registry. ZIP codes were stratified by urban/rural and advantaged/underserved groupings using the Health Innovation Program toolkit. Underrepresented minority (URM) was defined as American Indian/Alaska Native, Black, Native Hawaiian/Pacific Islander race and/or Hispanic ethnicity. The primary outcome was receipt of three mRNA vaccine doses or the viral vector equivalent. A secondary outcome was fourth dose uptake by those eligible.
Results: One thousand twelve patients with IBD and 579 LT recipients were identified (Table). Seven hundred twenty-three (71.4%) patients with IBD and 438 (75.6%) LT recipients received three doses of a COVID-19 mRNA vaccine or the viral vector equivalent (p=0.069). Older individuals were more likely to receive three doses (mean 53.3 (SD 16.8) vs 44.5 (SD 15.8), p< 0.001). URMs were less likely to receive a third dose compared to non-URMs (65.1% vs 73.5%, p=0.059). Rural ZIP code dwellers had statistically significantly lower three-dose uptake than urban counterparts (67.3% vs 75.6%, p=0.001). Those living in underserved ZIP codes showed a trend toward lower three-dose vaccine uptake compared to those residing in advantaged ZIP codes (69.2% vs 76.4%, p=0.098). Fourth dose uptake was higher in LT recipients compared to eligible patients with IBD (28.0% vs 8.7%, p< 0.001).
Conclusion: Receipt of three COVID-19 mRNA vaccine doses or the viral vector equivalent is high among patients with IBD and LT recipients. However, definitive age- and geography-related disparities in vaccine uptake exist, with is a trend toward lower vaccine uptake in URMs. Initiatives to improve equity in COVID-19 vaccination among IBD and LT populations are needed.

Table 1. Demographic data

	Inflammatory Bowel Disease (n=1012)	Liver Transplant (n=579)	p value
Age: mean (SD)	47.2 (16.9%)	57.4 (15.1%)	< 0.001
Gender: n (%)			< 0.001
Male:	535 (34.9%)	354 (61.1%)	
Female:	476 (47.0%)	225 (38.8%)	
Declined to answer:	1 (< 0.1%)	0 (0%)	
Underrepresented minority: n (%)	59 (5.8%)	47 (8.1%)	0.078
Rural ZIP code: n (%)	302 (29.8%)	203 (35%)	0.032
Underserved ZIP code: n (%)	57 (5.6%)	57 (9.8%)	< 0.001
Abbreviations: standard deviation (SD)			

S976

Recent Trends and Mortality Outcomes Among Inflammatory Bowel Disease Patients With and Without Severe Obesity

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Introduction: Inflammatory bowel disease (IBD) comprises crohn's disease and ulcerative colitis. Severe obesity (SO) is defined as body mass index (BMI) >40 kg/m2. Obesity is a known risk factor for developing IBD due to accumulation of intra-abdominal fat, cytokine production, alteration of gut microbiome contributing to mucosal inflammation. Using the National Inpatient Sample (NIS), our study examines trends and mortality outcomes among IBD patients with and without SO.

Methods: The NIS database was used to identify patients (pts) aged ≥18 years with diagnosis of IBD using ICD-10 codes between 2016-2019. Chi square, ANOVA, and multivariate regression were used to compare significant associations with variables and primary outcome of mortality among pts with IBD stratified by BMI >40 (Severe Obesity-SO) and < 40kg/m2 (Non- severe obesity) . Propensity Score Matching was used to assess the effect of SO and history of bariatric surgery on the outcome of death. STATA MP 17 software was used for analysis.

Results: Of the 222,203 pts meeting inclusion criteria, 13,931 (69.61% female; mean age: 54) had SO and 217,633 (55.85% female; mean age: 54) without SO (p=0.23). There was a positive temporal relationship in death rate over time and SO (p=0.00); but a significant negative relationship generally within the IBD population (p=0.02). There was a positive trend in bariatric surgery over time within the general IBD population (p=0.00) and among the IBD-SO subpopulation (p=0.00). Adjusted odds (aOR) of death were 46.73% higher among those with severe obesity compared to other BMI groups (95%CI 1.180-1.865, p=0.00). In propensity score matching analysis, there was a 2.40% higher risk of death in patients with SO compared to non-SO patients (p= 0.03). History of bariatric surgery was associated with 0.70% (p=.026) and 0.85%(p=.01) decreased risk of death in the IBD population and the SO subpopulation compared to those without a history of bariatric surgery, respectively. (Figure)

Conclusion: Among IBD pts, severe obesity was associated with increased mortality compared non severe obesity. Nonetheless, bariatric surgery within the entirety of the population was associated with decreased mortality. There may be some mortality benefit associated with higher weights-possibly related to medication side effects or markers of well controlled disease as weight loss itself was associated with increased odds of mortality. More studies are warranted to analyze efficacy of bariatric surgery in other BMI groups.

Demographics and Matched Study Results

	Severe Obesity			Severe Obesity	
Demographics	0=NO	1=YES		No=0	Yes=1
Frequency	217,633	13,931	**LOCATION & TEACHING STATUS OF HOSPITAL:**		
Mean (SD)			Rural	7.35%**	8.00%**
Age in years at admission (SD)	54.05** (.08027)	54.54**(0.14)	Urban Non-Teaching	19.89%**	21.13%**
Length of stay (SD)	5.165** (0.02)	5.701** (0.061)	Urban Teaching	72.76%**	70.86%**
Total charges (SD)	54495.4** (492.93)	61678.96** (936.39)	Northeast	21.72%**	18.54%**
Factor variable percent			Midwest	24.80%**	29.93%**
Died during hospitalization	1.40%**	1.40%**	South	36.56%**	36.53%**
AGE, RACE, & SEX			West	16.93%**	15.00%**
AGE 18-29	12.95% **	5.54% **	**FACTOR VARIABLE PERCENT**		
AGE 30-54	36.16% **	41.87% **	Congestive Heart Failure	10.83%**	21.99%**
AGE 55-64	16.93% **	23.39% **	Cardiac Arrhythmias	17.60%**	22.19%**
AGE 65-119	33.96% **	29.20% **	Valvular Disease	4.75%	4.92%
WHITE	79.65% **	79.69% **	Pulmonary Circulation Disorders	3.37%**	7.44%**
BLACK	11.04% **	13.05% **	Peripheral Vascular Disorders	5.67%	5.86%
HISPANIC	5.60% **	4.64% **	Other Neurological Disorders	8.97%	9.20%
ASIAN/PACIFIC ISLANDER	1.14% **	0.32% **	Uncomplicated Diabetes	7.96%**	16.90%**
NATIVE AMERICAN	0.35%**	0.61% **	Complicated Diabetes	8.88%**	25.07%**
OTHER RACE	2.22%**	1.68% **	Liver Disease	6.84%**	9.48%**
MALE	44.15%**	30.39% **	Metastatic Cancer	2.30%**	1.41%**
FEMALE	55.85%**	69.61%**	Coagulopathy	6.61%**	7.54%**
PRIMARY EXPECTED PAYER			Weight Loss	13.21%**	
Medicare	43.13%**	46.65%**	Fluid & Electrolyte Disorders	37.39%**	35.48%**
Medicaid	14.58%**	15.04%**	Iron Deficiency Anemia	8.36%	7.98%
Private Insurance	35.91%**	33.52%**	Drug Abuse	7.33%**	5.35%**
Self-pay	3.39%**	2.51%**	Depression	18.79%**	25.73%**
No charge	0.34%**	0.26%**	Long-term Steroid Use	6.17%**	5.69%**
Other	2.64%**	2.03%**	Long-term Remicade	14.74%**	15.72%**
LENGTH OF STAY			Long-term Anticoagulation	7.19%**	10.91%
Less than 30 days	99.05%**	98.83%**	History of Colectomy	16.34%**	14.61%**
30-59 days	0.81%**		**Matched Sample Analysis:**		
60-119 days	0.11%**	0.18%**	**Severe Obesity**	**No=0(CI)**	**Yes=1**
120-364	0.02%**	0.01%**	Frequency	21,350	13,360
TOTAL CHARGE CATEGORICAL			**DIED**	1.231 (.0118 - .0158)**	1.37% (.0108- .0139)**
Less than 50k	68.72%**	64.17%**	Mean (SD)		
50000-99,999	19.53%**	21.79%**	Age in years at admission	55.58834 (0.14)**	54.52013(.14)**
100k-249,999	9.56%**	11.28%**	Length of stay	6.28281 (.05)**	5.71 (.061)**
250k-499,999	1.76%**	2.24%**	Total charges	64792.88 (805.86)**	61970.03 (978.97)**
500k-1m	0.43%**	0.52%**	**Matched Sample Analysis:**		
BED SIZE OF HOSPITAL			**SO with History of Bariatric Surgery**	**No=0(CI)**	**Yes=1(CI)**
Small	19.57%**	20.21%**	Frequency	220,171	2,032
Medium	27.98%**	28.40%**	DIED	1.40%**	0.69%**
Large	52.45%**	51.39%**	Age in years at admission	54.17 (0.08)**	53.39 (0.30)**
LOCATION & TEACHING STATUS OF HOSPITAL:			Length of stay	5.20 (0.02)**	4.87 (.12)**
Rural	7.35%**	8.00%**	Total charges	55050.96 (487.44)**	54250.14 (1670.12)**
Urban Nonteaching	19.89%**	21.13%**	**TABLE LEGEND:**		
Urban Teaching	72.76%**	70.86%**	****: P less than or equal to .05**		

[0976] **Figure 1.** Demographics and matched study results

S977

Ectopic Pregnancy in Women With IBD: Experience at a Tertiary Care IBD Center

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Introduction: Women with IBD often have risk factors for ectopic pregnancy (EP) including previous abdominal or pelvic surgery, pelvic sepsis or intra-abdominal adhesions. The prevalence of an ectopic pregnancy among healthy women who present to an emergency department with first trimester bleeding, pain, or both ranges from 6% to 16%. To date, the single large population-based cohort study for EP in IBD was not able to account for medication use, disease activity or severity, and was published prior to wide-spread use of anti-TNF agents in the preconception and pregnancy states. We were interested in assessing EP in our population from a tertiary care IBD center, in particular taking into account disease activity and use of biologics prior to conception.
Methods: The electronic medical record was queried for legal sex females with a diagnosis of ulcerative colitis (UC), Crohn's disease (CD) or inflammatory bowel disease (IBD) and a history of a pregnancy event receiving all of their care at our tertiary care center. From this cohort the term "ectopic pregnancy" using ICD-10 code and SNOMED concepts between 1/1/13 and 2/28/2022 were used to identify our population of interest. Chart review including diagnosis, surgical history, current and previous medications, and disease activity at the time of conception was then performed. Pregnancy specific variables include age at time of conception, parity, history of previous pregnancy loss, history of Caesarean section, or endometriosis.
Results: 20,624 legal sex females with CD, UC or IBD were identified and 335 patients were diagnosed with a pregnancy event with all of their care at our center. 6 patients were diagnosed with an EP. Of interest, only 4 had their EP after an established diagnosis of UC or CD. Of these 4 patients, 3 had UC and 1 had CD. Duration of disease prior to EP ranged from 6 months to 4 years. Of the 3 patients with UC, all were in remission on either aminosalicylate or anti TNF therapy. The patient with CD had mild activity, was status post one resection and on no medication at the time of the EP. None had other common risk factors for EP.
Conclusion: EP in our practice was uncommon, with an incidence of only 2%. Whether this is because of improved control of disease activity or preconception counseling has yet to be determined. Larger population-based studies are needed to assess the impact of newer medical therapies and disease management on the risk of this pregnancy outcome.

S978

Impact of Inflammatory Bowel Disease on Outcomes of Patients Admitted With Pulmonary Embolism: A Nationwide Perspective

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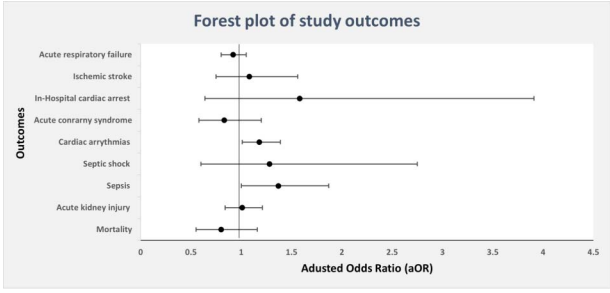
Introduction: Inflammatory Bowel Disease (IBD) patients have an established higher risk of Venous Thromboembolism, including Pulmonary Embolism (PE), secondary to chronic inflammatory state. However, Impact of IBD on the prognosis of admitted PE patients remains unstudied. Therefore, authors aim to investigate outcomes of hospitalized PE patients in the setting of IBD.
Methods: Using International Classification of Diseases Tenth Revision (ICD-10) codes, the National Inpatient Sample database of the years 2016 to 2019 was searched for patients admitted with a primary diagnosis of PE, with and without a past medical history of IBD listed as secondary diagnosis. Univariate and Multivariate logistic regression analysis was performed to determine the risk of mortality and in-hospital complications in PE/IBD group compared to PE/non-IBD group. Baseline patients and facilities characteristics were incorporated into the analysis. Data was considered statistically significant if p-value was < 0.05.
Results: Among 750,654 adults' patients who were hospitalized in US with a primary diagnosis of PE from 2016 - 2019, 6,995 (1%) had a secondary diagnosis of IBD. Patients baseline characteristics are listed in Table. After running multivariate regression analysis, history of IBD was not associated with mortality difference in PE patients (aOR 0.80, p=0.245). In term of in-hospital outcomes (Figure), IBD/PE patients had an increased risk of cardiac arrythmias (aOR 1.18, p= 0.035) and sepsis (aOR 1.37, p=0.048), with no significant difference in risk of acute kidney injury (aOR 1.01, p=0.882), septic shock (aOR 1.28, p=0.516), acute coronary syndrome (aOR 0.83, p=0.337), acute respiratory failure (aOR 0.92, p=0.244) and in-hospital cardiac arrest (aOR 2.24, p=0.319). IBD/PE group had a prolonged length of stay (aMD 0.56 days, p=< 0.001) and increased cost of care (aMD 4093$, p=0.023) when compared to admitted PE patients who are IBD-free.
Conclusion: Our study demonstrates that patients with PE have a slightly worse in-hospital outcomes in the setting of IBD, represented by increased risk of sepsis and cardiac arrythmias, and prolonged length of stay and healthcare resources utilizations. Further studies are needed to validate our findings, to prompt proper risk satisfaction and for IBD patients who are admitted with PE in a goal to reduce the incidence of the before mentioned outcomes and to reduce healthcare resources utilization in this group of patients.



[0978] **Figure 1.** Forest plot of outcomes in patient hospitalized for PE with history of IBD, compared to non-IBD Patients.

Table 1. Baseline characteristics of PE patients stratified based on diagnosis status of IBD

VARIABLE	OVERALL, PE %, No.	WITHOUT IBD %, No.	WITH IBD %, No.	P value
	100.0 (750,654)	99.0 (743659)	1.00 (6995)	
PATIENT'S CHARACTERISTICS				
AGE, MEAN YEARS	62.8	62.9	58.8 ()	< 0.001
FEMALE	51.9 (389589)	51.9 (385959)	55.1 (3854)	< 0.001
RACIAL DISTRIBUTION				< 0.001
WHITE	71.6 (537468)	71.5 (531716)	83.3 (5827)	
BLACK	18.9 (141874)	19.0 (141295)	11.2 (783)	
HISPANIC	5.83 (43763)	5.87 (43653)	2.73 (191)	
OTHERS	2.10 (15764)	2.10 (15617)	1.92 (134)	
INSURANCE TYPE				< 0.001
MEDICAID	53.6 (402351)	53.7 (399345)	47.6 (3330)	
MEDICARE	12.3 (92330)	12.4 (92214)	10.8 (755)	

Table 1. (*continued*)

VARIABLE	OVERALL, PE %, No.	WITHOUT IBD %, No.	WITH IBD %, No.	P value
PRIVATE	29.8 (223695)	29.7 (220867)	39.2 (2742)	
UNINSURED	4.06 (30477)	4.09 (30416)	2.27 (159)	
CHARLSON COMORBIDITY INDEX SCORE				< 0.001
1	23.3 (174902)	23.3 (173273)	24.1 (1686)	
2	16.5 (123858)	16.5 (122704)	16.7 (1168)	
≥3	29.3 (219942)	29.4 (218636)	22.5 (1574)	
MEDIAN ANNUAL INCOME, US$				< 0.001
1–43,999	28.5 (213936)	28.5 (211943)	22.0 (1539)	
44,000–55,999	26.5 (198923)	26.5 (197070)	25.8 (1805)	
56,000–73,999	24.8 (186162)	24.8 (184427)	26.8 (1875)	
≥74,000	20.0 (150131)	20.0 (148732)	25.3 (1770)	
HOSPITAL CHARACTERISTICS				
HOSPITAL REGION				< 0.001
NORTHEAST	18.0 (135118)	18.5 (137577)	20.8 (1455)	
MIDWEST	25.2 (189165)	25.1 (186658)	27.0 (1889)	
SOUTH	38.8 (291254)	38.8 (288540)	34.6 (2420)	
WEST	17.8 (133616)	17.8 (132371)	17.5 (1224)	
HOSPITAL BED SIZE				0.8425
SMALL	21.0 (157637)	21.0 (156168)	21.5 (1504)	
MEDIUM	29.6 (222194)	29.6 (220123)	29.8 (2085)	
LARGE	49.3 (370072)	49.3 (366624)	48.6 (3400)	
HOSPITAL LOCATION				
RURAL LOCATION	9.55 (71687)	9.57 (71168)	7.72 (540)	< 0.001
URBAN LOCATION	22.7 (170398)	22.8 (169554)	18.6 (1301)	
TEACHING HOSPITAL	67.6 (507442)	6.76 (50271)	73.6 (5148)	
COMORBIDITIES				
HYPERTENSION	42.3 (317527)	42.3 (314568)	35.6 (2490)	< 0.001
DIABETES MELLITUS	23.2 (174152)	23.3 (173273)	16.3 (1140)	< 0.001
SMOKING HISTORY	38.7 (290503)	38.7 (287796)	39.6 (2770)	0.8226
HYPERLIPIDEMIA	35.9 (269485)	36.0 (267717)	27.8 (1945)	< 0.001
OBESITY	25.4 (190666)	25.5 (189633)	19.8 (1385)	< 0.001
CHRONIC KIDNEY DISEASE	12.7 (95333)	12.7 (94445)	10.2 (713)	< 0.001
CORONARY ARTERY DISEASE	21 (157637)	17.5 (130140)	14.3 (1000)	< 0.001
PERIPHERAL VASCULAR DISEASE	21.5 (161391)	2.16 (16063)	1.86 (130)	0.2200
CONGESTIVE HEART FAILURE	16.5 (123858)	16.5 (122704)	972	< 0.001
CHRONIC OBSTRUCTIVE LUNG DISEASE	18.3 (137370)	18.3 (136090)	17.1 (1196)	0.0053
CHRONIC LIVER DISEASE	4.68 (35131)	4.67 (34729)	6.65 (465)	< 0.001
CORTICOSTEROID USE	4.13 (31002)	4.07 (30267)	11.8 (825)	< 0.001

PE=Pulmonary Embolism, IBD=Inflammatory Bowel Disease.

S979

The Risk of Depression and All-Cause Mortality in Ulcerative Colitis Patients Maintained on Tofacitinib and Using Cannabis: A Population-Based Longitudinal Study

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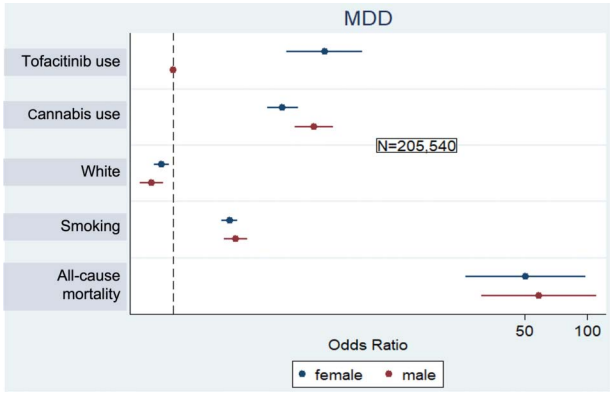
Introduction: Tofacitinib is used to treat moderate-to-severe ulcerative colitis (UC). We aim to investigate the risk of major depressive disorder (MDD) in patients with UC using tofacitinib.
Methods: We queried a multicenter database (Explorys Inc) incorporating records from 26 major healthcare systems in the United States. Using systemized nomenclature of clinical medical terms (SNOMED-CT) adult patients diagnosed with UC from January 2010-November 2021 were identified. Among this cohort, race, gender, tofacitinib, cannabis, and tobacco use were examined. Primary and secondary outcomes were risk of MDD and all-cause mortality during December 2020-November 2021. Associations were estimated via gender-stratified multivariable logistic regression models. An interaction term was introduced to test the presence of effect modification. (Figure)
Results: Out of 205540 adult patients diagnosed with UC, 3095 (1.51%) used cannabis and 37265 (18.13%) used tobacco. 360 UC patients were maintained on tofacitinib between 2018-2021. Among cannabis users, the prevalence of MDD was 9.05% (71.32% females, 28.67% males). UC patients with MDD had increased all-cause mortality compared to those without MDD, 1.11% vs 0.01%. After adjusting for confounding in the multivariate analysis, cannabis use was an independent risk factor for MDD adjusted odds ratio (aOR) 3.87 (95%CI: 3.94-4.43, P< 0.001). UC patients using tofacitinib had higher odds of MDD diagnosis aOR 3.78 (95%CI: 2.51-5.71, P< 0.001). Smokers had higher risk of MDD compared to nonsmokers aOR 1.91 (95%CI: 1.77-2.04, P< 0.001). Whites had significantly lower risk of MDD compared to non-whites aOR 0.85 (95%CI: 0.79-0.91, P< 0.001). Males had significantly lower risk of MDD compared to females aOR 0.54 (95%CI: 0.50-0.58, P< 0.001). However, males risk of MDD significantly increased if they were also cannabis users aOR 1.48 (95%CI: 1.14-1.93; P< 0.001). Compared to males, females with UC had higher risk of MDD if they were using tofacitinib aOR 5.39 (95%CI: 3.54-8.21, P< 0.001). Overall, all-cause mortality was significantly higher in UC patients with MDD aOR 54.98 (95%CI, 34.55-87.49, P< 0.001). The odds of death increased by 0.5% above baseline in UC patients with MDD if they were prescribed tofacitinib. (Table)
Conclusion: Cannabis use among UC patients is strongly associated with a diagnosis of MDD. UC patients (especially females) using tofacitinib have higher odds of being diagnosed with MDD. All-cause mortality is higher in UC patients if they are diagnosed with MDD.



[0979] **Figure 1.** Multivariable logistic regression analysis of possible predictors for major depressive disorder (MDD) in patients with ulcerative colitis. Subgroup analysis stratified by gender. Forrest plot showing adjusted odds (OR); 95% confidence interval.

Table 1. Baseline characteristics of patients with ulcerative colitis included in the study

	MDD Diagnosis (N=1,495)			Absence of MDD Diagnosis (N=204,045)		
Characteristics	**Total (N)**	**Prevalence (%)**	**95% CI**	**Total (N)**	**Prevalence (%)**	**95% CI**
Tofacitinib use						
Yes	25	0.62	0.41-0.91	335	0.16	0.14-0.18
No	4,020	99.38	99.08-99.58	201,160	99.84	99.81-99.85
Cannabis use						
Yes	280	6.92	6.17-7.74	2,815	1.39	1.34-1.44
No	3,765	93.07	92.25-93.82	198,680	98.61	98.55-98.65
Gender						
Male	1,160	28.68	27.30-30.09	84,560	41.97	41.75-42.18
Female	2,885	71.32	69.90-72.69	116,935	58.03	57.81-58.24
Race						
White	2,995	74.04	72.66-75.37	153,520	76.19	76.00-76.37
Non-White	1,050	25.96	24.62-27.33	47,975	23.81	23.62-23.99
Tobacco use						
Yes	1,270	31.39	29.98-32.84	35,995	17.86	17.69-18.03
No	2,775	68.6	67.15-70.01	165,500	82.13	81.96-82.31
All-cause mortality						
Yes	45	1.11	0.83-1.48	35	0.01	0.01-0.02
No	4,000	98.89	98.51-99.16	201,460	99.98	99.97-99.99

CI, confidence interval; MDD, major depressive disorder.

S980

Prevalence of Non-Hodgkin's Lymphoma Among IBD and Celiac Disease Patients: Results From a Population-Based Study

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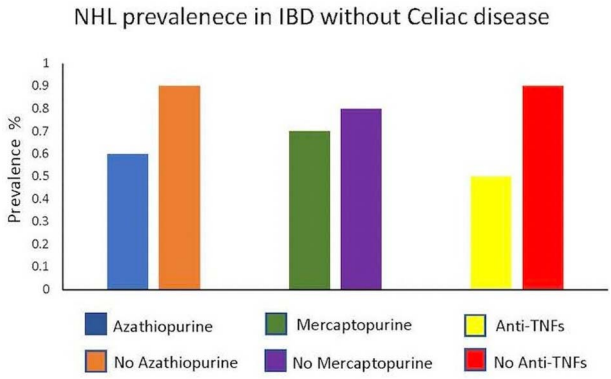
Introduction: There is an increased risk of non-Hodgkin's lymphoma (NHL) in chronic inflammatory diseases like rheumatoid arthritis and celiac disease (CD). Although inflammatory bowel disease (IBD) is associated with hematologic manifestations, the association between NHL and IBD remains unclear. Using a large database, we aimed to investigate the epidemiology and risk of NHL in IBD patients.
Methods: We queried a multi-institutional database (Explorys Inc, Cleveland, OH), an aggregate of electronic health record data from 26 US healthcare systems. We identified patients diagnosed with IBD, CD, and NHL based on Systemized Nomenclature of Medicine Clinical Terms, between 1999 and the present. We assessed the prevalence of NHL in patients with IBD without CD and CD without IBD and compared it to patients without IBD or CD.
Results: Out of more than 70 million patients in the database, we identified 187,510 with NHL (0.3%), 412,950 with IBD (0.6%), and 136,690 with CD (0.2%). The prevalence of NHL was 0.7% in CD without IBD, 0.8% in IBD without CD and 0.3% among patients without CD or IBD. The risk of NHL was higher in CD without IBD [OR 3.01 95% CI: 2.82–3.21, $p < 0.0001$] and in IBD without CD [OR 3.22 95% CI: 3.11–3.33, $p < 0.0001$] than in patients with neither IBD nor CD. In the group with IBD, the risk of NHL was higher in females vs. males (51% vs 49%), in elderly vs. adults aged 18–65 (69% vs 31%) and in Caucasians vs. non-Caucasians (84% vs 16%) (Table). IBD patients treated with anti-tumor necrosis factors (anti-TNFs) had lower rates of NHL [OR: 0.60; 95% CI: 0.53-0.68, $P < 0.0001$] vs IBD who were not on anti-TNFs. Similarly, azathioprine had lower rates of NHL [OR: 0.74; 95% CI: 0.64-0.86, $P = 0.0001$]. 6-mercaptopurine had no significant effect [OR: 0.86; 95% CI: 0.71-1.06, $P = 0.1518$] (Figure).
Conclusion: Utilizing a large population database, we report a distinct increased association of NHL in IBD and CD. Our findings of lower rates of NHL in immunosuppressed patients contradicts prior studies. These discrepant results could be a sampling error, but also could be that lower inflammatory states are associated with lower NHL rates. More study is needed to evaluate this.



[0980] **Figure 1.** The prevalence of NHL in patients with inflammatory bowel disease without history of celiac disease based on medication group. IBD; inflammatory bowel disease, NHL; non-hodgkin's lymphoma.

Table 1. Gender-, Age- and Race-Based Prevalence of NHL in individuals with IBD in the United States

	NHL in IBD (excluding those with celiac) -N (%)	OR, 95% CI, p-value
Female/ Male	1680 (51%)/ 1590 (49%)	OR 1.12 (1.01-1.23), P= 0.0260
Elderly/ Adults age 18-65	2250 (69%)/ 1020 (31%)	OR 4.84 (4.36-5.37), P< 0.0001
Caucasian/ Other	2740 (84%)/ 540 (16%)	OR 25.75 (22.60-29.34), P< 0.0001

Univariate analysis used to calculate OR. OR; odds ratio, CI; confidence interval, IBD; Inflammatory bowel disease, NHL; Non-Hodgkin's Lymphoma.

S981

Female Gender Is Associated With Decreased Resource Utilization in Patients Admitted With Ulcerative Colitis: A National Inpatient Sample Analysis

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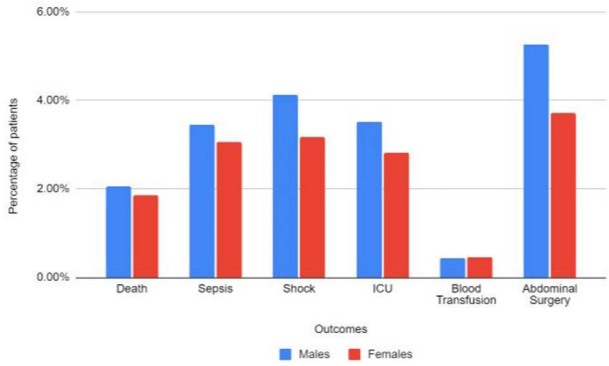
Introduction: Gender differences in incidence of patients with ulcerative colitis (UC) have been well studied. There is a similar incidence of UC in western countries before age 45, however after age 45, males have a higher incidence. Although differences in incidence of UC are known, data regarding gender disparities in the outcomes of hospitalized patients with UC are largely unknown. We investigated the impact of gender on UC hospitalization outcomes.
Methods: We queried the 2016-2019 National Inpatient Sample (NIS) databases using the ICD-10 codes. All adult patients with a diagnosis of UC (ICD-10 K51) were included. The relationship between gender and mortality, sepsis, shock, ICU, acute kidney injury (AKI), abdominal surgery, blood transfusion, length of stay and total hospitalization charge was analyzed using multivariate analysis. We adjusted for patient demographics, hospital characteristics and charlson comorbidities. Statistical analysis was performed using STATA, version 17.0.
Results: Of the 467,340 adult patients admitted with a diagnosis of UC, 253,140 (54.2%) were female. A complete list of patient characteristics is presented in Table. There was no significant difference in mortality based on gender (aOR=1, p-0.95). Females had a decreased mean length of stay (-0.21 days, p< 0.001), hospitalization charge (- $6,981.09, p < 0.001) and cost (-$1,719.44, p < 0.001) compared to males. Females also had a statistically significant lower risk of developing sepsis (aOR=0.9, p=0.005), AKI (aOR=0.71, p< 0.001) and ICU admission (aOR=0.88, p-0.001). There was no difference between males and females in the development of shock (aOR= 0.94, p=0.078) and blood transfusion (aOR=1.15 ,p-0.162). Female gender was associated with a decreased need for abdominal surgery (aOR= 0.69, p< 0.001).
Conclusion: While there was no mortality difference between the two genders, females incurred lower expenses in hospitalization charge and cost and developed lower rates of secondary outcomes such as sepsis, AKI, ICU admission and abdominal surgery. These gender differences can be due to complex interactions between genetics, immune dysregulation, environmental exposures and intestinal dysbiosis. These differences warrant further investigation and require attention by the gastroenterologists (Figure).



[0981] **Figure 1.** Outcomes of hospitalized patients with ulcerative colitis, stratified by gender

Table 1. Characteristics of hospitalized patients with ulcerative colitis stratified by gender

	Males N (%)	Females N (%)	p-value
No.	214,210	253,130	
Age, years (SD)	56.16 (+/-0.12)	57.06 (+/-0.12)	< **0.001**
Age categories			< **0.001**
18-45	63,125 (29.47)	76,400 (30.12)	
45-65	67,890 (31.69)	72,235 (28.48)	
>65	83,195 (38.84)	104,495 (41.4)	
Race			< **0.001**
White	168,430 (78.63)	195,920 (77.25)	
African American	18,140 (8.47)	26,270 (10.36)	
Hispanic	17,205 (8.03)	19,435 (7.66)	
Asian/Pacific islander	3,810 (1.78)	4,230 (1.67)	
Insurance			< **0.001**
Medicare	90,455 (42.23)	117,095 (46.17)	
Medicaid	25,405 (11.86)	32,175 (12.69)	
Private	82,100 (38.33)	91,295 (36)	
Uninsured	8,450 (3.95)	7,170 (2.83)	
Income			< **0.001**
Lowest quartile	46,585 (21.75)	57,610 (22.71)	
Second quartile	52,205 (24.37)	63,035 (24.63)	
Third quartile	58,050 (27.1)	66,145 (26.08)	
Highest quartile	57,370 (26.78)	66,840 (26.35)	
Region			< **0.001**
Northeast	49,925 (23.31)	59,430 (23.43)	
Midwest	49,765 (23.23)	56,490 (22.27)	
South	71,395 (33.33)	90,495 (35.68)	
West	43,125 (20.13)	47,215 (18.62)	
Hospital location			< **0.001**
Rural	12,575 (5.87)	17,155 (6.76)	
Urban	201,635 (94.13)	236,475 (93.24)	
Hospital bed size			< **0.001**
Small	40,915 (19.1)	50,740 (20.01)	
Medium	59,175 (27.62)	71,745 (28.29)	
Large	114,120 (53.27)	131,145 (51.71)	
Charlson comorbidity index			< **0.001**
0	84,605 (39.5)	109,330 (43.11)	
1	40,800 (19.05)	55,870 (22.03)	
2	28,925 (13.5)	33,835 (13.34)	
3	59,880 (27.95)	54,595 (21.53)	
Outcomes			
Death	4,385 (2.05)	4,685 (1.85)	**0.03**
Sepsis	7,405 (3.46)	7,755 (3.06)	< **0.001**
Shock	8,830 (4.12)	9,175 (3.17)	< **0.001**
AKI	42,145 (19.67)	36,540 (14.41)	< **0.001**
ICU admission	7,525 (3.51)	7,130 (2.81)	< **0.001**
Blood transfusion	945 (0.44)	1,175 (0.46)	0.61
Abdominal surgery	11,290(5.27)	9,455 (3.72)	< **0.001**

S982

The Progression of Crohn's Disease: Results From an Observational Study Using U.S. Claims Data

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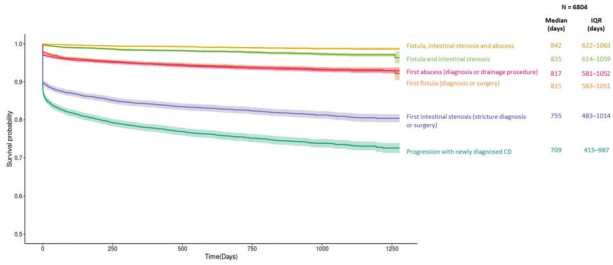
Introduction: Crohn's disease (CD) is a chronic progressive inflammatory disease of the gastrointestinal tract. Disease progression is characterized by the occurrence of CD complications, including fistula, intestinal stenosis, and abscess. The aim of this study was to characterize progression among patients with CD without complications.
Methods: This cohort study used data from the Optum claims database from 01/2016 to 06/2020. Patients without a previous CD diagnosis between 01/2017 and 06/2019 were considered as newly diagnosed cases; those with a previous CD diagnosis prior to the index date (CD diagnosis date) or 01/2017 were considered as existing cases. Patients with a history of CD progression were excluded. The primary objective was to estimate the risk of and time to progression from the time of CD diagnosis in patients newly diagnosed with CD without complications at baseline. Risk of progression (proportion of patients at risk who

progressed) was estimated for both newly diagnosed and existing CD cases at 6 months and 1, 2, and 3 years. Kaplan–Meier estimates for time to progression (duration between index date and first progression event) were generated for newly diagnosed CD cases. Other outcomes e.g., demographic characteristics, were assessed over the follow-up period (between index date and 06/2020) using descriptive statistics.
Results: In total, 23,241 patients (mean age 47.1 years [standard deviation 18.7]; 42.3% female) with CD were identified; 29.3% (n=6804) were newly diagnosed and 70.7% (n=16,437) were existing cases. The most common comorbidities in newly diagnosed and existing cases were obesity (25.4%; 18.4%), anxiety (24.5%; 21.9%), and depression (22.1%; 18.7%); extraintestinal manifestations (2.4%; 3.8%). The most common CD-related medication was antibiotics for newly diagnosed (25.2%; 18.3% existing) and acetylsalicylic acid for existing cases (27.5%; 13.1% newly diagnosed). Risk of CD progression over time ranged from 19.3% to 26.6% in newly diagnosed and 8.2% to 21.4% in existing cases (Table). A total of 6804 patients with newly diagnosed CD progressed with a median time to progression of 709 days (interquartile range: 415–987) (Figure).
Conclusion: Over 20% of all patients with CD experienced progression during the follow-up period. Intestinal stenosis was a more common complication than fistula or abscess.



[0982] **Figure 1.** Time to Crohn's disease progression events for newly diagnosed cases Time from CD diagnosis to progression event was assessed for the entire follow-up period for newly diagnosed cases only and was estimated as the time from the index date (date of the first CD diagnosis) to the progression date. If no such progression event was observed in the available follow-up period, the patient was censored. CD, Crohn's disease; IQR, interquartile range.

Table 1. Risk of Crohn's disease progression

	Period post-index date*									
	Total follow-up period		6 months		1 year		2 years		3 years	
	Newly diagnosed cases	Existing cases	Newly diagnosed cases	Existing cases	Newly diagnosed cases	Existing cases	Newly diagnosed cases	Existing cases	Newly diagnosed cases	Existing cases
Patients at risk of CD progression, n	6804	16,437	6117	15,182	5503	13,720	3875	11,238	1668	7856
Patients with CD progression†, n (%)	1714 (25.2)	3288 (20.0)	1183 (19.3)	1241 (8.2)	1188 (21.6)	1622 (11.8)	953 (24.6)	1879 (16.7)	444 (26.6)	1680 (21.4)
CD fistula (diagnosis or surgery)	430 (6.3)	990 (6.0)	270 (4.4)	327 (2.2)	293 (5.3)	456 (3.3)	259 (6.7)	535 (4.8)	125 (7.5)	499 (6.4)
Intestinal stenosis (stricture diagnosis or surgery)	1227 (18.0)	2211 (13.5)	843 (13.8)	798 (5.3)	845 (15.4)	1050 (7.7)	655 (16.9)	1224 (10.9)	320 (19.2)	1106 (14.1)
Intestinal abscess (diagnosis or drainage procedure)	443 (6.5)	729 (4.4)	275 (4.5)	259 (1.7)	293 (5.3)	372 (2.7)	269 (6.9)	464 (4.1)	112 (6.7)	411 (5.2)
Patients who underwent CD-related surgery, n (%)	354 (5.2)	684 (4.2)	198 (3.2)	214 (1.4)	217 (3.9)	305 (2.2)	206 (5.3)	417 (3.7)	95 (5.7)	384 (4.9)

*Date of the first CD diagnosis. †A patient was considered to have CD progression if they had a diagnosis CD-related fistula, intestinal stenosis, or abscess, or underwent a CD-related surgery after the index date, whichever event occurred first. The date of the first of these progression events was considered the progression date. CD, Crohn's disease.

S983

Baseline Demographics and Disease Characteristics of Patients With Ulcerative Colitis Who Responded to Vedolizumab at Week 6

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Introduction: Vedolizumab (VDZ) has demonstrated efficacy for the treatment of patients with moderate to severe ulcerative colitis (UC). Identifying similarities in baseline characteristics among patients who respond to VDZ could be valuable to establish the patient population that is most suitable for treatment with VDZ.
Methods: The baseline characteristics of patients with UC who responded to VDZ in the phase 3 clinical trials, GEMINI 1, VARSITY, and VISIBLE 1, and the phase 4 clinical trial, ENTERPRET, were pooled in order to identify similarities within the responder population. All four trials included adult patients with moderate to severe UC who had a prior inadequate response or loss of response to conventional therapies or anti-tumor necrosis factor alpha (anti-TNFα) treatment. Patients received VDZ 300 mg intravenously at weeks 0 and 2. The primary outcome was a response at week 6 defined as a decrease in partial Mayo score of ≥ 2 points and ≥ 25% from baseline, with a decrease in rectal bleeding sub-score of ≥ 1 or an absolute rectal bleeding sub-score of ≤ 1. Patient characteristics were analyzed using descriptive statistics, with mean or median values calculated across all four trials for continuous variables, and the number and proportion of responders reported for categorical variables.
Results: Of the total of 1,183 patients enrolled across the four trials, 989 (83.6%) were White, while Black or African American patients were the most underrepresented group (2.8%). At week 6, 783 patients (66.2%) had a clinical response to VDZ. The baseline characteristics of these responders are shown in Table. Of the VDZ responders, the mean disease duration was 7.4 years, and 24.5% had experienced previous treatment failure with anti-TNFα treatment. Most responders had left-sided colitis or pancolitis (Table), and the majority had moderate or severe disease at baseline (complete Mayo score category: moderate, n = 333 [42.5%]; severe, n = 440 [56.2%]). For rectal bleeding and stool frequency sub-scores, rectal bleeding with obvious blood in stool and 5 or more stools than normal were the most frequently observed categories at baseline, respectively (Table).
Conclusion: These baseline characteristics of patients who respond to VDZ at 6 weeks may serve as an indicator to determine which patients are most likely to respond to VDZ treatment.

Table 1. Baseline demographics and disease characteristics of patients who responded to VDZ treatment at week 6

Characteristic	GEMINI 1 n = 122	ENTERPRET n = 131	VARSITY n = 263	VISIBLE 1 n = 267
Race, n (%)				
White	97 (79.5)	104 (79.4)	233 (88.6)	221 (82.8)
Black or African American	3 (2.5)	12 (9.2)	0	2 (0.7)
Asian	21 (17.2)	12 (9.2)	24 (9.1)	42 (15.7)
Other	1 (0.8)	3 (2.3)	6 (2.3)	2 (0.7)

Table 1. (*continued*)

Characteristic	GEMINI 1 n = 122	ENTERPRET n = 131	VARSITY n = 263	VISIBLE 1 n = 267
Duration of disease, years, mean (SD)	6.5 (5.42)	8.3 (8.30)	7.3 (7.65)	7.6 (6.25)
Disease location, n (%)[a]				
Proctosigmoiditis	8 (6.6)	22 (16.8)	–	37 (13.9)
Left-sided colitis	56 (45.9)	52 (39.7)	–	112 (41.9)
Extensive colitis	11 (9.0)	10 (7.6)	–	20 (7.5)
Pancolitis	47 (38.5)	47 (35.9)	–	97 (36.3)
Missing	0	0	–	1 (0.4)
Complete Mayo score, median	8.0	8.0	9.0	9.0
Complete Mayo score, categories, n (%)				
Mild (score < 6)	4 (3.3)	3 (2.3)	2 (0.8)	0
Moderate (score 6–8)	62 (50.8)	68 (51.9)	105 (39.9)	98 (36.7)
Severe (score 9–12)	56 (45.9)	60 (45.8)	155 (58.9)	169 (63.3)
Missing	0	0	1 (0.4)	0
Mayo endoscopic sub-score, categories, n (%)				
Moderate disease	62 (50.8)	77 (58.8)	100 (38.0)	94 (35.2)
Severe disease	60 (49.2)	54 (41.2)	162 (61.6)	173 (64.8)
Missing	0	0	1 (0.4)	0
Partial Mayo score, median	6.0	6.0	6.0	6.0
Partial Mayo score, categories, n (%)				
Mild (score ≤ 4)	25 (20.5)	25 (19.1)	36 (13.7)	22 (8.2)
Moderate (score 5–6)	49 (40.2)	56 (42.7)	114 (43.3)	115 (43.1)
Severe (score 7–9)	48 (39.3)	50 (38.2)	113 (43.0)	130 (48.7)
Rectal bleeding sub-score, categories, n (%)				
No blood seen	10 (8.2)	24 (18.3)	19 (7.2)	12 (4.5)
Streak of blood with stool less than half of the time	40 (32.8)	35 (26.7)	70 (26.6)	78 (29.2)
Obvious blood with stool most of the time	57 (46.7)	52 (39.7)	153 (58.2)	148 (55.4)
Blood alone passes	15 (12.3)	20 (15.3)	21 (8.0)	29 (10.9)
Stool frequency sub-score, categories, n (%)				
Normal number of stools	10 (8.2)	4 (3.1)	7 (2.7)	6 (2.2)
1–2 stools more than normal	21 (17.2)	22 (16.8)	32 (12.2)	33 (12.4)
3–4 stools more than normal	42 (34.4)	48 (36.6)	119 (45.2)	98 (36.7)
≥ 5 stools more than normal	49 (40.2)	57 (43.5)	105 (39.9)	130 (48.7)
Anti-TNFα treatment status, n (%)				
Naive	80 (65.6)	5 (3.8)	217 (82.5)	156 (58.4)
Failure	36 (29.5)	1 (0.8)	46 (17.5)	109 (40.8)
Exposed, not failed	6 (4.9)	125 (95.4)	0	2 (0.8)

SD, standard deviation; TNFα, tumor necrosis factor alpha; VDZ, vedolizumab. a, Disease location was not recorded for VARSITY.

S984

Comparison of Surgery Rates in Biologic-Naive Patients With Crohn's Disease Who Were Treated With Vedolizumab or Ustekinumab: Findings From SOJOURN

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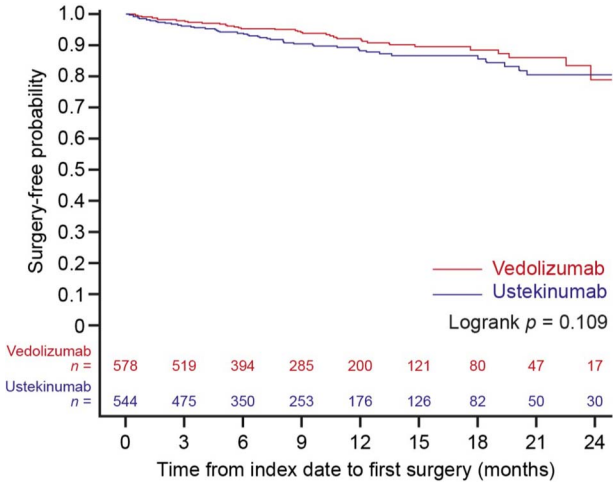
Introduction: Despite advances in medical interventions for Crohn's disease (CD), a substantial proportion of patients still require major abdominal surgery. However, most data on surgery rates are from patients receiving an anti-tumor necrosis factor α treatment, with little known about the impact of vedolizumab or ustekinumab on CD-related surgery. SOJOURN aimed to investigate the hazard rate and incidence rate of first CD-related surgery on biologic treatment in biologic-naive patients with CD who were treated with vedolizumab or ustekinumab.
Methods: SOJOURN was a retrospective, observational cohort study conducted using administrative claims data from the Optum® Research Database. Adult patients with at least one claim for vedolizumab or ustekinumab between January 1, 2018 and December 31, 2019 were included, with the index date assigned as the date of the first claim for a study drug. Patients were required to have no claims for an advanced therapy in the 6 months before the index date. Follow-up started on the day after the index date and ended on the earliest of the following: discontinuation, switching or initiation of combination treatment, disenrollment, surgery event, or the end of the study period. Kaplan–Meier analysis was used to estimate the time to CD-related surgery. The hazard rate and incidence rate of CD-related surgery was compared between the vedolizumab and ustekinumab cohorts using a Cox proportional hazards model and a Poisson regression model, respectively.
Results: Of 1,122 eligible patients with CD, 578 received vedolizumab and 544 received ustekinumab. During the variable follow-up period, 42 patients receiving vedolizumab and 54 patients receiving ustekinumab underwent surgery ($p = 0.111$), with a mean time from index date to date of first surgery of 229.9 days and 189.5 days ($p = 0.271$), respectively. After 1 year of follow-up, 8% of patients receiving vedolizumab and 12% of patients receiving ustekinumab had undergone surgery (logrank $p = 0.109$; Figure). After adjusting for baseline covariates, vedolizumab was associated with a 34.2% lower hazard rate of surgery (hazard ratio, 0.658; 95% confidence interval [CI], 0.436–0.994; $p = 0.047$) and a 34.5% lower incidence rate of surgery (rate ratio, 0.655; 95% CI, 0.434–0.988; $p = 0.044$) than ustekinumab.
Conclusion: The results of this real-world analysis of biologic-naive patients with CD suggest that vedolizumab may be more effective than ustekinumab for the reduction of CD-related surgery on biologic treatment.



[0984] **Figure 1.** Kaplan–Meier curve for time to first Crohn's disease-related surgery

S985

Adherent-Invasive *Escherichia coli* Strain O83:H1 Induces Inflammatory Response in Crohn's Disease

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Introduction: Several studies suggest that Adherent-Invasive Escherichia Coli (AIEC) colonize the ileal mucosa of Crohn's disease (CD) patients. These strain is able to adhere to and invade intestinal epithelial cells, and survive within macrophages, prompting an inflammatory response. The aim of this study was to investigate,by using an organ culture model, the ability of AIEC strain O83:H1 to colonize intestinal epithelial cells of CD patients, inducing chronic inflammation.
Methods: An organ culture model conducted with colonic biopsies derived from CD patients was set up to evaluate the ability of AIEC strain 083:H1, compared to a non-pathogenic E. Coli (NP) strain, to upregulate CEACAM 6 (CarcinoEmbryonic Antigen-related Cellular Adhesion Molecule 6), LAMP-1 (Lysosome Associated Membrane Protein 1), ICAM-1 (Intracellular Adhesion Molecule) and HLA-DR antigen expression , by immunohistochemistry, and to induce IFN-γ, TNF-α and IL-8 production, by RT-PCR. The staining of epithelial cells that expressed CEACAM6 and LAMP1 as well as the expression of ICAM1 on blood vessels was evaluated in terms of staining intensity. The number of LAMP1 and HLA-DR lamina propria mononuclear cells (LPMNC) was evaluated within a total area of 1 mm2 of lamina propria.
Results: Expression of CEACAM6 on intestinal epithelial cells, and the expression of LAMP-1 either on epithelium as well as in the LPMNCs, were significantly increased (P< 0,05) in the biopsies cultured with the AIEC strain O83:H1 compared to the biopsies cultured with non-pathogenic (NP) strain. ICAM-1 and HLA-DR were significantly increased (P< 0,05) on blood vessels and on LPMNCs, respectively, in presence of AIEC strain O83:H1 as compared with NP strain. Moreover we observed a higher level of IFN-γ, TNF-α and IL-8 mRNA trascripts in biopsies cultured with AIEC strain 083:H1 than in biopsies cultured with NP strain.
Conclusion: Expression of CEACAM6 on intestinal epithelial cells, and the expression of LAMP-1 either on epithelium as well as in the LPMNCs, were significantly increased (P< 0,05) in the biopsies cultured with the AIEC strain O83:H1 compared to the biopsies cultured with non-pathogenic (NP) strain. ICAM-1 and HLA-DR were significantly increased (P< 0,05) on blood vessels and on LPMNCs, respectively, in presence of AIEC strain O83:H1 as compared with NP strain. Moreover we observed a higher level of IFN-γ, TNF-α and IL-8 mRNA trascripts in biopsies cultured with AIEC strain 083:H1 than in biopsies cultured with NP strain.

S986

Online Animation-Enhanced CME Improves Knowledge on Sphingosine 1 Phosphate Receptor Modulation for the Treatment of Ulcerative Colitis

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Introduction: Ulcerative colitis (UC) is characterized by uncontrolled immune response in the intestinal mucosa. Sphingosine 1 phosphate (S1P) receptor modulators are a new treatment for moderate to severely active UC. The aim of this study was to examine the effect of online continuing medical education (CME) with enhanced animation graphics to increase knowledge on oral S1P-targeted treatments for UC.
Methods: Gastroenterologists (N=89) participated in an online CME activity that featured video discussion, synchronized slides, and whiteboard animation. Educational effect was assessed using a repeated-pair design with pre-/post-assessment including 3 multiple choice questions that assessed knowledge and 1 question that assessed confidence. A paired samples t-test was used for significance testing on overall average number of correct responses and for confidence rating, and a McNemar's test was conducted at the learning theme level (5% significance level, $P < .05$). The activity launched on August 31, 2021; data were collected on November 15, 2021.
Results: Overall 52% of leaners improved knowledge regarding the mechanism of action (MOA) and on data for S1P receptor modulators. Improvements in knowledge and confidence pre/post education are reported: Mechanism of S1P modulators: There was a 125% relative increase (28%/63%, pre/post; $p < .001$) in knowledge on the MOA of S1P receptor modulators for the treatment of UC. 58% and 37% of learners increased or maintained, respectively, their confidence in their ability to describe S1P receptor modulators as a therapeutic target for UC. Data on S1P receptor modulators: There was a 15% relative increase (74%/85%, pre/post; $p < .01$) in knowledge regarding clinical data from trials of S1P receptor modulators. Safety and monitoring considerations: There was a 64% relative increase (33%/54%, pre/post; $p < .001$) in knowledge about safety considerations and monitoring associated with use of S1P receptor modulators in practice.
Conclusion: Video-based CME with a whiteboard animation showing the MOA of S1P receptor modulators improved knowledge and confidence on the mechanism of S1P modulation in UC treatment, data, and safety considerations for S1P modulators. This study reveals the need for more education on the MOA of S1P modulation and safety considerations for their use in practice.

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S987

Racial and Ethnic Disparities in Health-Related Quality of Life in Patients With Inflammatory Bowel Disease: Results From the National Health and Wellness Survey

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Introduction: Racial and ethnic disparities in health-related quality of life (HRQoL) have been observed in several conditions, with Black, Indigenous, and People of Color (BIPOC) reporting worse outcomes than White individuals. Here, sociodemographics and patient-reported outcomes (PROs) were compared in White, Black, and Hispanic individuals with inflammatory bowel disease (IBD).
Methods: Data were obtained from the National Health and Wellness Survey (NHWS; 2018-2020). Adults with a self-reported physician diagnosis of Crohn's disease (CD) or ulcerative colitis (UC) were included. Bivariate (interim) analyses were conducted to compare sociodemographics and PROs across racial/ethnic groups.

Results: Analyses included 1,077 participants with CD (818 White, 109 Black, and 150 Hispanic) and 1,500 with UC (1,150 White, 99 Black, and 251 Hispanic). Black and Hispanic participants were younger than White participants with CD or UC (P< 0.001). A higher proportion of Black participants with CD had not completed a college program than White participants, and a higher proportion of Hispanic participants with CD and UC were employed full time than White participants (P< 0.05). Hispanic participants had significantly worse HRQoL across several PROs (including PHQ-9, GAD-7, MCS, SF-6D index, and EQ-5D index; see Table) than White or Black participants with CD or UC (P< 0.001 for all Hispanic vs. White comparisons for above-listed PROs; P≤0.038 for PHQ-9, GAD-7, and EQ-5D index only for Hispanic vs. Black). Hispanic participants with CD also had greater mean percent work impairment assessed using the Work Productivity and Activity Impairment (WPAI) questionnaire than White (P< 0.001) or Black (P≤0.038 for all components except absenteeism) participants. Hispanic and Black participants with UC had worse WPAI outcomes than White participants (all components P≤0.001 for Hispanic vs. White; P≤0.049 for absenteeism and overall work productivity impairment only for Black vs. White).

Conclusion: Results indicated that Hispanic participants with IBD had worse HRQoL and WPAI outcomes than White or Black participants, supporting important distinctions between racial and ethnic groups. Differences in sociodemographics were also observed between groups. Notably, sociodemographics for NHWS participants, including Hispanics, differ from national estimates. Further research is needed to better understand the factors impacting HRQoL in different racial and ethnic groups with IBD.

Table 1. Sociodemographics and patient-reported outcomes in White, Black, and Hispanic participants with IBD

	CD (N = 1,077)			UC (N = 1,500)		
	White (n = 818)	Black (n = 109)	Hispanic (n = 150)	White (n = 1,150)	Black (n = 99)	Hispanic (n = 251)
Female, n (%)	421 (51.5%)	55 (50.5%)	55 (36.7%)†	696 (60.5%)	47 (47.5%)*	138 (55.0%)
Age in years, mean (SD)	48.34 (16.48)	36.84 (14.39)*	34.05 (11.05)†	52.48 (16.28)	38.48 (16.08)*	38.45 (14.27)†
Marital status, n (%)						
Married/living with a partner	518 (63.3%)	37 (33.9%)*	94 (62.7%)‡	718 (62.4%)	29 (29.3%)*	125 (49.8%)†,‡
Single, not married/divorced/ separated/widowed	299 (36.6%)	71 (65.1%)*	56 (37.3%)‡	429 (37.3%)	70 (70.7%)*	124 (49.4%)†,‡
Decline to answer	1 (0.1%)	1 (0.9%)	0 (0.0%)	3 (0.3%)	0 (0.0%)	2 (0.8%)
Education, n (%)						
Less than a college graduate	383 (46.8%)	66 (60.6%)*	81 (54.0%)	564 (49.0%)	59 (59.6%)	133 (53.0%)
College graduate or higher	434 (53.1%)	43 (39.4%)*	69 (46.0%)	582 (50.6%)	39 (39.4%)	118 (47.0%)
Decline to answer	1 (0.1%)	0 (0.0%)	0 (0.0%)	4 (0.3%)	1 (1.0%)	0 (0.0%)
Employment status, n (%)						
Employed full time	364 (44.5%)	56 (51.4%)	94 (62.7%)†	424 (36.9%)	44 (44.4%)	132 (52.6%)†
Self-employed	54 (6.6%)	9 (8.3%)	13 (8.7%)	78 (6.8%)	9 (9.1%)	15 (6.0%)
Employed part time	83 (10.1%)	14 (12.8%)	12 (8.0%)	85 (7.4%)	17 (17.2%)*	30 (12.0%)
Homemaker	39 (4.8%)	7 (6.4%)	3 (2.0%)	73 (6.3%)	3 (3.0%)	19 (7.6%)
Retired	159 (19.4%)	2 (1.8%)*	9 (6.0%)†	321 (27.9%)	9 (9.1%)	29 (11.6%)
Student	21 (2.6%)	9 (8.3%)*	7 (4.7%)	16 (1.4%)	8 (8.1%)	8 (3.2%)
Long-Term Disability	56 (6.8%)	5 (4.6%)	5 (3.3%)	84 (7.3%)	2 (2.0%)	12 (4.8%)
Not employed (whether looking for work or not)	42 (5.1%)	7 (6.4%)	7 (4.7%)	69 (6.0%)	7 (7.1%)	6 (2.4%)
Household income, n (%)						
< $25,000	102 (12.5%)	32 (29.4%)*	16 (10.7%)	166 (14.4%)	22 (22.2%)*	39 (15.5%)
$25,000 to < $50,000	163 (19.9%)	20 (18.3%)	29 (19.3%)	235 (20.4%)	25 (25.3%)	53 (21.1%)
$50,000 to < $100,000	289 (35.3%)	29 (26.6%)	47 (31.3%)	409 (35.6%)	29 (29.3%)	74 (29.5%)
$100,000+	246 (30.1%)	27 (24.8%)	57 (38.0%)	299 (26.0%)	23 (23.2%)	77 (30.7%)
Decline to answer	18 (2.2%)	1 (0.9%)	1 (0.7%)	41 (3.6%)	0 (0.0%)	8 (3.2%)
Health insurance, n (%)						
Not insured	58 (7.1%)	16 (14.7%)*	21 (14.0%)†	88 (7.7%)	11 (11.1%)	37 (14.7%)†
Commercially insured	456 (55.7%)	65 (59.6%)	91 (60.7%)	583 (50.7%)	54 (54.5%)	149 (59.4%)†
Medicaid	81 (9.9%)	10 (9.2%)	11 (7.3%)	85 (7.4%)	13 (13.1%)	21 (8.4%)
Medicare	203 (24.8%)	15 (13.8%)*	14 (9.3%)†	362 (31.5%)	16 (16.2%)*	27 (10.8%)†
Other type of insurance/unsure	20 (2.4%)	3 (2.8%)	13 (8.7%)†	32 (2.8%)	5 (5.1%)	17 (6.8%)†
HRQoL, mean (SD)						
PHQ-9 score[a]	8.75 (7.40)	8.33 (5.71)	12.56 (7.23)†,‡	7.51 (7.02)	8.57 (6.70)	10.65 (7.28)†,‡
GAD-7 score[b]	6.55 (6.16)	6.68 (4.99)	9.49 (5.83)†,‡	5.57 (5.59)	6.53 (5.21)	8.31 (5.47)†,‡
MCS score[c]	41.76 (11.94)	40.86 (10.79)	36.90 (9.90)†,‡	43.67 (12.24)	41.96 (11.02)	38.71 (9.93)†
PCS score[c]	43.80 (10.29)	44.16 (9.47)	41.96 (8.16)	44.46 (10.33)	44.61 (8.48)	43.67 (8.91)
SF-6D Index score[c]	0.630 (0.14)	0.612 (0.13)	0.556 (0.12)†,‡	0.647 (0.14)	0.618 (0.16)	0.586 (0.13)†
EQ-5D Index score[d]	0.724 (0.21)	0.720 (0.17)	0.628 (0.23)†,‡	0.739 (0.19)	0.747 (0.16)	0.670 (0.21)†,‡
EQ VAS score	63.56 (24.95)	60.54 (29.98)	61.38 (28.27)	64.43 (25.91)	67.75 (28.53)	63.73 (27.16)
WPAI[e], mean % (SD)						
Absenteeism	19.16 (26.28)	25.97 (27.50)	31.09 (28.64)†	16.26 (25.68)	24.43 (28.78)*	29.51 (26.84)†
Presenteeism	41.46 (34.06)	40.13 (31.43)	55.74 (30.00)†,‡	35.46 (33.05)	42.06 (34.01)	51.30 (30.35)†
Overall work productivity impairment	45.47 (36.72)	50.03 (35.17)	63.43 (32.09)†,‡	39.23 (35.94)	50.24 (38.80)*	60.28 (32.45)†
Activity impairment	43.47 (31.59)	44.77 (28.98)	57.07 (29.66)†,‡	40.28 (31.63)	45.45 (35.72)	48.45 (29.25)†

a PHQ-9 includes nine items (range of 0 to 27) where higher scores indicate mores severe depression. b GAD-7 includes seven items (range 0 to 21) and a higher score indicates more severe general anxiety disorder. c Differences in 3 points on the norm-based component summary scores and 0.041 points on health utilities represent clinically meaningful differences. d The minimally important difference for this measure is considered to be approximately 0.074 points. e Absenteeism was not calculated for those who worked zero hours and missed zero hours in the last seven days and presenteeism was only asked among those who worked more than zero hours in the last seven days. * P < 0.05 between Black/African American and White participants. † P < 0.05 between Hispanic and White participants. ‡ P < 0.05 between Hispanic and Black/African American participants. Note: P values were calculated using Bonferroni-adjusted pairwise comparisons. Abbreviations: CD = Crohn's Disease; EQ = EuroQoL; GAD = general anxiety disorder; HRCU = healthcare resource utilization; HRQoL = health-related quality of life; IBD = inflammatory bowel disease; MCS = mental component summary; PAM = patient activation measure; PCS = physical component summary; PHQ = patient health questionnaire; SF = short form; UC = ulcerative colitis; VAS = visual analogue scale; WPAI = work productivity and activity impairment.

S988

Obesity as a Prognostic Factor for Colonic Resection in Patients With Ulcerative Colitis: Insights From the National Inpatient Sample

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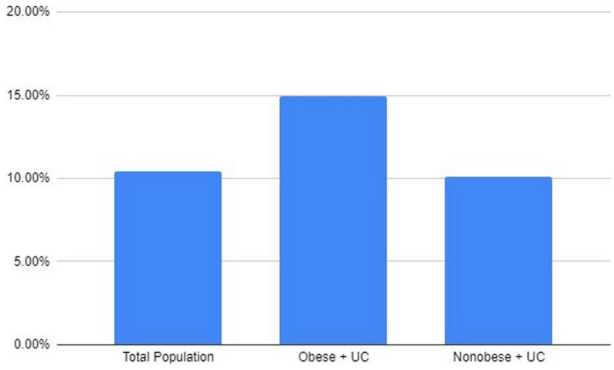
Introduction: In ulcerative colitis (UC), there are several biologic and lifestyle factors that are associated with development and progression of disease. Poorly controlled UC often results in colectomy, frequently with high rates of postoperative complications. Previous research has suggested a relationship between obesity and UC prognosis in certain areas, but a potential relationship between obesity and need for colonic resections has not been established.

Methods: This is a retrospective cohort study using the 2019 National Inpatient Sample (NIS). Inclusion criteria were a principal diagnosis of UC and age >18. The patients were divided into two groups: obese and nonobese based on a secondary diagnosis of obesity. The primary outcome was the rate of colonic resection. Secondary outcomes were: 1) mortality 2) underwent colonoscopy 3) length of stay 4) total hospital charges. Confounders were adjusted for using multivariate regression analysis of the following variables: sex, income, race, insurance, Charlson comorbidity index (CCI), hospital bedsize, location, teaching status, and region

Results: 34,490 Patients were included in the study, 7.26% of which were obese. Both obese and nonobese groups predominantly consisted of Caucasian females with a CCI of 0 who were treated at large, urban teaching hospitals in the Southern United States. The mean age of the total population was 49.6. For the total patient population studied, 37.51% required a colonoscopy and 10.4% required resection. Compared to the rate of resection in patients without obesity, those with UC and obesity had a 70% increase in odds of colonic resection when compared to non obese patients while adjusting for confounders. Secondary outcomes showed no statistically significant differences between the two groups.

Conclusion: Obesity continues to pose a significant challenge to healthcare providers, as it creates strain on hospitals while also increasing likelihood of detrimental sequelae. This study demonstrates that individuals admitted with a primary diagnosis of ulcerative colitis, who are also obese are at increased risk of undergoing colonic resection. Based on these results, obesity acts as a negative prognostic factor in the disease process of UC and should enter into discussion that all physicians have with their patients upon initial diagnosis of UC. Studies have found that rates of obesity are increasing amongst the population diagnosed with UC, making this discussion even more crucial to guiding care.



[0988] **Figure 1.** Graphical representation of nonobese versus obese patients hospitalized for UC who underwent colonic resection during hospitalization. UC = ulcerative colitis

S989

Exploring Patients' Perceptions of Clinical Research in Inflammatory Bowel Disease and Barriers to Participating in Clinical Trials

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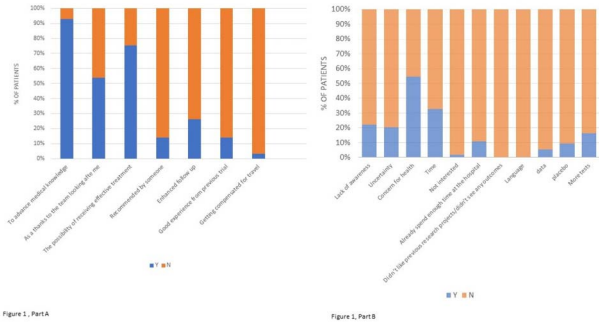
Introduction: The rising incidence and prevalence of inflammatory bowel disease (IBD), its uncertain aetiology and multidimensional and negative effects on people's lives have underscored the importance and need for research across disciplines. Despite this, participation in research in IBD remains relatively low with virtually no data exploring patients' perceptions and barriers to participation in research among people living with IBD. This is a preliminary report from an on-going study in the UK.

Methods: Ambulatory patients with IBD attending clinical visits at our centre were invited to complete a questionnaire survey. Information on patient demographics, disease duration and activity were recorded and patient perceptions and barriers to participating in research were explored.

Results: Of 163 patients approached to date, 141 (87%) consented to complete the questionnaire. Of 22 patients who declined, 86% were male. Among 141 participants, 82 (58%) were female, age between 18 to >80. Seventy-one patients had Crohn's disease (CD,50%), 59 ulcerative colitis (UC) (42%), 5 (4%) had IBD-unspecified and 6 (4%) were unsure of their diagnosis. 102 (72%) patients were on biologics. The mean Harvey Bradshaw Index (HBI) was 4 (CD) and partial Mayo score 2 (UC). 129/141 (91%) said they would participate in research but only 57% stated they would be interested in drug trials. Reasons cited for participation were to advance medical knowledge (91/129, 71%) followed by the possibility of effective treatment (31/129, 24%). Of those that stated they were not interested in research at all, 8/12 (67%) were male. Their most important reason for not wanting to participate was time constraints followed by concern for health. Although not compulsory to answer if patients were interested in research, a further 43/129 (36%) answered what disinterests them. In the whole cohort 55/141 (39%) it was secondary to concern for their own health (44%) followed by time (24%). Only a small number felt that the possibility of receiving a placebo (5/55, 9%) or having more tests (9/55 16%) would detract them from research. The factors that made patients more likely to participate in research were direct conversation with their doctor (88/141, 62%) and if they were more "unwell" (50/141, 35%).

Conclusion: Most patients are interested in participating in IBD research although fewer were interested in drug trials. The study is recruiting well currently and more data will be available for analysis and reporting in the coming months.



[0989] **Figure 1.** Graph showing all reasons for patients' interest or lack of interest in research Part A All reasons patients are interested in participating in research Part B All reasons patients are not interested in participating in research

S990

Cost Analysis of Inpatient Originator Infliximab (Remicade) vs Biosimilar Infliximab (Renflexis) for Acute Severe Ulcerative Colitis: A Cost Minimization Study

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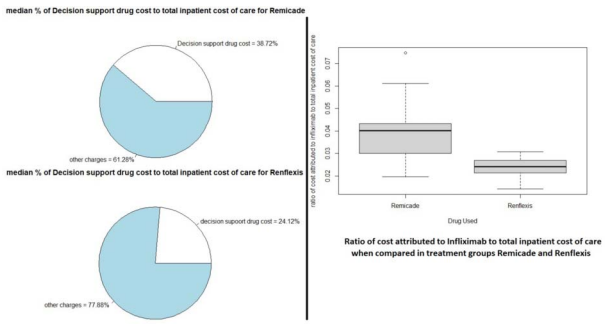
Introduction: Infliximab (IFX) is a standard, inpatient salvage therapy for treatment of refractory acute severe ulcerative colitis (ASUC). Inpatient IFX, as the originator Remicade, significantly increases colectomy-free survival in this population. The biosimilar Renflexis offers reduced cost as compared to Remicade. We performed a cost-minimization analysis to compare costs with Remicade and Renflexis for inpatient treatment of ASUC.
Methods: Retrospective clinical and financial data was obtained from 34 inpatients with refractory ASUC who had received treatment with Renflexis (17) or Remicade (17) between 2019-2021. Clinical data included admission and discharge serum albumin (alb), hemoglobin (Hgb), C-reactive protein (CRP), and colectomy rate within 30 days of treatment (CR-30). Financial data included a decision support drug cost (DSDC), depicting the total cost associated with inpatient infliximab administration, and total inpatient care cost, depicting the full cost of the inpatient admission. The following equation generated a ratio (rDSDC) which represents the percentage of how much the DSDC accounts for the total inpatient care cost, after controlling for dose of infliximab and length of stay. [DSDC of IFX/Number of Units of IFX] ÷ [Total Inpatient Cost of Care/Length of Stay in Days] Mean and unpaired T-test (parametric test) were used for clinical data analysis. Median and non-parametric test called Wilcoxon ranked sum test were used for financial data analysis. (Figure)
Results: No differences were found in baseline or discharge clinical parameters including baseline CRP (P=0.64), alb (P=0.1294), Hgb (P=0.5051), discharge CRP (P=0.1244), alb (P=0.8728), Hgb (P=0.4875), or CR-30 (23.53% vs. 29.41%, p=0.6975) (Table). Median rDSDC was 0.387 vs. 0.241 in the Remicade vs. Renflexis groups, respectively (Figure, p = 0.0025) representing a difference of ~14%.
Conclusion: A 14% reduction in cost attributed to DSDC was found using Renflexis, as compared to Remicade, treating inpatient ASUC. Our calculation included median decision support drug cost as a percentage of the total inpatient care cost, controlling for dose of infliximab and length of stay. Such a reduced cost structure promotes use of Renflexis for ASUC inpatients, which may result in improved utilization, improved health outcomes, and reduced costs for patients and hospitals. Further studies may confirm non-inferiority and demonstrate cost-effectiveness.



[0990] **Figure 1.**

Table 1.

		Remicade (n=17)	Renflexis (n=17)	P- Value
Admission	C-reactive protein	117.73 mg/L	103.98 mg/L	0.6400
	Albumin	2.74 g/dL	2.45 g/dL	0.1294
	Hgb	11.34 g/dL	10.82 g/dL	0.5051
Discharge	C-reactive protein	17.18 mg/L	30.99 mg/L	0.1244
	Albumin	2.36 g/dL	2.4 g/dL	0.8728
	Hgb	10.11 g/dL	9.71 g/dL	0.4875
Colectomy rate within 30 days of Treatment		23.53% (n=4)	29.41% (n=5)	0.6975
Median ratio of decision support drug cost to total inpatient cost of care after accounting for number of units of IFX administered and length of inpatient stay in days		0.387	0.241	**0.0025**

S991

Biomarkers for the Evaluation of Pouch Inflammation: A Systematic Review

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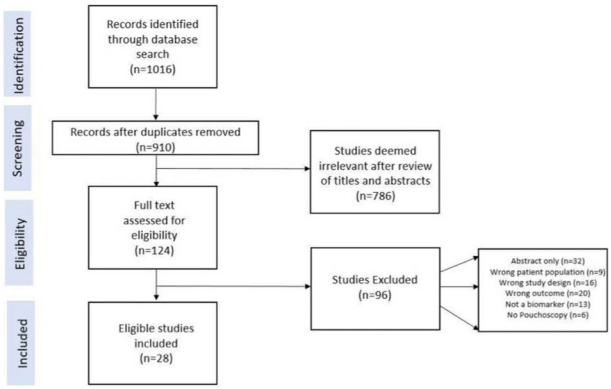
Introduction: Pouch inflammation is a common problem following ileal pouch anal anastomosis (IPAA). Despite its high prevalence, diagnosis remains multimodal and requires endoscopic assessment. The use of biomarkers in this setting has not been well characterized. We performed a systematic review to summarize the evidence for use of biomarkers in the evaluation of pouch inflammation.
Methods: A search of Ovid, MEDLINE, Cochrane Library, EMBASE, and Web of Science was conducted. Inclusion criteria included studies in the English language that evaluated biomarkers for the evaluation and prediction of inflammation in patients with IPAA utilizing pouchoscopy as the gold standard for diagnosis. Exclusion criteria included studies on the role of the microbiome and/or genetic markers as well as studies in non-human subjects.
Results: 28 studies, five case control and 23 observational cohort studies, were identified (Figure). Fecal biomarkers were assessed in 23 studies. Fecal calprotectin was the most commonly studied stool biomarker with sensitivities ranging from 57 to 100% and specificities from 69 to 92% (Table). Six studies examined serum biomarkers. None of the serum biomarkers demonstrated high sensitivity or specificity in association with pouch inflammation. Six studies described the longitudinal assessment of biomarkers. Of these studies, only three reported a predictive role of biomarkers in diagnosing endoscopic inflammation.
Conclusion: Biomarkers have emerged as a potential option to help improve the management of pouchitis given the relative ease of sampling compared to endoscopy. Unfortunately, the evaluated biomarkers have not consistently demonstrated accuracy in predicting inflammation. Moreover, these biomarkers have not been reliably shown to be sensitive or specific in association with endoscopic pouch inflammation to merit their widespread use in clinical practice. Hence, identification of novel, validated biomarkers for pouchitis is a research priority.



[0991] **Figure 1.** PRISMA Diagram of Included Studies

Table 1. Association of Fecal Calprotectin with Pouch Inflammation

Author	Year	Study Design	Patient Number	Median Age (range)	Pre-Operative Diagnosis	Pouchitis Definition	Biomarker	Cut-Off (μg/g)	Association Between Biomarker and PDAI	Sensitivity (%)	Specificity (%)
Thomas	2000	Prospective Cohort	24	NP	UC (16) FAP (8)	Macroscopic inflammation and histologic inflammation	Fcalpro	NP	All patients with inflammation had elevated fcalpro	NP	NP
Pronio	2016	Prospective Cohort	40	52 (33-71)	UC	PDAI ≥7	Fcalpro	66.2 37.6	*Endoscopy subscore:* NP *Total PDAI:* r=0.55 p=0.002 AUC: 0.832	85 92	38 19
Johnson	2009	Prospective Cohort	54	47	UC (46) FAP (8)	PDAI ≥7	Fcalpro	92.5	*Endoscopy subscore:* r=0.605 p< 0.0001 *Total PDAI:* r=0.71 p≤0.001	90	76.5
Farkas	2015	Prospective Cohort	33	NP (30-40)	UC (46) FAP (8)	PDAI ≥7	Fcalpro	262	*Endoscopy Subscore:* Significant association with p=0.0001 *Total PDAI:* AUC=0.78	67	89
Pakarinen	2010	Prospective Cohort	32	24 (17-31)	UC	Histologic neutrophil count and episodes of pouchitis	Fcalpro	300	*Histologic neutrophil count:* r=0.715 p< 0.001 *Episodes of pouchitis:* r=0.457 p< 0.01	57	92
Ollech	2021	Prospective Cohort	156	43 (35-58)	UC	Endoscopic PDAI ≥5	Fcalpro	462	*Severity of pouchitis:* r=0.526 p=0.0017	66.7	82.4

Legend: NP=not provided, UC = ulcerative colitis, FAP=familial adenomatous polyposis, fcalpro = fecal calprotectin, PDAI=pouchitis disease activitiy, index

S992

Burden and Impact of Cannabis Use Disorder on IBD Flare-Up/Emergent Admissions: A National Population-Based Analysis

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Introduction: Cannabis use has been explored for its potential symptom relief and improvement in quality of life of inflammatory bowel disease (IBD) patients without any clearly proven benefits yet. Data outlining the burden of cannabis dependence and its impact on overall outcomes of IBD flare-up emergent admissions are limited.
Methods: We queried the National Inpatient Sample (2019) using the ICD-10/CCS codes for IBD flareup admissions and CUD. The IBD flareup was defined as IBD patients admitted non-electively or undergoing an emergency room treatment. Baseline characteristics, comorbidities and in hospital outcomes [MACCE:all-cause mortality, acute myocardial infarction (MI), cardiac arrest and stroke], intestinal obstruction, colorectal cancer, colectomy, acute kidney injury[AKI], and sepsis) were compared between CUD and non-CUD cohort among IBD flareup admissions. Multivariable regression analyses were performed adjusting for demographics, hospital-level characteristics and relevant comorbidities.
Results: A total of 280925 IBD flareup admissions were identified in our study, of which 8625 (3.1%) had a reported CUD. The CUD cohort [median age was 37(IQR 28-48)] often consisted of male, white, patients belonging to the lowest median household income quartile (34.2%) and Medicaid enrollees (38.9%) of IBD flare-up admissions. The CUD cohort had a lower rate of cardiovascular comorbidities including hypertension, hyperlipidemia, diabetes, obesity, peripheral vascular disease and pulmonary comorbidities except higher rate of tobacco use disorder and drug abuse vs. non-CUD cohort. A multivariate analysis after adjusting for all potential covariates showed lower odds of sepsis with an OR of 0.61 (0.39-0.94, p < 0.024). However, MACCE and other outcomes were comparable between both groups without any significant difference (p< 0.05). Majority of IBD flareup hospitalisations with CUD had a routine disposition with a median hospital stay of 4 days and costs upto 30,936 USD (IQR 18168-58119) vs 32901 USD (IQR 18977-61686) in the non-CUD cohort (Table).
Conclusion: Our study showed a lower risk of sepsis with cannabis use in IBD flareup admissions. This paves the way for further conducting observational studies and clinical trials in order to explore potential role/impact of medicinal/recreational use of cannabis in IBD flare-ups or emergent hospitalizations.

Table 1. **Baseline characteristics of Hospitalizations with vs without Cannabis Use Disorder (CUD) and inhospital outcomes in IBD- flareup admissions 2019**

Variable		Total Admissions with No CUD	Total Admissions with CUD	P value
Age (years) at admission	Median [IQR]	57 (39-71)	37 (28-48)	< 0.001
Sex	Male Female	117680 (43.2%) 154610 (56.8%)	4965 (57.6%) 3660 (42.4%)	< 0.01
Race	White Black Hispanic Asian or Pacific Islander Native American Others	209740 (78.5%) 30540 (11.45%) 16490 (6.2%) 3470 (1.3%) 980 (0.4%) 5860 (2.2%)	5535 (65.2%) 2030 (23.9%) 620 (7.3%) 20 (0.2%) 40 (0.5%) 240 (2.8%)	< 0.01
Median household income national quartile for patient ZIP Code	0-25th 26-50th 51-75th 76-100th	67385 (25.1%) 67740 (25.2%) 69805 (26%) 63365 (23.6%)	2885 (34.2%) 2295 (27.2%) 1970 (23.4%) 1280 (15.2%)	< 0.01
Primary expected payer	Medicare Medicaid Private incl HMO Self-pay No charges Others	123640 (45.4%) 38775 (14.3%) 90865 (33.4%) 10390 (3.8%) 960 (0.4%) 7420 (2.7%)	1675 (19.5%) 3350 (38.9%) 2370 (27.5%) 850 (9.9%) 95 (1.1%) 270 (3.1%)	< 0.01
Elective versus non-elective admission	Non elective Elective	270510 (99.4%) 1765 (0.6%)	8590 (99.6%) 35 (0.4%)	0.05
Region of hospital	Northeast Mid-West South West	58565 (21.5%) 65785 (24.2%) 100925 (37.1%) 47025 (17.3%)	1480 (17.2%) 2095 (24.3%) 3230 (37.4%) 1820 (21.1%)	< 0.001
Location/teaching status of hospital	Rural Urban Non-Teaching Urban Teaching	20060 (7.4%) 46965 (17.2%) 205275 (75.4%)	380 (4.4%) 1420 (16.5%) 6825 (79.1%)	< 0.001
COMORBIDITIES				
Hypertension, complicated		47915 (17.6%)	510 (5.9%)	< 0.001
Hypertension, uncomplicated		78475 (28.8%)	1750 (20.3%)	< 0.001
Diabetes with chronic complications		33750 (12.4%)	545 (6.3%)	< 0.001
Diabetes without chronic complications		20240 (7.4%)	255 (3.0%)	< 0.001
Hyperlipidemia		72720 (26.7%)	885 (10.3%)	< 0.001
Obesity		36030 (13.2%)	790 (9.2%)	< 0.001
Peripheral vascular disease		16045 (5.9%)	265 (3.1%)	< 0.001
Prior MI		11700 (4.3%)	215 (2.5%)	< 0.001
Drug abuse		12050 (4.4%)	4040 (46.8%)	< 0.001
Tobacco Use Disorder		46285 (17.0%)	4135 (47.9%)	< 0.001
Chronic pulmonary disease		58130 (21.3%)	1650 (19.1%)	< 0.001
PriorTIA/Stroke		13780 (5.1%)	225 (2.6%)	< 0.001
Prior VTE		21605 (7.9%)	450 (5.2%)	< 0.001
Disposition of patient, Transfer Other: Includes Skilled Nursing Facility (SNF), Intermediate Care Facility (ICF), Another Type of Facility	Routine Transfers to short term hospital Transfer other Home Health Care	184890 (67.9%) 6090 (2.2%) 33780 (12.4%) 37290 (13.7%)	7110 (82.5%) 95 (1.1%) 415 (4.8%) 500 (5.8%)	< 0.001
Length of stay (days)	Median [IQR]	4 (2-6)	4 (2-6)	< 0.001
Total charges (USD)	Median [IQR]	32901	30936	< 0.001
Outcome	Adjusted Odds Ratio	95% CI		P value
		LL	UL	
MACCE	1.01	0.74	1.39	0.943
Intestinal obstruction	0.91	0.72	1.15	0.432
Colorectal Cancer	1.04	0.50	2.17	0.918
Colectomy	0.88	0.63	1.22	0.437
Acute Kidney Injury	0.90	0.76	1.08	0.262
Sepsis	0.61	0.39	0.94	0.024

P< 0.05 indicates statistical significance.
MACCE major adverse cardiovascular and cerebrovascular events - all cause mortality, acute MI, cardiac arrest, stroke
Multivariate regression models were adjusted for: Age, Sex, Race, Median household income quartile, payer status, type of admission hospital bed size, location, teaching status, hypertension, diabetes, dyslipidemia, obesity, PVD, Prior MI, Prior PCI, Prior CABG, drug abuse, smoking, Prior TIA/Stroke, Prior VTE

S993

De-escalation of Combination Drug Therapy in Inflammatory Bowel Disease Patients

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Introduction: There are limited data on the use of multiple biologics or small molecule drugs in combination to treat patients with inflammatory bowel disease and much less in methods for successful de-escalation of combination therapy. The aim of this study was to evaluate contributing factors to the decision to de-escalate, and successful de-escalation.
Methods: A retrospective cohort study was performed for IBD patients who were on combination (dual biologics or biologic + small molecule) therapy and underwent de-escalation. Data was collected at both the visit at which the decision to de-escalate was made and the next follow-up visit. Data collected included patient demographics, such as age, gender, BMI, albumin, CRP, ESR, and clinical scores. At the follow-up visit, patient compliance with the de-escalation plan, and the necessity to re-escalate therapy was evaluated.
Results: Patient characteristics are outlined in Table. The decision to de-escalate was made in patients (on average) with CRP, ESR, and albumin within normal limits. For the 25 patients that underwent de-escalation, 24 had a follow up visit. Of these patients, 71% were able to continue de-escalation with 29% requiring a re-escalation in therapy. 25% (N=6) were non-adherent with de-escalation for reasons such as insurance restrictions and incorrectly following de-escalation instructions. In one instance, a patient fully discontinued tofacitinib instead of taking the recommended taper dose. In another, the patient's insurance company stopped covering multiple biologics and one biologic was fully discontinued as a result. Patient adherence with de-escalation was significantly associated with the necessity for re-escalation at follow up visit (p=0.019). The type of de-escalation (taper of biologic, stop biologics, or taper small-molecule therapy) was not significantly associated with the necessity for re-escalation, albumin, ESR, CRP, or clinical scores of disease activity. As expected, the difference in clinical scores and inflammatory markers between initial visit and follow-up was not significant; although, UCAI, Mayo score, and ESR trended down.
Conclusion: In our retrospective cohort study, patient adherence was the most important predictive factor for successful de-escalation from combination therapy. Whether a biologic or small molecule was the agent being de-escalated did not appear to affect inflammatory levels at follow up. These findings might be limited by our sample size of 25 and thus additional studies are needed.

Table 1. Descriptive overview of patient data with decision to de-escalate and comparison of clinical scores and inflammatory markers at follow-up

	De-escalation Beginning		Follow-Up		
	Number of patients	Average	Number of patients	Average	p-value
Patient Age	25	37.38	-	-	-
Male	13	-	-	-	-
Female	12	-	-	-	-
BMI	23	23.5	-	-	-
Crohn's Disease	13	-	-	-	-
Ulcerative Colitis	11	-	-	-	-
Indeterminate Colitis	1	-	-	-	-
Disease Duration	25	15.24	-	-	-
HBI	11	3.59	11	3.72	ns
Mayo	11	2.09	9	0.78	ns
UCAI	7	3.26	5	0.4	ns
Albumin	20	4.11	17	4.11	ns
CRP	19	6.96	15	6.52	ns
ESR	19	14.94	15	9.6	ns
Biologic + Biologic	11	-	-	-	-
Biologic + SM	11	-	-	-	-
Biologic + Biologic + SM	3	-	-	-	-
Type of De-escalation					
Taper Biologic	11	-	-	-	-
Stop Biologic	8	-	-	-	-
Taper Small Molecule	7	-	-	-	-

ns = non-significant.

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Does Ethnicity Influence Mucosal Healing in Inflammatory Bowel Disease?

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Introduction: Crohn's disease (CD) and Ulcerative Colitis (UC), the two major forms of inflammatory bowel disease (IBD), are characterized by chronic inflammation of the gastrointestinal tract. Mucosal healing is a key therapeutic goal in patients with IBD, as it has been associated with reduced risk of relapse, decreased hospital admission rates, and lower rates of major abdominal surgery. The aim of this study was to investigate the percentage of patients that achieved mucosal healing within 18 months of initiation or adjustment of IBD therapy. Additionally, we stratified this analysis by patient ethnicity.
Methods: Retrospective analysis was performed on a group of adults (>18 years old) with an ICD-9/10 code diagnosis of IBD during their index hospitalization for IBD flare to a tertiary care center between January 1st 2013 to June 1st 2017. Patients who did not have initial inflammation, were lost to follow-up, or did not have subsequent cross-sectional imaging (XCI), colonoscopy, or biopsy were excluded. Mucosal healing was defined as resolution of inflammation seen on colonoscopy or XCI. Patients were followed-up within 18-months of initiation or adjustment of IBD therapy. Data including the patients' XCI and colonoscopy reports was extracted from the institution's integrated electronic data repository and electronic chart review.
Results: A total of 1,116 unique patients were analyzed of which 768 (547 CD, 211 UC, 10 mixed) met inclusion criteria. Of these 768 patients, 590 (76.8%) were Caucasian, 95 (12.4%) were African American and 34 (4.4%) were Hispanic. Two-hundred and seventy six patients received treatment between their initial and follow-up encounter. The treatment modalities are outlined in Table. One hundred and seventy six patients (158 CD, 17 UC, 1 indeterminate) had follow-up at 18-months. Of these 176 patients, 127 (72.2%) were Caucasian, 30 (17.0%) were African American and 14 (8.0%) were Hispanic. The follow-up cohort consisted of the characteristics outlined in Table. Mucosal healing was achieved in 84/176 (47.7%) of the total cohort. Mucosal healing was achieved in 63/128 (49.2%) Caucasians, 19/30 (63.3%) African Americans and 2/14 (14.3%) Hispanics (p< 0.0103).

Conclusion: Mucosal healing was achieved in 47.7% of patients within 18-months of initiation or adjustment of IBD therapy. Mucosal healing was achieved most frequently in African Americans compared to Caucasians and Hispanics. Further prospective studies are needed to validate these findings.

Table 1. Treatment modalities used by ethnicity

		Treatment Modality			
		Steroids	Biologic	Immunomodulator	Combination (Biologic + Immunomodulator)
Ethnicity	Caucasian	17 (7.8%)	52 (24.0%)	29 (13.4%)	119 (54.8%)
	African American	2 (5.3%)	7 (18.4%)	3 (7.9%)	26 (68.4%)
	Hispanic	1 (4.8%)	2 (9.5%)	4 (19.0%)	14 (66.7%)

S995

Comparative Trends in Admissions and Mortality in Inflammatory Bowel Disease Patients With Alcohol and Substance Abuse: A 10-Year Retrospective National Cohort Study

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Introduction: Recent data suggests that approximately 32 million Americans use illegal drugs. In addition, approximately 15 million Americans meet criteria for alcohol use disorder (AUD). Patients with chronic medical conditions, such as Inflammatory Bowel Disease (IBD), are more prone to have substance use disorder (SUD) or AUD and thus present a preventable strain on the healthcare system. Data suggests worse outcomes in IBD patients with AUD/SUD, however, no current studies assess trends in mortality, admission and healthcare costs for IBD patients with AUD/SUD.
Methods: We conducted a retrospective study using the National Inpatient Sample (NIS) database, to analyze alcohol and substance abuse (opioids, cocaine, and cannabis) among the IBD population from Jan 1, 2009, to Dec 31, 2019. Inclusion criteria included IBD patients, 18 years of age or older with a primary diagnosis of alcohol or substance abuse as defined by the International Classification of Diseases (ICD) 9 (before September 2015) and 10 (after October 2015) coding systems.
Results: A total of 132,894 IBD patients presented with AUD/SUD related hospitalizations for the study period. Of these patients, 75,172 (57%) were men and 57,696 (43%) were women. Length of stay (LOS) was higher in IBD patients with AUD/SUD compared to IBD patients without AUD/SUD ($P < 0.001$). There was an increasing trend in mean inpatient cost for IBD patients with AUD/SUD from $\$48,698.73 \pm 1374$ in 2009 to $\$62,672 \pm 1528$ in 2019 ($P < 0.001$). We report a 159.5% increase in hospitalizations of IBD patients with AUD/SUD, with the rate of hospitalizations increasing from 3,492 per 100,000 IBD patients in 2009 to 9,063 per 100,000 in 2019 ($P < 0.001$). In-hospital mortality for IBD patients with AUD/SUD increased by 129.6% (from 250 deaths per 100,000 IBD patients in 2009 to 574 deaths per 100,000 IBD patients in 2019) ($P < 0.001$).
Conclusion: Individuals with IBD are vulnerable to AUD/SUD due to the chronic nature of the disease. IBD patients with AUD are more prone to have flares and disease progression. Opioids do not improve abdominal pain or quality of life in IBD. Our study shows that from 2009-2019, there was a tremendous increase in hospitalizations of IBD patients with AUD/SUD. AUD/SUD in the IBD population led to longer LOS, higher healthcare utilization, costs and mortality. Therefore, it is crucial to identify IBD patients who may be at risk for AUD/SUD by screening for anxiety, depression, pain or other factors leading to an impaired quality of life.

Figure 3:

Rate of Occurrence of Alcohol or Substance Abuse Hospitalization and Associated Mortality Compared With Mortality for Non Alcohol or Substance Abuse Hospitalizations for IBD patients.

Bars show the rate per 100 000 total IBD hospitalizations . The blue line shows the mortality rate in primary alcohol or substance abuse hospitalizations per 100 000 IBD hospitalizations. The yellow line shows the comparative mortality rate in non Alcohol or substance abuse hospitalizations per 100 000 IBD hospitalizations.

[0995] **Figure 1.** Rate of occurrence of alcohol or substance abuse hospitalization and associated mortality compared with mortality for non alcohol or substance abuse hospitalizations for IBD patients

S996

Chasing the Common Variable Immunodeficiency Zebra: Endoscopic/Histopathologic Findings and Treatment

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Introduction: Common variable immunodeficiency (CVID) is a rare disease. Few studies have described endoscopic (endo) and histopathological (histo) findings or outlined effective treatment strategies. We aimed to characterize CVID presenting gastrointestinal (GI) symptoms, endo and histo findings, and real-world experience with treatment of patients with CVID with GI involvement.
Methods: This was a retrospective review of patients ≥ 16 years of age with diagnosis of CVID who underwent endo evaluation for GI symptoms at a major three site academic medical center. Patients with secondary CVID were excluded. Patients were identified by searching our institution's database using CVID, upper endoscopy and/or colonoscopy as key words. Procedures with indication of screening/surveillance were excluded. Demographics, clinical symptoms, endo and histo findings, and treatments were abstracted. Descriptive statistics were used to analyze the results.
Results: A total of 38 patients were included; 47% female, median age at CVID diagnosis was 31 years (range 4-66). A total of 100 procedures were included (Table). The most common GI symptoms leading to endo evaluation were diarrhea (45%) and abdominal pain (20%); other indication included nausea (17%), weight loss (14%), vomiting (10%), and rarely (< 10%): hematochezia/rectal bleeding, bloating, anorexia/early satiety, heartburn, dysphagia, iron and vitamin B12 deficiency. Endo and histo findings are described in Table. Patients were diagnosed with CVID enteropathy (CVIDe) (7), microscopic colitis (6), autoimmune enteropathy (1), CMV colitis (1), lichen planus (1), lymphocytic gastritis (2). Patients diagnosed with CVIDe were treated with budesonide (5), prednisone (1), mesalamine (1), vedolizumab (2), infliximab (2), ustekinumab (1), sirolimus (1) in addition to intravenous or subcutaneous immunoglobulin. One patient underwent bone marrow transplant for medically refractory disease.
Conclusion: Patients with CVID often experience GI manifestations, with CVIDe occurring in up to 15-20% of patients in the literature and 18% in our series. While endo and histo findings may be normal, biopsies are important as a range of histo findings can be found and this may impact treatment decisions. Although specific treatment guidelines are lacking, CVID patients with GI manifestations may require treatment with immunomodulators/biologics to improve morbidity and mortality.

Table 1. Endoscopic and histopathological findings

	Number of procedures n = 100 (%)
Type of procedure	
• EGD	48 (48)
• Colonoscopy	44 (44)
• Flexible sigmoidoscopy	7 (7)
• Lower DBE	1 (1)
EGD endoscopic findings (n=48)	
• Normal	22 (46)
• Esophagitis	2 (4)
• Gastric erythema and/or erosions	19 (40)
• Gastric atrophy	1 (2)
• Duodenal erythema	2 (4)
• Villous blunting	4 (8)
• Scalloping duodenum	4 (8)
• Nodular mucosa duodenum	1 (2)
• Ulcer duodenum	1 (2)
Colonoscopy/Flexible sigmoidoscopy/Lower DBE endoscopic findings (n=52)	
• Normal	29 (56)
• Nodular mucosa terminal ileum	1 (2)
• Atrophic mucosa terminal ileum	1 (2)
• Aphtha/erosion/ulcer terminal ileum	1 (2)
• Granularity terminal ileum	1 (2)
• Inflammatory changes in 1 or more colonic segments	11 (21)
• Pseudopolyps	1 (2)
EGD histopathology findings (n=48)	
• Normal	8 (17)
• Apoptosis	1 (2)
• Decreased/absent plasma cells	10 (21)
• Villous blunting	9 (19)
• Crypt distortion	2 (4)
• Lymphoid aggregates	1 (2)
• Prominent lymphoid follicle	1 (2)
• Increased intraepithelial lymphocytes (duodenum)	7 (13)
• Active duodenal inflammation	3 (6)
• Chronic duodenal inflammation (peptic and non-peptic)	7 (15)
• Increased eosinophils	5 (10)
• Reactive gastropathy	4 (8)
• Chronic gastritis	10 (21)
• Lymphocytic gastritis	2 (4)
• Multinucleated giant cells	1 (2)
• Increased epithelial lymphocytes esophagus	2 (4)
Colonoscopy/Flexible sigmoidoscopy/Lower DBE histopathological findings (n=52)	
• Normal	18 (35)
• Apoptosis	4 (8)
• Decreased/absent plasma cells	7 (13)
• Villous blunting terminal ileum	2 (4)
• Lymphoid aggregates	6 (12)
• Prominent lymphoid follicle	1 (2)
• Active ileitis	5 (10)
• Active colitis	5 (10)
• Active on chronic colitis	2 (4)
• Chronic colitis/crypt distortion	3 (6)
• Increased subepithelial collagenous band	4 (8)
• Increased intraepithelial lymphocytosis	5 (10)
• Pseudopolyp	1 (2)
• CMV	2 (4)*

EGD = upper endoscopy, DBE = double balloon enteroscopy, CMV = Cytomegalovirus
*Same patient was found to have CMV on biopsies twice

S997

Opioid Exposure in Hospitalized Patients With Inflammatory Bowel Disease, in a Community Setting

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Introduction: Patients with inflammatory bowel disease (Crohn's Disease and Ulcerative Colitis) commonly present to the hospital with disease flares,characterized by changes in stool habits with abdominal, pelvic, and extra-intestinal pain. It is well established that opioid use ininflammatory bowel disease patients is associated with increased rates of infections and increased mortality. Despite this, patients with IBD typically receive opiate therapy in increasing quantities during hospitalizations to treat their pain. We evaluated the degree of inpatient opiate use in IBD patients admitted in a community hospital setting to establish the degree of opportunity for quality improvement.
Methods: One hundred and twenty-five patient charts for individuals aged 18 or older admitted to Lankenau Medical Center from 10/1/2020 – 3/31/21 carrying a prior diagnosis of IBD on their problem list (ICD K50x and K51x) were retrospectively reviewed. The charts were analyzed for baseline demographic data and for opiate and non-opioid analgesics received throughout the admission. Opioid exposures were measured as proportions of intravenous morphine milligram equivalents (MME) per patient day. Hospital length of stay (LOS) was also assessed. Differences in baseline demographics and non-opioid analgesic use were analyzed between the groups of patients who received opiates and those who did not.
Results: Of the 125 patient charts reviewed, 90 patients (72%) received opioid analgesics during their hospitalization. The average length of stay for the opioid group was 4.2 days compared to 3.4 days in the non-opioid group ($p = 0.146$). The mean IV morphine equivalents per day for those who received opioids was 14.74. Celecoxib (23.3% vs 2.8%, p 0.005), gabapentin/pregabalin (40% vs. 20%, p 0.018) and ketorolac (55.5% vs. 2.8%, $p < 0.001$) use was significantly higher in the opioid cohort.
Conclusion: Patients with a prior diagnosis of inflammatory bowel disease who were hospitalized at our hospital in a community setting were associated with a high rate of opioid use. Those who received opioids while hospitalized were more likely to receive other non-opioid analgesics. Consequently, there is ample opportunity to limit opioid use and improve overall outcomes at our institution.

S998

Predictors and Outcomes of 90-Day Readmission in Inflammatory Bowel Disease Patients Admitted for Percutaneous Coronary Intervention

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Introduction: The outcome of patients with Inflammatory bowel disease (IBD) presenting with coronary artery disease (CAD) requiring percutaneous coronary intervention (PCI) has limited evidence in the literature. The aim of this study is to examine the predictors and outcomes of 90-day readmissions in IBD patients requiring PCI.
Methods: The International Classification of Diseases Code,10th Revision Clinical Modification (ICD-10) was used to identify patients who were hospitalized for PCI. Patients were identified from the Healthcare Cost and Utilization Project databases (HCUP) using the National readmission database (NRD) between 2016 and 2019. Patients were classified into 2 groups depending on whether they have IBD or not. Outcomes were all-cause and cause-specific 90-day readmissions and mortality rate during readmission. Multiple logistic regression model was used to identify the factors associated with readmission
Results: 1,851,473 patients underwent PCI between 2016 and 2019. 9295 (0.5%) patients had IBD. The mean age was 65.3 in patients with no IBD and 67.7 in patients with IBD. Total of 239105 readmissions were identified, 1522 (0.6%) were patients with IBD. The rate of admission for patients with IBD was 16.3% as compared to 12.9 % for patient without IBD ($p< 0.001$). Multivariate logistic regression was performed and showed OR of 1.31 (95% CI 1.18,1.455) ($P< 0.001$) for 90 days readmission for patients with IBD who underwent PCI as compared to those without IBD. Gastrointestinal bleed occurred in 7 % in patients readmitted who had IBD as compared to 3 % in patients without IBD, OR 1.89 (95% CI 1.57,2.27) ($P< 0.001$). Most important predictors of readmission were history of coronary artery disease (CAD), Congestive heart failure (CHF) and renal failure.
Conclusion: It appears that IBD is an independent risk factor for re-admission in patients undergoing PCI. Bleeding is a major cause of readmission which might be related to use of anticoagulation and antiplatelet agents in patients undergoing PCI. Further studies are needed to identify other possible causes of readmission and optimal means to control them.

S999

Social Determinants of Health in LGBTQIA+ Patients With Inflammatory Bowel Disease

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Introduction: Inflammatory bowel disease (IBD) is a group of chronic and relapsing disorders that cause inflammation in the gastrointestinal tract. With the increasing medical and economic burden of IBD, an adequate and expedited medical care is of utmost importance. The social determinants of heath ([SDOH]; e.g., social connections, depression) can influence up to 60% of a person's health and well-being, particularly in certain populations as LGBTQIA+. However, little is known about the SDOH in LGBTQIA+ patients with IBD.
Methods: We performed a cross-sectional study to determine the SDOH in LGBTQI+ patients with IBD. We included LGBTQIA+ patients (i.e., lesbian, gay, bisexual, transgender, queer, and intersex) from the electronical medical record (EMR) who were diagnosed with IBD between 1971-2022. We excluded patients that had no IBD-related EMR documented visits. The primary endpoint of the study was to assess the risk status of the SDOH. These data are calculated through information filled by hospital staff and patients through their healthcare application (i.e., MyChart).
Results: A total of 93 patients were included in the analysis (mean age 40.1 ±17.0 years; 91.4 White) (**Table**). In our cohort, 35 patients (37.6%) were socially/moderately isolated, 17 patients (18.3%) had medium/high risk of tobacco use, 9 patients (9.7%) had medium/high risk of depression, 35 patients (37.6%) were insufficiently or high risk of physical inactivity, 6 patients (6.5%) had unmet or medium risk of transportation needs, 10 patients (10.8%) had medium/high risk of dental needs, 11 patients (11.8%) had high risk of housing instability, 12 patients (12.9%) had medium/high risk of heavy alcohol drinking, 16 patients (17.2%) had medium/high financial strains, 34 patients (36.6%) had medium/high levels of stress, 8 patients (8.6%) had food insecurity, 39 patients (41.9%) had medium/high risk of not meeting nutritional needs, 1 patient (1.1%) had high risk of intimate partner violence, and 10 patients (10.8%) had medium/high risk of unemployment. Importantly, 37-63% of patients had unfilled/unknown data within each of the SDOH categories.
Conclusion: LGBTQIA+ patients with IBD are at a significant risk in several SDOH, resulting in health inequities. More effort is needed to obtain the SDOH in this population and better to understand their social/medical needs. Consequently, this will enhance obtaining appropriate resources to address these risks and disparities.

Table 1. Demographic information, sexual orientation, and gender identity

Demographic information	All patients
N	93
Age, years (SD)	40.1 (17)
Race, White (%)	85 (91)
Ethnicity, Not Hispanic/Latino (%)	88 (95)
Sex assigned at birth, Female (%)	59 (63)
Sexual orientation	
Bisexual (%)	48 (52)
Gay/Lesbian/Homosexual (%)	39 (42)
Prefer not to disclose (%)	1 (1)
Other (%)	5 (5)
Gender identity	
Female (%)	52 (56)
Male (%)	30 (32)
Genderqueer (%)	2 (2)
Transgender (%)	2 (2)
Other (%)	7 (8)

Data are presented as mean and standard deviation for continuous variables, and as frequency and percentage for categorical variables.

S1000

Differences in Work Disability by Race and Gender in Patients With Inflammatory Bowel Disease

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Introduction: Inflammatory bowel disease (IBD) is characterized by chronic, relapsing periods of intestinal inflammation with an unpredicTable clinical course. IBD flares may impact patients' quality of life (QOL), require frequent admissions, and contribute to missed work. Health and gender disparities have been shown to impact IBD's course. Crohn's Disease (CD) and Ulcerative Colitis (UC) are associated with high rates of emergency room (ER) visits and admissions. This study focused on elucidating differences in work disability by race and gender in IBD patients.

Methods: A cross-sectional study done at our tertiary referral center enrolled IBD patients on the day of their colonoscopy. Patients received surveys containing demographic, socioeconomic, quality of life, and work disability questionnaires. After scope completion, scores for endoscopic disease severity (EDS) were recorded. Statistics were analyzed using SPSS. A multiple logistic regression adjusted for sex, race, IBD diagnosis, clinical disease activity, and EDS when work missed due to health was evaluated. Via a retrospective approach, charts were reviewed for LTO: admissions, ER visits, steroid use, and surgeries one year post enrollment. Fisher's exact test was used to characterize data.
Results: A total of 86 patients, (51% F, 49% M, 74%W, 26%NW, 54% CD, 46% UC) were included in the study. Females had significantly more steroid use events than males (p=0.015) but no differences in work productivity. However, differences in ER visits, admissions, and surgeries between genders one year following enrollment were not significant. In terms of race, we found no difference in long term outcomes between whites and non-whites. However, non-white patients had 4 times the odds of having work missed due to health compared to whites(4.4;1.1-17.5). In Crohn's patients, the extent of endoscopic disease severity did not correlate to activity impairment, but it did in UC. Crohn's patients were 10 times more likely to miss work due to health than those with UC (10;1.2-84.0). In CD patients, endoscopic disease severity, but not clinical disease, was associated with missed work. (Table)
Conclusion: Understanding long term outcomes and health disparities is imperative for effective management of IBD patients. Our study suggests gender differences in long term outcomes of IBD, and race differences in missed work. However, additional studies are needed to further characterize the reasons and help improve patient's work and activity impairment.

Table 1. Logistic Regression Adjusted for Age, Sex, Race, IBD diagnosis, Clinical Disease Activity, and Endoscopic Disease Severity

Variable		No Work Absences due to Health	≥1 Work Absence due to Health	OR (95% CI)
Sex	Male	35 (92.1)	3 (7.9)	2.4 (0.6-10.1)
	Female	34 (82.9)	7 (17.1)	
Race	White	50 (92.6)	4 (7.4)	4.4 (1.1-17.5)*
	Non-White	17 (73.9)	6 (26.1)	
Diagnosis	CD	33 (78.6)	9 (21.4)	10.1 (1.2-84)*
	UC	37 (97.4)	1 (2.6)	
Age		41.8 ± 14.6	40.0 ± 14.4	1.0 (0.9-1.0)
HBI		4.5 ± 4.3	7.0 ± 4.7	1.1 (1.0-1.3)
SES-CD		5.9 ± 6.0	14.6 ± 5.7	1.2 (1.1-1.4)*

N (%) or mean ± standard deviation
*p< 0.05
Abbreviations: OR, odds ratio; CD, Crohn's disease; UC, Ulcerative Colitis; HBI, Harvey-Bradshaw Index; SES-CD, Simple Endoscopic Score for Crohn's Disease

S1001

Pattern of Dermatological Screening for Patients With Inflammatory Bowel Disease in Primary Care Clinics: A Tertiary Care Center Experience

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Introduction: Skin cancer is one of the most common forms of cancer in the United States of America. Incidence of melanoma in patients diagnosed with Inflammatory Bowel Disease (IBD) had a reported 37% increase in risk of melanoma when compared to the general population. It was seen that IBD was associated with an increased risk of melanoma, independent of biologic therapy. According to preventative care guidelines, patients with IBD should undergo screening for melanoma independent of the use of biologic therapy.
Methods: A random sample of patients were collected from a database within a tertiary care center. Patients were selected by having a confirmed diagnosis of Ulcerative Colitis (UC) or Crohn's Disease (CD) and having an established relationship with an internal medicine resident or non-teaching internist clinic. General demographics, referral to Dermatology and specific department from where the referral was placed were collected, along with relevant clinical information including current and previous therapies for IBD.
Results: A total of 109 patients met inclusion criteria. Of the 60 patients who were cared for at the resident teaching clinic, 14 were referred to dermatology. Referrals were mostly made by a consulting gastroenterologist (11 out of 14 referrals). Only 8 out of the 14 patients that were referred successfully followed through with a dermatology clinic. Of the 49 patients who were cared for at the non-teaching internist clinic, 8 were referred to dermatology, all of whom were referred by the consulting gastroenterologist. Six out of the 8 patients followed up with dermatology. In general, CD patients were significantly more likely to be referred to dermatology compared to UC patients (p< 0.05). Patients who are currently or were previously on biologic therapy were significantly more likely to be referred to dermatology compared to those who have no history of biologic use (p< 0.05).
Conclusion: Based on this descriptive study, overall screening for dermatological cancers in the IBD at-risk population is low despite their care being provided at a tertiary care center with access to consultants. This signifies gaps of care and low adherence to practice guidelines. The limitations need to be further studied as we speculate that the reason for low adherence could include deficiency in awareness of guidelines among primary care clinics, gastroenterologist reliance on primary care for general health maintenance, and insufficient patient education regarding the risks of skin cancer.

S1002

Association of Irritable Bowel Syndrome and Antibodies Against Endogenous Gonadotropin-releasing Hormone and Its Receptor. a Systematic Review and Meta-analysis

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Introduction: Irritable bowel syndrome (IBS) seems to have an unclear pathogenesis in the majority of patients. Antibodies against gonadotropin-releasing hormone (GnRH) have previously been discovered in the blood of these patients on a significant occurrence. This meta- analysis aims to assess if there is a significant association between GnRH antibodies and IBS.
Methods: We defined a search strategy and implemented it to the PubMed, Ovid, Scopus and Web of Science databases for English language publications. The data were evaluated for acceptability, and controlled studies, either clinical trials, case control, cross sectional or cohort studies reporting the prevalence of GnRH antibodies in IBS patients were included. RevMan software version 5.4 was used for performing the analysis.
Results: The total number of patients in the included studies was 1095 (270 patients in the IBS group, and 825 patients in the control group). By comparing IBS group and control group, we found a statistically significant association between IBS and increased prevalence of GnRH IgM antibodies (RR = 2.29, 95% CI = 1.58 to 3.31, p-value < 0.0001). No heterogeneity was observed among studies (P = 0.20, I^2 = 36%). In GnRH receptor IGM antibodies outcome, we found a statistically significant association between IBS and increased prevalence of GnRH IgM antibodies compared with controls (RR = 3.80, 95% CI = 1.72 to 8.38, p-value = 0.0010). No heterogeneity was observed among studies (P = 0.85, I^2 = 0%). For GnRH receptor IgM antibodies, the pooled analysis showed a statistically significant association between IBS and increased prevalence of GnRH receptor IgM antibodies compared with controls (RR = 3.80, 95% CI = 1.72 to 8.38, P = 0.0010). No heterogeneity was observed among studies (P = 0.17, I^2 = 44%).
Conclusion: This current meta-analysis revealed that GnRH IgM Antibodies may have an influence on the development of Irritable bowel syndrome, as Irritable bowel syndrome is related to a higher incidence of IgM antibodies against GnRH and its receptor when compared to healthy persons. More multicenter studies with higher sample sizes are needed to support our findings.

S1003

Safety of Ustekinumab in Patients 65 Years or Older With Inflammatory Bowel Disease: A Propensity-Based Match Analysis

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Introduction: Ustekinumab (UST) is a monoclonal antibody targeting both IL-12 and IL-23 receptors. Owing to its mechanism, there is always a concern for its adverse effects, including malignancy and opportunistic infections (OI). Our study aimed to study the risk of malignancy and OI in patients who were treated with UST and were 65 and older
Methods: A retrospective cohort study was conducted using TriNetX, a multi-institutional database of more than 70 million patients from 49 healthcare organizations in the USA. We compared the 3-year risk of malignancy and opportunistic infections (OIs) in patients with inflammatory bowel disease (IBD) who were treated with UST who were 65 years and older compared with patients between the age of 18-65 years. Exclusion criteria included patients who were on the biologic agent for less than 3 months or had a prior history of any adverse event. 1:1 propensity-score matching was performed, gender, race, ethnicity, diabetes, nicotine dependence, obesity, PO and IV steroids, mean Hb, CRP, albumin, and calprotectin within 1 year before medication initiation. Adjusted odds ratios (aOR) with 95% confidence interval (CI) were calculated to express the risk of each adverse event
Results: A total of 22,242 patients with IBD were identified who were 65 years or older. At the time of analysis, 147 patients received UST, 1,493 patients were on anti-TNF alpha (TNFi), 494 were on vedolizumab (VDZ), and 92 on tofacitinib, and 6040 patients were on a 5-ASA therapy. There was no difference in malignancy rates (OR: 0.58, 95% CI; 0.29-1.15) and OI (OR: 1.04, 95% CI; 0.50-2.1) in patients 65 years or older when treated with UST compared to 5-ASA therapy. There was also no difference seen in outcomes of malignancy and OI when UST was compared with other medications (TNFi, VDZ, tofacitinib) in the cohort
Conclusion: In conclusion, Ustekinumab appears safe to be used in patients with IBD who are 65 years or older

S1004

Adverse Events and Serological Responses Following SARS-CoV-2 Vaccination in Individuals With Inflammatory Bowel Disease

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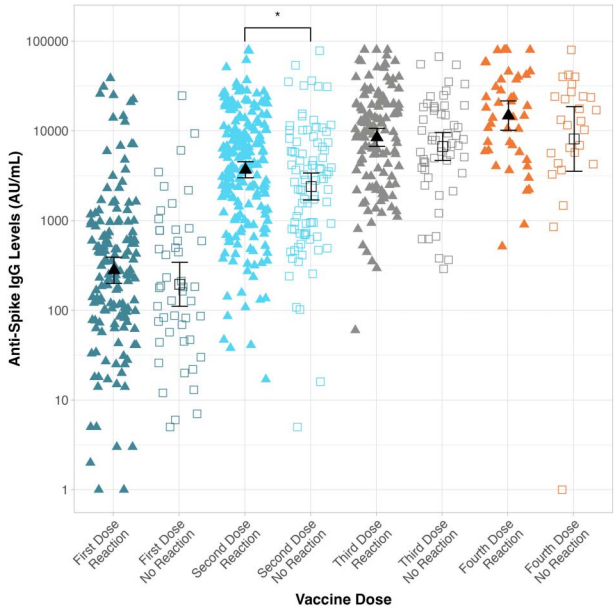
Introduction: The rapid development and distribution of SARS-CoV-2 vaccines has raised concerns surrounding vaccine safety in immunocompromised populations, such as those with inflammatory bowel disease (IBD). We described adverse events (AEs) following SARS-CoV-2 vaccination in those with IBD and to determine any relationship of AEs to post-vaccination antibody titres.
Methods: Individuals with IBD from a prospective cohort in Calgary, Canada who received a first, second, third, and/or fourth dose of a SARS-CoV-2 vaccine (Pfizer-BioNTech, Moderna, and/or AstraZeneca) were assessed for serological response and interviewed via telephone for AEs using questions based on the Adverse Events Following Immunization form. Subsequently, we used the Wilcoxon rank-sum test to analyze AEs and geometric mean titers (GMT). Interview and chart review were used to assess a flare of IBD within 30 days of vaccination.
Results: Table describes characteristics of individuals with IBD following the first dose (n=331), second dose (n=331), third dose (n=195), and fourth dose (n=100) of a SARS-CoV-2 vaccine. AEs were reported in 83.3% of participants after first dose, 79.1% following second dose, 77.4% following third dose, and 67.0% following fourth dose (Table). Injection site reaction (pain, redness, etc.) was the most common AE (50.8% of total AEs), with fatigue and malaise (18.1% of total AEs), headache and migraine (8.6% of total AEs), musculoskeletal discomfort (8.2% of total AEs), and fever and chills (6.5% of total AEs) also commonly reported. Only one participant was diagnosed with a severe AE requiring hospitalization: immune thrombocytopenic purpura (ITP) following their second dose of a Pfizer vaccine. No cases of IBD flare occurred within 30 days of a vaccine. Analysis found elevated GMT levels in those with injection site reactions compared to those without injection site reactions following all four doses, with second dose serological responses being statistically significantly different (8614/mL vs 6841 AU/mL [$p< 0.05$], respectively) (Figure).
Conclusion: AEs following SARS-CoV-2 vaccination are generally mild and become less common with each consecutive dose. Antibody titres may be higher for participants who report injection site reactions compared to those without injections site reactions after second dose. Vaccines did not appear to be associated with a flare of IBD within 30 days of vaccination.



[1004] **Figure 1.** Anti-SARS-CoV-2 spike antibody concentration across four doses of SARS-CoV-2 vaccine for participants who reported injection site reactions compared to participants who did not. * indicates statistical significant differences.

Table 1. Participant characteristics and adverse events following first, second, third, and fourth dose of a SARS-CoV-2 vaccine

Characteristics	Dose 1 (/331)	Dose 2 (/331)	Dose 3 (/195)	Dose 4 (/100)
Sex, n (%)				
Male	155 (46.8%)	155 (46.8%)	86 (44.1%)	49 (49.0%)
Female	176 (53.2%)	176 (53.2%)	109 (55.9%)	51 (51.0%)
Mean age (SD)	52.05 (14.52)	52.05 (14.52)	51.81 (15.20)	57.98 (14.01)
IBD Type, n (%)				
Crohn's Disease	238 (71.9%)	238 (71.9%)	150 (76.9%)	75 (75.0%)
Ulcerative Colitis & IBD-U	93 (28.1%)	93 (28.1%)	45 (23.1%)	25 (25.0%)
Medication, n (%)				
No immunosuppressives	33 (10.0%)	32 (9.7%)	14 (7.2%)	27 (27.0%)
Anti-TNF only†	118 (35.7%)	119 (36.0%)	74 (38.0%)	20 (20.0%)
Immunomodulators only	7 (2.1%)	7 (2.1%)	5 (2.6%)	< 5
Vedolizumab only	37 (11.2%)	39 (11.8%)	19 (9.7%)	9 (9.0%)
Ustekinumab only	76 (23.0%)	74 (22.4%)	42 (21.5%)	16 (16.0%)
Tofacitinib only	5 (1.5%)	5 (1.5%)	< 5	—
Combination therapy‡	49 (14.8%)	47 (14.2%)	36 (18.5%)	18 (18.0%)
Oral Corticosteroids	6 (1.8%)	8 (2.4%)	< 5	7 (7.0%)
Vaccine Type, n (%)				
Pfizer	271 (81.9%)	275 (83.1%)	179 (91.8%)	82 (82.0%)
Moderna	45 (13.6%)	49 (14.8%)	16 (8.2%)	18 (18.0%)
AstraZeneca	15 (4.5%)	7 (2.1%)	—	—
Adverse Events	Dose 1 (/331)	Dose 2 (/331)	Dose 3 (/195)	Dose 4 (/100)
Injection site, n (%)	250 (75.5%)	231 (70%)	138 (70.8%)	55 (55.0%)
Lymph node swelling, n (%)	1 (0.3%)	9 (2.7%)	14 (7.2%)	1 (1.0%)
Gastrointestinal, n (%)	17 (5.1%)	16 (4.8%)	6 (3.1%)	2 (2.0%)
Fatigue or malaise, n (%)	86 (26.0%)	87 (26.3%)	45 (23.1%)	22 (22.0%)
Fever or chills, n (%)	27 (8.2%)	35 (10.6%)	19 (9.7%)	5 (5.0%)
Musculoskeletal, n (%)	34 (10.3%)	41 (12.4%)	25 (12.8%)	9 (9.0%)
Headache or migraine, n (%)	34 (10.3%)	46 (13.9%)	23 (11.8%)	11 (11.0%)
Other, n (%)	16 (4.8%)α	14 (4.2%)β	7 (3.6%)γ	2 (2.0%)δ
Any symptoms, n (%)	275 (83.3%)	261 (79.1%)	151 (77.4%)	67 (67.0%)

†One of golimumab, adalimumab, or infliximab (originator or biosimilar) ‡Any combination of anti-TNF and one or more of the following therapies: vedolizumab, ustekinumab, tofacitinib, azathioprine, 6-mercaptopurine, or methotrexate αParesthesia, chin swelling, dysgeusia, numbness, hot flashes, irritability, ennui, hyperactivity, brain fog, congestion, dry eyes, sleep trouble, testicular swelling, angioedema, sinus swelling, throat swelling βShingles, hot flashes, brain fog, sleep troubles, rapid heartbeat, forced breathing, congestion, angioedema, throat swelling, leg swelling γHot flashes, brain fog, sleep troubles, sore throat, congestion, angioedema, ITP δParesthesia, sleep troubles

S1005

Inflammatory Bowel Disease and Ventricular Thrombus: A Systematic Review of Published Case Reports

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Introduction: Inflammatory bowel disease (IBD) causes hypercoagulability by the virtue of its autoimmune and inflammatory state. Studies with IBD and venous thromboembolism have been reported widely. Ventricular thrombi in the absence of cardiac pathology are rare. This paucity of data led us to perform a systematic review of case reports of ventricular thrombi in IBD patients.
Methods: A systematic literature search was performed using PubMed, Scopus, Embase and Google Scholar until June 2022 to identify cases of IBD complicated by ventricular thrombi. Data pertaining to patient demographics, clinical presentation, diagnostic interventions, treatments and outcomes were analyzed using descriptive analysis.
Results: 22 case reports consisting of 23 patients were included in this review predominantly consisting of females (61%) (mean age 32.9±10.6) and the majority were reported from the US. 61% had Ulcerative colitis and 35.8% had Crohn's disease. There was a predilection for left-sided ventricular thrombus formation when compared to the right (69.6% vs 26%). Patients with RV thrombus often had other associated systemic thrombosis compared to LV thrombosis. 65.22% had active disease at the time of thrombus diagnosis and 72.7% of total patients presented within 10 years of IBD diagnosis. Common treatments for IBD included Steroids (75%) and Mesalamine (41%). Diarrhea/bloody diarrhea was the most common presenting symptom (60.87%) and tachycardia was the most common presenting sign. Echocardiography was the principal diagnostic tool. 4/9 patients had T wave inversions and 4/5 patients showed troponin elevations. Elevated platelet count was seen in 75% of the patients and ESR, and CRP were elevated in 81.8% of them. Hypercoagulability workup was positive in 14.3% of the patients and drug abuse was reported in 2 patients. Concurrent thromboembolism was seen in 43.48% of patients. 3/4th of patients were treated with anticoagulation, and 1/4th of patients underwent surgical thrombectomy with or without anticoagulation. 83% of the patients experienced resolution and only 2 studies reported recurrent ventricular thrombi. (Table)
Conclusion: Patients with IBD are prone for thromboembolic disease given its hypercoagulable state and infrequently present with ventricular thrombi. Keeping a high index of suspicion for thromboembolic disease including cardiac thrombi especially in patients with active disease through echocardiographic screening would help in identifying and curbing complications early.

Table 1. Patient Characteristics - IBD and Ventricular thrombus

Author	Age (years)	Sex	Admitting history	Type of IBD	Disease status at the time of thrombus diagnosis	Right/left thrombus	Therapy after diagnosis
Kochar (2021)	38	M	Increasing abdominal pain, bloody diarrhea, shock	UC	Active	Left	Anticoagulation
Grewal (2021)	23	F	Persistent diarrhea, 3 weeks later weakness on right side of the body with aphasia	UC	Remission	Left	Surgical thrombectomy and anticoagulation
Abel (2020)	55	F	Bloody vaginal discharge, rectal pain	Not specified	Active	Right	Anticoagulation
Parollo (2020)	26	F	Diarrhea, abdominal pain	CD	Active	Right	Anticoagulation
Kakkar (2019)	40	F	Dyspnea, neuropathy in bilateral feet	CD	Remission	Right	Not Specified

Table 1. (*continued*)

Author	Age (years)	Sex	Admitting history	Type of IBD	Disease status at the time of thrombus diagnosis	Right/left thrombus	Therapy after diagnosis
Shankar (2019)	24	M	Right lower limb swelling, intermittent, colicky lower abdominal pain with increased frequency of stools, weight loss. PMH: acute-onset headache associated with dys-arthria, forgetfulness, inability to recognize faces 5 months ago	CD	Active	Right	Anticoagulation
Pokhrel (2018)	33	M	Pleuritic chest pain, dyspnea, fever	UC	Remission	Left	Anticoagulation
Muhling(2016)	18	F	Bloody diarrhea, accompanied by fever, malaise, neurologic symptoms- increasing headaches, double vision, and an unsteady gait	UC	Active	Right	Anticoagulation
Willner (2015)	21	F	Abdominal pain and diarrhea	UC	Active	Left	Anticoagulation
Rasalingam, 1 (2015)	42	F	Abdominal pain, diarrhea	CD	Active	Left	Thrombectomy
Rasalingam, 2 (2015)	18	M	chest heaviness, fevers, hypotension	CD	Remission	Left	Surgical thrombectomy
Ennezat (2013)	38	F	Shortness of breath	CD	Remission	Left	not specified
Koneru (2013)	28	F	Headache, fatigue,dizziness, vague constitutional symptoms	UC	Remission	Left	Anticoagulation
Iyer (2012)	40	M	exacerbation of Crohns disease symptoms and symtomatic ileal stricture	CD	Active	Left	Surgical embolectomy and anticoagulation
Kim (2012)	14	F	Dyspnea	UC	Remission	Left	Anticoagulation
Lameris (2011)	36	F	Bloody diarrhea, right-sided weakness	UC	Active	Right	Thrombectomy
Thatikonda (2011)	52	M	Confusion, multiple loose bowel movements	UC	Active	Left	Anticoagulation and Surgical thrombectomy
Springston (2010)	42	F	Abdominal pain, bloody diarrhea, fever, oral mucosal ulcers	CD	Active	Left	Anticoagulation
Saleh (2010)	39	M	Nausea, vomiting, abdominal pain, bloody diarrhea. On the second day of admission, transient episode of dysarthria, slurred speech, right mouth drooping, right-sided weakness	UC	Active	Left	Anticoagulation
Urgesi (2010)	38	F	abdominal pain, bloody diarrhea , PMH: weight loss in the last 3 months, increasing exertional dyspnea	UC	Active	Right	Anticoagulation
Lutz (2007)	34	M	Fever of unknown origin	UC	Remission	Left	Surgical thrombectomy
Mutlu (2002)	28	F	Chest pain for 24 h, passing five to seven bloody stools for 1 week	UC	Active	Left	Anticoagulation
Chin (1988)	30	M	Bloody diarrhea	UC	Active	Left	Anticoagulation, thrombectomy

S1006

Capsule Endoscopy in Inflammatory Bowel Disease: Differential Utility in Informing Medical Management When Used for Screening vs Follow-Up

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Introduction: Video capsule endoscopy (VCE) can be used both in both the initial diagnosis of inflammatory bowel disease (IBD) and to follow-up disease activity. Results of VCE can be used to guide medication management. The aim of this study is to assess differences in medication management when VCE is used for diagnosis of IBD vs follow-up of known disease.
Methods: We performed a retrospective review of VCE using a tertiary-care center's PillCam database from 8/3/2018-8/18/2021. Patients undergoing VCE for the evaluation and diagnosis of IBD were included. We then conducted chart review of these patients to investigate changes in medication management following VCE.
Results: A total of 83 patients were included in our study (56.6% female, average age 41.8 years [range 20-75 years]). Four patients had VCE performed 2 separate times, totaling 87 VCE reviewed. Twelve VCE were excluded from analysis due to being incomplete, poor quality, or patient was lost to follow up. Of the remaining VCE, 48 were performed in an attempt to diagnose IBD and 27 were performed to reassess disease activity in patients with known IBD. VCE showed findings of active Crohn's disease in 19/75 (25.3%) patients (9 diagnostic and 10 follow-up). Positive VCE resulted in medication changes in 9/9 diagnostic patients, as opposed to 5/10 follow up patients ($p=0.01$). The most common medication changes to the follow-up group included dose escalation of ustekinumab (2), initiation of ustekinumab (1), initiation of adalimumab (1), addition of azathioprine to ustekinumab (1). The most common medication changes to the diagnostic group included initiation of ustekinumab (2), initiation of mesalamine (2), initiation of corticosteroids (2), initiation of mesalamine + corticosteroid (1), initiation of adalimumab (1), increased dosage of corticosteroid (1).
Conclusion: VCE is an impactful tool used by clinicians to help guide medical management decisions in patients with IBD. Providers are significantly more likely to use VCE results to initiate medications following a positive capsule for diagnostic purposes when compared to a positive capsule to follow-up IBD activity. In the follow-up disease activity group, there may have been lower rates of new therapy initiation in favor of optimizing current medications. Further study in a larger cohort of patients would be important to confirm these findings.

S1007

Decreased Odds of Hospitalization for Octogenarian Patients With IBD

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Introduction: Incidence of inflammatory bowel disease (IBD) decreases after the second incidence peak of patients aged 50-70 years. Patients over 80 years represent 10% of the IBD patient population. Disease course for elderly patients in both ulcerative colitis (UC) and Crohn's disease (CD) has been noted to be milder, with less bleeding, less progression to penetrating disease and less occurrence of extraintestinal manifestations. Inpatient outcomes in this patient cohort have not yet been thoroughly explored. The aim of this study was to examine inpatient outcomes in octogenarian patients admitted for IBD using a national database.
Methods: Retrospective, observational study using the National Inpatient Sample (NIS) 2018. All patients with principal ICD10CM codes for IBD were included. The cohort was divided into two age groups: >80 years old and < 80 years old. The cohort was further substratified into UC and CD. Primary outcome was determining the occurrence and odds of admission for IBD in octogenarian patients compared to

patients younger than 80 years. Secondary outcomes included inpatient morbidity, mortality, colectomy odds, hospital length of stay (LOS), and total hospital costs and charges. Multivariate regression analyses were used to adjust for confounding variables.

Results: A total of 99,530 patient admissions for IBD were included in the study (39% UC). Of these, 4,245 (4.27%) were >80y/o (63% UC). The mean age in the octogenarian cohort was 84.7 years and 68% were female. A greater proportion of Caucasian octogenarians were noted compared to the cohort younger than 80 years (84.55% vs 71.54%, respectively). Octogenarian patients with IBD were noted to have lower odds of admission (aOR:0.32, p< 0.01), compared to non-octogenarian patients with IBD. Octogenarian patients with IBD displayed lower odds of colectomy, while octogenarian patients with CD had lower odds of ICU admission compared to non-octogenarian patients. There were no differences in resource utilization noted between the two cohorts (Table).

Conclusion: Octogenarians admitted for IBD primarily had a diagnosis of UC and 68% were female. As suggested by prior studies noting a lesser disease severity in this age group, octogenarians displayed decreased odds of admission for IBD, as well as decreased odds of ICU admission compared to non-octogenarian patients with IBD. Future studies should focus on directly assessing disease severity in this patient cohort to better understand its relationship with inpatient outcomes.

Table 1. Adjusted Odds Ratios and Means for Octogenarian Patients with IBD Compared to Non-Octogenarian Patients with IBD

	Adjusted Odds Ratio	95% Confidence Interval	p-value
IBD Admission	0.32	0.30-0.35	< 0.01
Crohn's Disease	0.20	0.18-0.23	< 0.01
Ulcerative Colitis	0.47	0.43-0.52	< 0.01
Mortality	0.75	0.34-1.68	0.49
Crohn's Disease	0.43	0.11-1.71	0.23
Ulcerative Colitis	1.21	0.42-3.49	0.72
Shock	0.55	0.29-1.03	0.06
Crohn's Disease	0.39	0.14-1.12	0.08
Ulcerative Colitis	0.74	0.33-1.68	0.47
AKI	0.84	0.68-1.05	0.13
Crohn's Disease	0.54	0.60-1.16	0.29
Ulcerative Colitis	0.88	0.65-1.18	0.38
ICU	0.43	0.23-0.80	< 0.01
Crohn's Disease	0.41	0.17-0.98	0.05
Ulcerative Colitis	0.50	0.51-1.22	0.13
SIRS	0.68	0.33-1.39	0.29
Crohn's Disease	0.19	0.02-1.43	0.11
Ulcerative Colitis	1.01	0.45-2.30	0.98
Multiorgan Failure	0.89	0.72-1.10	0.30
Crohn's Disease	0.79	0.57-1.10	0.16
Ulcerative Colitis	1.01	0.76-1.33	0.96
Colectomy	0.30	0.18-0.48	< 0.01
Crohn's Disease	0.08	0.02-0.34	< 0.01
Ulcerative Colitis	0.42	0.24-0.73	< 0.01
	Non-Octogenarians	Octogenarians	p-value
Mean Costs (USD$)	$12,153	$11,329	0.94
Crohn's Disease	$11,731	$10,496	0.44
Ulcerative Colitis	$12,849	$11,814	0.64
Mean Charges (USD$)	$49,549	$48,446	0.63
Crohn's Disease	$47,617	$45,901	0.58
Ulcerative Colitis	$52,734	$49,927	0.76
Mean LOS (days)	5.0	5.6	0.13
Crohn's Disease	4.9	5.3	0.73
Ulcerative Colitis	5.1	5.8	0.09

IBD - Inflammatory Bowel Disease, AKI - Acute Kidney Injury, ICU - Intensive Care Unit, SIRS - Systemic Inflammatory Response Syndrome, LOS - Length of Stay.

S1008

Inflammatory Bowel Disease and Malignancies – A Multi-Centric Retrospective Analysis

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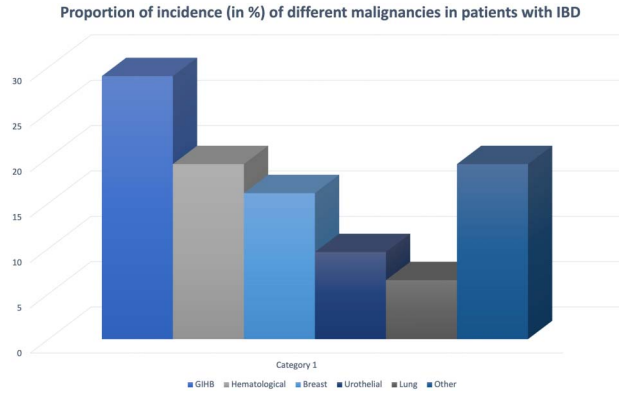
Introduction: Inflammatory Bowel Disease (IBD) has been long known to cause gastrointestinal (GI) malignancies, especially colorectal cancer. However, with the advent of immunomodulating agents resulting in increased longevity, the duration of both inflammation and immunosuppression has increased. This has given rise to a higher incidence of extra-GI malignancies that have been lesser studied.

Methods: A retrospective chart review of 259 randomly selected patients with IBD over the last 5 years was performed. Patients who were diagnosed with cancer in the last 5 years (2017-2022) were identified. Data regarding baseline characteristics and sites and types of cancer were collected. The cancers were further classified into GI and extra-GI. Descriptive statistics were used to analyze the incidence of cancer and the percentage of patients with GI and extra-GI cancer.

Results: The lifetime incidence of cancer in the studied 259 patients was 12% (31) of which 29% (9) had gastrointestinal and hepatobiliary cancers (GIHB) including 3 colorectal cancers (CRC). 71% (22) had extra-gastrointestinal malignancies with hematological malignancies accounting for 19.3% (6) and breast cancers accounting for 16.1% (5). The average age of the population studied was 53 ± 15.1 years while the average age of the patients with cancer was 60.9 ± 13.2 years. Of them, 64.3% (18) were women and 35.7% (10) were men compared to 62.5% women and 37.5% men in the study population. 71.4% (20) were Caucasian, 25% (7) were African American, and 3.6% (1) were Pacific-islander.

Conclusion: Patients with IBD and malignancies represent a challenging population. Underlying chronic inflammation as well as immunomodulating therapy, both increase the risk of cancer. While GIHB, especially colorectal cancers, have been long studied to have distinct molecular pathogenesis in the setting of IBD, there is a paucity of data regarding extra-GIHB cancers. Moreover, the management of cancer may halt the treatment of IBD causing disease progression. While the data on the risk of cancer in IBD is increasing, truly little is known about the effects of cancer treatment on IBD and the effect of IBD and its treatments on cancer outcomes.



[1008] **Figure 1.** Proportion of incidence (in % patients) of different malignancies in patients with IBD

S1009

Identifying Barriers to COVID-19 Vaccination in U.S. Veterans Who Have Inflammatory Bowel Disease

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Introduction: The COVID-19 pandemic has caused millions of deaths and infections worldwide. Patients with multiple medical comorbidities are more vulnerable. Veterans have more health conditions than the general population with higher prevalence of HTN, DM, and lung disease. Veterans with IBD are predisposed to COVID-19 and have higher rates of associated hospitalizations and mortality. COVID-19 vaccination rates in IBD patients in community settings is 41%, lower than the general population and WHO recommendations. The 2020 veteran mortality rate rose to an all-time high, with a 13% increase or 50,299 excess deaths). We examined the rates of and barriers to COVID-19 vaccination in the veteran population with IBD.
Methods: We conducted a retrospective cross-sectional study at a VAMC. Data for demographics, subtype of IBD (i.e., ulcerative colitis or Crohn's disease), and biologic therapy were collected. Unvaccinated veterans completed a 15-item survey of 4 structural barriers and 11 attitudinal barriers to vaccination via a phone call.
Results: We identified 206 veterans with IBD, 34 (16.5%) of whom were not vaccinated. Mean age for the vaccinated was 66 years and for the unvaccinated 54 years ($p < 0.001$). The two groups did not differ on sex (male 95% and 91%), race (Caucasian 86% and 87%), type of IBD (UC 63% and 55%), and biologic therapy (37% and 35%). The leading structural barrier was primary care provider or GI physician did not provide enough information about the vaccine(41%). The leading attitudinal barriers were (1) not agree that the government mandates were appropriate (91%) and (2) afraid of vaccinations (62%).
Conclusion: The 83.5% COVID-19 vaccination rate for IBD patients was higher than the general population rate of 66%.1 Lack of provider counseling, disagree with government mandates, and fear of vaccines were major barriers. Due to their comorbidities and immunologic suppression from treatment, gastroenterologists managing IBD patients should discuss COVID-19 immunization including the importance of being immunized, fear of vaccines, and possible side effects. Vaccine hesitancy must be targeted locally and nationally, with compassion and empathy. Our findings can be applied to future pandemics and global health policies and be the basis for studies of psychosocial components that impact veterans' compliance with vaccinations.

S1010

Importance of Bifidobacteria in Crohn's Disease

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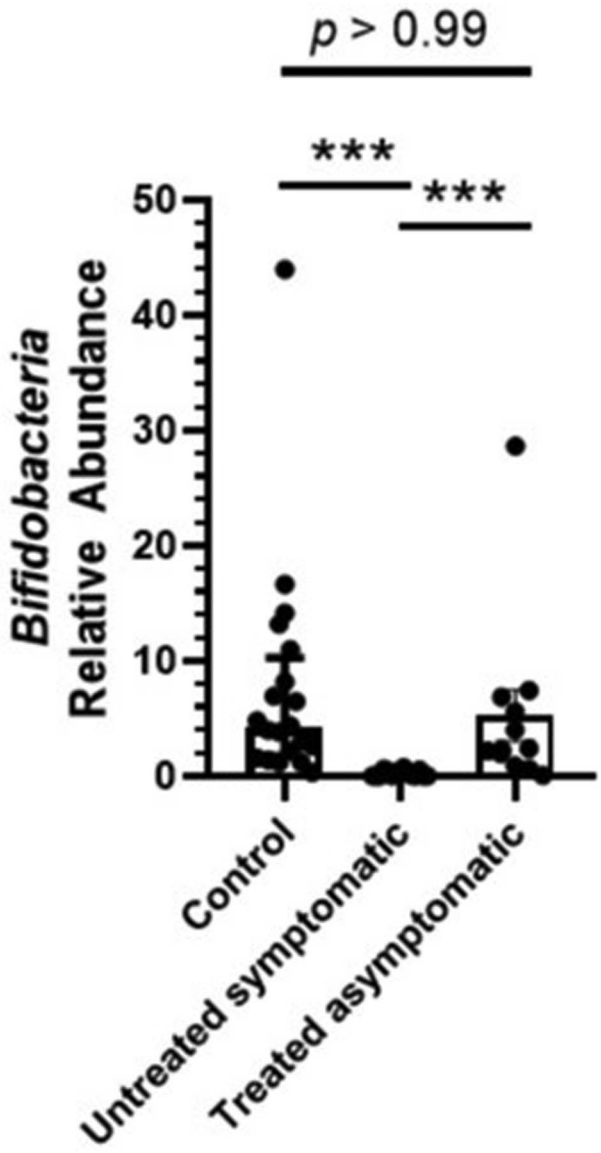
Introduction: Crohn's disease is an inflammatory bowel disease thought to be multifactorial in etiology from microbiome disruption to infectious process to genetics. The prevalence of Crohn's is around 180/100,000 in 2016 and healthcare burden in the billions of dollars. Studies by Bozkurt et al. showed that intracolonic administration of certain *bifidobacteria* species resolved inflammatory bowel disease symptoms and improved mucosal healing. Studies by Paramsothy, Borody and colleagues on fecal transplant showed improved outcomes in ulcerative colitis compared to placebo. In view of these potential breakthrough therapies, we sought to investigate the relative abundance of genus *bifidobacterium* in patients virgin to treatment compared to patients in treatment compared to healthy controls.
Methods: We determined Relative Abundance of *bifidobacteria* in two groups of Crohn's patients: treated asymptomatic vs untreated symptomatic, compared to healthy controls. Medications included Humira, Stelara, Remicade, Methotrexate, Enteragam, prednisone, low dose naltrexone, Entevio). No patients in all three groups were on probiotics prior to stool collection. Metagenomic Next Generation Sequencing was performed on fecal samples, where DNA samples were extracted and normalized for library downstream analysis using Shotgun Methodology. The Kruskal-Wallis test was used for comparison. This study was IRB approved.
Results: Relative Abundance of Bifidobacterium levels significantly decreased in untreated symptomatic Crohn's patients vs. control ($p < 0.0001$) and in untreated symptomatic vs. treated asymptomatic ($p = 0.0006$). No significant difference was observed between medicated asymptomatic vs. healthy control ($p > 0.999$). Median, interquartile range and sample size of groups were: control (4.18%, 1.72-10.27%, $n = 20$), untreated (0.05%, 0.00-0.46%, $n=12$) and treated (2.35%, 1.16-6.53%, $n=15$). These results were highly significant despite small sample sizes. (Figure)
Conclusion: This is the first study to explore the role of monitoring the relative abundance of *bifidobacteria* in assessing treatment success in Crohn's patients. Although a small study, it does show hope for therapies that predominantly focus on implantation of the species of *Bifidobacteria* or whole stool as part of Crohn's therapy.



[1010] **Figure 1.** Genus Bifidobacteria decreases in abundance in untreated symptomatic Crohn's patients, but is restored in treated asymptomatic patients, compared with controls.

S1011

Inflammatory Bowel Disease Patients Commonly but Inconsistently Change Diet for Flares

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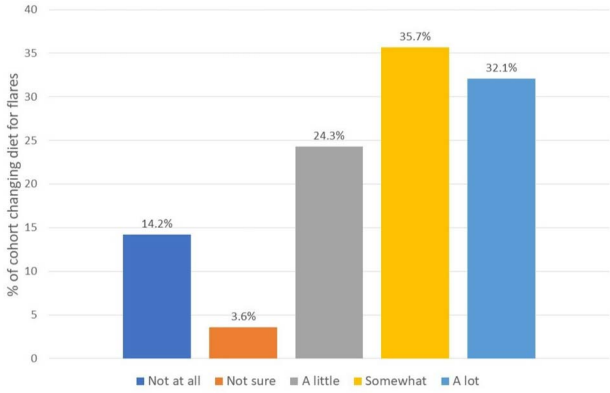
Introduction: Of growing interest for patients and physicians is understanding the impact of diet on IBD symptoms. Changing diet may alter environmental exposure, modulate the microbiome, and improve gut barrier permeability. Despite ongoing research, the optimal dietary changes during times of flares remain uncertain. We aimed to better understand the current dietary intake of our IBD patients and the relationship between diet changes and disease activity.
Methods: A prospective, multi-center, cross-sectional study of eating habits and preferences was performed in a cohort of IBD patients at two academic gastroenterology practices. The Automated Self-Administered 24-hour diet recall tool and Fat and Fiber Behavior Questionnaire were used to estimate daily nutrient intake. Healthy Eating Index-2015(HEI), a measure of diet quality used to assess how well a set of foods aligns with key recommendations of the Dietary Guidelines for Americans scored 0-100 like a school grade, was calculated. Disease activity was assessed using the Harvey Bradshaw Index (Crohn's disease) and Simple Clinical Colitis Activity Index (UC).
Results: In this prelim analysis, 28 patients (18 Crohn's, 8 UC, 2 IBDU) completed all study surveys. The overall cohort consumed an avg daily diet with a HEI of 53.5 (an "F"), 2023 kcal, 19% protein, 36% fat, 46% carbohydrates with 20g of fiber, 0.7 cup equivalents of fruit, 2.1 cup equivalents of vegeTables, 9.8g added sugars. On questioning, a majority of patients (92%) reported that they change their diets during flares (Figure). To better understand these changes, we compared nutrient intake between patents with active versus inactive disease based on activity indices. We found no significant differences between the groups in regard to intake though there was a modest trend towards lower vegeTable intake and lower fiber intake in those with more disease activity (Table).
Conclusion: Based on the average HEI, our cohort is eating a diet that fails to meet key dietary guidelines, although not dissimilar to the average American, mean score 57. Interestingly, while a majority report they change their diet with flare symptoms, we did not find significant differences between dietary components in those with and without active disease. We speculate that patients make varied changes in diet during flares that are not able to be detected between the groups as a whole. High quality evidence to guide recommendations for dietary changes during flares is needed.



[1011] **Figure 1.** A majority of patients report that they change their diet for flare-ups of their IBD.

Table 1. Analysis of diet intake between patients with active and inactive disease (based on HBI or SCCAI)

Dietary Component	Inactive disease (n=21)	Active disease (n=7)	*p*-value
Healthy Eating Index – 2015 Score	53.5 ± 16.0	53.4 ± 19.3	.99
Self-reported diet changes with flare (Likert scale 1-5, 1=no change, 5=a lot of change)	3.4 ± 1.5	4 ± 1.4	.38
Total Calories (kcal)	2126 ± 1062	1715 ± 764	.47
FATS			
Total Fat (g)	88.0 ± 59.2	72.5 ± 44.0	.64
Monounsaturated fat (g)	31.6 ± 22.4	24.5 ± 14.2	.60
Polyunsaturated fat (g)	22.3 ± 15.3	21.9 ± 16.1	.64
Saturated fat (g)	26.0 ± 20.9	20.7 ± 12.7	.76
Omega-3 (EPA/DHA) (g)	0.035 ± .029	.144 ± .224	.89
CARBOHYDRATES (g)	237.5 ± 117.1	196.2 ± 89.0	.27
Added sugar (tsp. eq.)	9.6 ± 9.6	10.5 ± 11.4	.92
FIBER			
Total fiber (g)	22.4 ± 15.5	12.6 ± 5.1	.16
Total fruit (cup eq.)	.65 ± .93	.83 ± .61	.48
Total veggie (cup eq.)	2.4 ± 1.8	1.3 ± 1.0	.14
TOTAL PROTEIN (g)	99.2 ± 56.7	73.5 ± 33.0	.32
Red meat intake*	3.6 ± 0.7	3.9 ± 0.7	.56
PROCESSING			
Processed meats*	4.1 ± 0.9	3.9 ± 0.7	.45
Fast Foods*	3.9 ± 0.9	3.6 ± 0.5	.38

* Data from Fat and Fiber Behavior Questionnaire (FFBQ), scored 1-5, lower = higher consumption

S1012

Significant Racial/Ethnic Differences Exist in the Receipt of IBD-Related Surgery: A Systematic Review and Meta-Analysis

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Introduction: Patients with inflammatory bowel disease (IBD) may require surgical intervention for management of their disease. There is a rising incidence of IBD in racial and ethnic minorities but studies regarding healthcare utilization patterns in these populations have yielded variable results. We aimed to examine the differences in surgical rates of ethnic and racial groups compared to White patients with IBD.
Methods: Electronic databases were searched through December 20, 2021. Studies that compared ulcerative colitis (UC) or Crohn's disease (CD) surgery rates between different racial/ethnic groups were included. Both pediatric and adult studies were included. Pooled event rates were generated and p-value < 0.05 was considered statistically significant in generating odds ratios (OR) with 95% confidence interval (CI). We also compared differences in disease location, phenotype, and IBD-medication exposure amongst different groups included.
Results: Forty-one studies stratified rates of IBD-related surgeries by race or ethnicity (n=1,094,693 patients). Black patients were less likely to undergo IBD-related surgeries compared to White patients (pooled OR 0.70, 95% CI, 0.55-0.89, I2=87.0%). Black patients were also less likely compared to White patients to undergo an emergent colectomy with an incidence rate ratio of 0.43 (95% CI, 0.32-0.58). Furthermore, Hispanic patients were less likely to undergo a CD-related surgery (pooled OR 0.57, 95% CI, 0.48-0.68, I2=0%) compared to White patients. Finally, Asian patients had no significant difference in likelihood of CD-related and UC-related surgeries compared to White patients. Black patients were more likely to have perianal disease (pooled OR 1.40, 95% CI, 1.06-1.86), I2=58.2%) but otherwise disease characteristics and phenotypes were similar across all populations compared to Caucasians.
Conclusion: Black and Hispanic patients with IBD are less likely to have surgery, including emergent surgery, for IBD compared to White patients with IBD, despite similar disease phenotype characteristics. Disparities in access to care may be contributory toward these findings and efforts should be made to provide equiTable care to all persons living with IBD, regardless of race and ethnicity.

S1013

Use of IBD Endoscopic Scoring Systems in Practice

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Introduction: Inflammatory bowel disease (IBD) treatment targets include mucosal healing based on standardized endoscopic scoring systems. The rates and ease of use of these scoring systems in practice have not been well described. We aimed to assess the rates and potential barriers to using IBD endoscopic scoring systems in practice from IBD Live attendees.
Methods: IBD LIVE is an international case-based conference focusing on the management of patients with IBD. We created a web-based survey consisting of 38 questions on the frequency and ease of use of various IBD endoscopic scores. This survey was emailed to the IBD LIVE listserv in March 2022 with a second email sent 14 days later. We included only respondents who are currently performing endoscopy. Continuous variables were analyzed using an unpaired student's t-test. Categorical variables were analyzed using a Pearson's chi-square test.
Results: There were 65 responses out of 170 (38.2% response rate) regular attendees. Eleven responses were excluded (4 with no response on the use of endoscopy scores, 7 were not performing endoscopy). Of the respondents, 72.2% are from the US, 70.4% are adult gastroenterologists, 53.9% in academic practice, and 40.7% in practice for ≥ 15 years. Of the endoscopy scores used ≥ 50% of the time, 74.1% were using the Mayo Endoscopic Sub-score (MES), 72.3% using the Rutgeert's Score, 61.2% using the Simple Endoscopic Score for Crohn's Disease, and 28.6% using the Pouchitis Disease Activity Index. Attending IBD Live ≥ monthly (p=0.028), attending an IBD conference ≥ every 2 years (p=0.020), and having the scoring system incorporated into the endoscopy documentation software (p=0.002) were associated with more consistent use of the MES. Attending IBD Live ≥ monthly (p=0.026), having an IBD volume of ≥ 50% (p=0.011), and attending an IBD conference ≥ every 2 years (p=0.004) was associated with more frequent use of the Rutgeert's score. There were no factors that increased the use of other endoscopic scores. (Table)
Conclusion: The MES and the Rutgeert's score are more commonly used with much lower rates of use of endoscopic scores for Crohn's disease and pouchitis. The use of these endoscopy scores is more common among those who regularly attend IBD conferences, have higher volume IBD practices and have these scoring systems incorporated into endoscopy software. Further evaluation of ways to improve utilization of endoscopic scoring for Crohn's disease and pouchitis are needed.

Table 1. Results

Use of Mayo UC Endoscopic Subscore	≥50% of the time (n=40), n (%)	< 50% of the time (n=14), n (%)	p-value
Endoscopic Score Built into Software	27 (67.5)	3 (21.4)	**0.002**
Attend IBD Conference ≥ every 2 Years	39 (97.5)	11 (78.6)	**0.020**
Attend IBD Live: At least monthly Less than monthly	30 (75) 10 (25)	6 (42.9) 8 (57.1)	**0.028**
Number of years in GI Practice: < 10 years ≥ 10 years	18 (45) 22 (55)	5 (35.7) 9 (64.3)	0.55
Specialty: Adult GI Pediatric GI Colorectal Surgery Other	32(84.2) 4 (80) 4 (80) 0	6(15.8) 1(20) 6(60) 1(100)	**0.012**
Use of the Rutgeert's Score	≥50% of the time (n=34), n (%)	< 50% of the time (n=13), n (%)	p-value
Endoscopic Score Built into Software	17 (50)	3 (23.1)	0.45
Attend IBD Conference ≥ Every 2 Years	34 (100)	10 (76.9)	**0.004**
IBD patient volume ≥50%	22 (64.7)	3 (23.1)	**0.011**
Attend IBD Live: At least monthly Less than monthly	23(76.7) 7(23.3)	6(46.2) 7(53.8)	**0.026**
Number of years in GI Practice: < 10 years ≥ 10 years	14(41.2) 20(58.8)	4(30.8) 9(69.2)	0.51
Specialty: Adult GI Pediatric GI Colorectal Surgery	27 (79.4) 3(8.8) 4(11.8)	7(53.9) 2(15.4) 4(30.8)	0.19
Use of Simple Endoscopic Score for Crohn's Disease	≥50% of the time (n=30), n (%)	< 50% of the time (n=19), n (%)	p-value
Endoscopic Score Built into Software	18 (60)	6 (31.6)	0.09
Attend IBD Conference ≥ Every 2 Years	29 (96.7)	16 (84.2)	0.12
IBD patient volume ≥50%	17 (56.7)	8 (42.1)	0.32
Attend IBD Live: At least monthly Less than monthly	23(76.7) 7(23.3)	11(57.9) 8(42.1)	0.16
Number of years in GI Practice: < 10 years ≥ 10 years	15(50) 15(50)	5(26.3) 14(73.7)	0.10
Specialty: Adult GI Pediatric GI Colorectal Surgery	24(68.6) 2(40) 4(44.4)	11(31.4) 3(60) 5(55.6)	0.25

S1014

Immune Checkpoint Inhibitors for Colorectal Cancer in Patients With Inflammatory Bowel Disease

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Introduction: Immune checkpoint inhibitors (ICIs) have revolutionized the management of many types of malignancies, including microsatellite instability high (MSI-H) colorectal cancers (CRC), but pose a unique challenge to patients with underlying inflammatory disorders such as inflammatory bowel disease (IBD). The safety and efficacy of ICI therapy for CRC in patients with underlying IBD has not been described.
Methods: We queried the electronic health database for patients with IBD and CRC who were treated with ICI at tertiary care cancer center in New York City. We collected demographic data, IBD and cancer history, and outcomes of both IBD and CRC after treatment with ICIs.
Results: Four patients with underlying IBD were treated with ICIs for MSI-H colorectal cancer (Table). All patients had long-standing IBD for greater than 20 years. Two of the patients were diagnosed with concomitant Lynch syndrome at the time of MSI-H cancer diagnosis. No patients were on active IBD therapies at the time of ICI initiation. All four patients were treated with anti-PD-1 therapy (Pembrolizumab) for stage 3 (n=2) or stage 4 (n=2) CRC. All four patients had robust cancer responses to ICI, three with partial responses and one with a complete response over a median follow-up time of 34 months. One patient with locally advanced rectal cancer had a complete response and has avoided the need for surgical resection and permanent stoma.Three patients had a flare of IBD while on ICI requiring

initiation of 5-ASA (n=2) or immunosuppressive therapy (n=1) (Table). One patient required hospitalization for IBD flare. ICI therapy was held due to IBD flare for two patients who had already achieved significant response to ICI with stable disease.

Conclusion: In this small series of patients with IBD and MSI-H colorectal cancer, treatment with ICIs was effective at achieving cancer response in all patients while IBD flares were common but manageable with standard medical therapy. Larger studies are needed to explore the safety and efficacy of ICIs for CRC in patients with IBD.

Table 1. Baseline Characteristics and Outcomes of CRC and IBD after ICI Therapy

Patient	Age of ICI Initiation & IBD type	IBD Duration (years) & Prior IBD Medications	Lynch Syndrome	Cancer Stage	ICI Type & Doses of ICI	Treatment for IBD Flare	Best overall Cancer Response to ICI	Surgery for CRC
1	51, Crohn's	38; SSZ, CS, IFX	No	IV	PD- 1, 33	Prednisone, Adalimumab, Ustekinumab	Partial Response	Subtotal colectomy (before ICI)
2	50, Crohn's	23; 6-MP	No	IV	PD- 1, 10	N/A	Partial Response	Total proctocolectomy with end ileostomy (before ICI)
3	35, UC	22; 5-ASA	Yes	III	PD- 1, 33	5-ASA	Complete Response	None
4	34, UC	22; 5-ASA, CS,AZA	Yes	III	PD- 1, 4	5-ASA	Partial Response	Total proctocolectomy with ileoanal anastomosis (after ICI)

ADA: adalimumab, AZA: azathioprine; CRC- Colorectal Cancer; CS: corticosteroids; CTCAE: Common Terminology Criteria for Adverse Events, IBD: inflammatory bowel disease, ICI: immune checkpoint inhibitor; IFX: infliximab; PD-1: Programmed Death 1; SSZ: sulfasalazine; 5-ASA: 5-aminosalicylate; 6- MP : 6-mercaptopurine; UC: ulcerative colitis

S1015

Adverse Events and Compliance Among Inflammatory Bowel Disease Patients Treated With Home versus Office-Based Biologic Infusions

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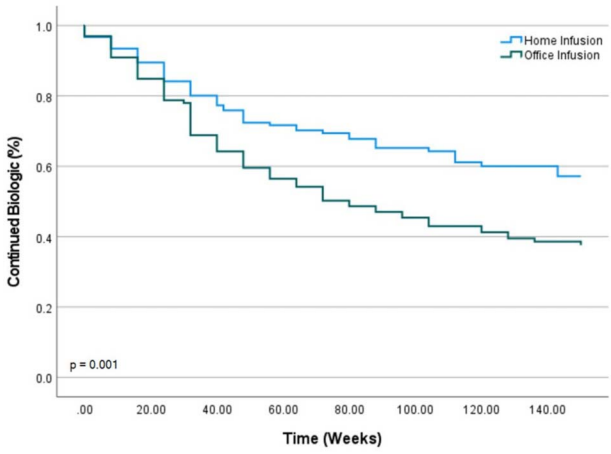
Introduction: Home infusion of infliximab (IFX) and vedolizumab (VDZ) for inflammatory bowel disease (IBD) has recently expanded owing to insurance company requirements and patient (pt) preference for convenience. These biologics are associated with a number of adverse events (AEs). Previous data suggest increased rates of AEs and reduced efficacy of biologics when given at home rather than in a medical office. We sought to assess the rates of AEs, biologic discontinuation, and adherence to follow-up in IBD pts receiving home versus office-based infusions.

Methods: This was a single center retrospective cohort study of adult pts with IBD receiving IFX or VDZ either at home or an office-based infusion center. AEs were defined as immediate (< 24 hour) and delayed (day 1-7) transfusion reaction, steroid initiation, drug discontinuation, or IBD-related emergency room visits, admission, and surgery. Patients were followed for a maximum duration of 150 weeks. Adherence to follow-up was determined by biannual clinic visits and labwork. Chi squared and Fisher's exact tests were used, where appropriate, to determine statistical significance. Kaplan-Meier plot created using SPSS software.

Results: 287 pts (46.0% female, mean age 40.8 years, 61.3% CD, 38.7% UC) were included. The majority were non-Hispanic white with an elevated BMI. The office-based infusion group had more former smokers (35.9% vs 19.0%, p< 0.05), longer disease duration (11.2 vs 8.1 years, p< 0.05), and greater disease severity (Harvey-Bradshaw Index (HBI) 4.9 vs 3.8, p< 0.05) compared to the home infusion group (Table). AEs were higher among office-based infusions (80 vs 56, p< 0.05) driven by delayed transfusion reactions (4 vs 0, p < 0.05), surgery (6 vs 0, p < 0.05), and medication discontinuation (44 vs 35, p < 0.05) (Figure). Pts receiving home infusions were less likely to follow-up in clinic (53.2% vs 71.4%, p< 0.05) and obtain routine labwork (37.9% vs 58.1%, p< 0.05).

Conclusion: Among IBD pts on IFX or VDZ therapy, office-based infusions were associated with higher rates of AEs especially delayed transfusion reactions, need for surgery, and medication discontinuation. Treatment bias may exist towards starting more stable patients on home infusion given the less severe disease that we observed in that group. Adherence to clinic followup and routine labwork was much lower with home infusion. Home biologic infusion appears to be a viable treatment option for IBD if adequate adherence to followup care is maintained.



[1015] **Figure 1.** Adverse event free survival among those on home and office based infusion of biologics for inflammatory bowel disease.

Table 1. Demographics, disease characteristics, adverse events, and compliance among inflammatory bowel disease patients receiving biologic infusion at home or at the office

	Home Infusion	Office Infusion	
	n = 154	n = 133	
Age	37.3 (12.2)	45.0 (16.4)	p < 0.05
Female	81 (52.6%)	52 (39.1%)	p < 0.05
Race			
Non-Hispanic White	131 (85.1%)	102 (77.3%)	
Black	12 (7.8%)	21 (15.9%)	

Table 1. (*continued*)

		Home Infusion	Office Infusion	
	Asian	6 (3.9%)	5 (3.8%)	
	Hispanic	4 (2.6%)	2 (1.5%)	
	Other	1 (0.6%)	2 (1.5%)	
BMI		27.7 (6.5)	27.0 (6.5)	
Current Smoker		10 (6.5%)	10 (7.6%)	
Former Smoker		29 (19.0%)	47 (35.9%)	$p < 0.05$
Disease Duration (Years)		8.1 (8.1)	11.2 (12.6)	$P < 0.05$
Previous IBD Surgery Harvey Bradshaw Index		39 (26.2%) 3.9 (2.9)	37 (28.9%) 4.8 (3.8)	$p < 0.05$
Ulcerative Colitis		61	50	
	Proctitis	12 (19.7%)	13 (26%)	
	Left-Sided	16 (26.2%)	13 (26%)	
	Pancolitis	33 (54.1%)	24 (48%)	
Crohn's Disease		93	83	
	Ileal	25 (26.9%)	24 (28.9%)	
	Colonic	22 (23.7%)	19 (22.9%)	
	Ileocolonic	42 (45.2%)	40 (48.2%)	
	Upper GI	4 (4.3%)	1 (1.2%)	
	Inflammatory	52 (55.9%)	42 (50.1%)	
	Stricturing	18 (19.4%)	26 (31.3%)	
	Fistulizing	23 (24.7%)	15 (18.1%)	
	Perianal	26 (27.1%)	21 (22.8%)	
Concurrent Medication				
	Mesalamine	30 (19.6%)	44 (33.3%)	$P < 0.05$
	Thiopurines	14 (9.2%)	15 (11.4%)	
	Methotrexate	3 (2.0%)	9 (6.8%)	
Biologic Use				
	Naive	86 (56.2%)	74 (55.6%)	
	Previous Use	67 (43.8%)	59 (44.4%)	
	# Previous Biologics	1.4 (0.7)	1.5 (0.7)	
Major Adverse Event		56	80	$p < 0.05$
	Transfusion Reaction, Immediate	8	9	
	Transfusion Reaction, Delayed	0	4	$p < 0.05$
	ED Visit	0	1	
	Admission	7	6	
	Surgery	0	6	$p < 0.05$
	Steroid Initiation	6	10	
	Discontinuation	35	44	$p < 0.05$
Office Visit Every 6 Months		53.2%	71.4%	$p < 0.05$
Labs Obtained Every 6 Months		37.9%	58.1%	$p < 0.05$

S1016

Inflammatory Bowel Disease Superimposed on HIV Infection: A Mirror Image of the Remission Hypothesis?

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Introduction: The intestinal epithelium is the interface between a sterile internal environment and a contaminated external environment. The conflicting needs for intimate contact to facilitate solute and water absorption while protecting against microbial invasion requires a complex defense to distinguish pathogen from non-pathogen and limit the scope and intensity of the inflammatory response. Untreated HIV infection and IBD exist at opposite ends of a spectrum, immune deficiency vs immune hyperactivity, but may coexist. In the past, IBD typically preceded HIV infection and immune depletion often was accompanied by remission of the GI disease, which led to the "Remission hypothesis". In the current era, HIV infection often precedes the development of IBD. It is unclear if the sequence in which the two diseases develop affects their clinical course.
Methods: Chart review of patients with coexisting HIV infection and IBD was performed; clinical and laboratory findings of 7 patients with IBD superimposed on HIV infection were reviewed.
Results: Five patients were African American, one was Caucasian, and one was of mixed race; five were men and two were women. All patients had colonic involvement and one also had small intestinal disease. Endoscopic and histologic features were more typical of Crohn's disease than of ulcerative colitis. Five patients presented with severe, complex perianal fistulous disease. One patient had a history of hidradenitis suppurativa and three had aseptic necrosis of the femoral heads on or prior to presentation. All seven subjects had stable HIV infection, with undetectable plasma HIV RNA and CD4 counts great than 400 cells/mm^3 at diagnosis. No one had ever had a serious opportunistic infection. Four patients responded well to biologic agents, one responded to corticosteroids, and two have recently been initiated on therapy.

Conclusion: These data suggest that the sequence of developing HIV infection and IBD may influence the clinical course. While progressive immune depletion in HIV infection may diminish the clinical severity of established IBD, its *de novo* development in an HIV-infected patient may lead to serious disease with significant disease-related morbidity. We hypothesize that the development of IBD in an HIV-infected patient may be a mirror image of the remission hypothesis; prospective studies are needed for confirmation.

S1017

Outcomes of Patients Hospitalized for Inflammatory Bowel Disease With Comorbid Generalized Anxiety Disorder

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Introduction: The development of inflammatory bowel disease (IBD) is multifactorial. A risk factor for IBD is stress from anxiety. Generalized anxiety disorder (GAD), a prevalent form of anxiety, is twice as common in IBD patients. This study explores the outcomes of adults hospitalized for IBD with comorbid GAD.
Methods: Adults hospitalized for IBD were selected from the 2014 National Inpatient Sample database. ICD-9 codes were used to select diagnoses. Demographic data and outcomes of IBD were compared between a subgroup with GAD and a subgroup without GAD. The outcomes of interest were hypotension/shock, sepsis, acute hepatic failure, acute respiratory failure, acute renal failure (AKI), myocardial infarction (MI), acute deep vein thrombosis (DVT), ileus, inpatient mortality, colectomy, intestinal abscess, obstruction, and perforation. Chi-squared tests and independent t-tests were used to compare proportions and means respectively. A multivariate logistic regression analysis was used to establish if GAD is an independent predictor for the outcomes, after adjusting for age, sex, race, and Charlson Comorbidity Index (CCI).
Results: Among 24,773 IBD patients, 3,400 also had GAD. Patients with comorbid GAD were more likely to be younger (54.8 vs. 55.9 years old, $p< 0.001$), to be female (68.6% vs. 46.3%, $p< 0.001$), to be white (86.1% vs. 76.7%, $p< 0.001$), to have a lower hospitalization cost ($56,313 vs. $68,784, $p< 0.001$) and a lower CCI (2.45 vs. 2.65, $p< 0.001$). There was no significant difference in length of stay (6.6 vs. 6.8 days, $p=0.264$). After adjusting for age, sex, race, and CCI, GAD was found to be a risk factor for sepsis (adjusted odds ratio (aOR) 1.33, 95% confidence interval (CI) 1.17-1.50, $p< 0.001$), acute hepatic failure (aOR 1.80, 95% CI 1.18-2.73, $p=0.006$), acute respiratory failure (aOR 1.24, 95% CI 1.04-1.49, $p=0.018$), inpatient mortality (aOR 1.87, 95% CI 1.50-2.31, $p< 0.001$), intestinal abscess (aOR 2.35, 95% CI 1.20-4.61, $p=0.013$) and perforation (aOR 1.44, 95% CI 1.06-1.95, $p=0.019$). The aORs were not statistically significant for hypotension/shock ($p=0.306$), AKI ($p=0.083$), MI ($p=0.278$), DVT ($p=0.972$), ileus ($p=0.613$), colectomy ($p=0.760$), and obstruction ($p=0.129$). (Table)
Conclusion: In IBD patients, GAD is a risk factor for sepsis, acute hepatic failure, acute respiratory failure, intestinal abscess, perforation, and inpatient mortality. The worse outcomes may be attribuTable to the microbiome disruption as well as poor medication compliance associated with GAD.

Table 1. **Title: Multivariate logistic regression analysis of clinical outcomes among inflammatory bowel disease patients**

Outcomes	Adjusted odds ratio*	95% confidence interval	p-value
Acute deep vein thrombosis	0.99	0.73-1.35	0.972
Acute hepatic failure	1.80	1.18-2.73	0.006
Acute renal fail	1.11	0.99-1.24	0.083
Acute respiratory failure	1.24	1.04-1.49	0.018
Colectomy	1.06	0.69-1.63	0.760
Hypotension/shock	0.94	0.84-1.06	0.306
Ileus	1.05	0.88-1.24	0.613
Inpatient mortality	1.87	1.50-2.31	< 0.001
Intestinal abscess	2.35	1.20-4.61	0.013
Intestinal obstruction	1.20	0.95-1.53	0.129
Intestinal perforation	1.44	1.06-1.95	0.019
Myocardial infarction	1.18	0.87-1.62	0.278
Sepsis	1.33	1.17-1.50	< 0.001

Footnote: *Adjusted for age, sex, race, and Charlson comorbidity index

S1018

Prior Authorization of Inflammatory Bowel Disease Prescriptions: A Single System Review of Current Practices and Adverse Events Associated With Delays

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Introduction: Since the introduction of the prior authorization (PA) process by health insurances and pharmacy benefit managers (PBM) for a growing number of medications, it has become increasingly challenging for healthcare providers (HCPs) to ensure their patients receive appropriate treatment in a timely manner. Insurers and PBMs justify PA out of concern for unregulated prescription of medications that can have dangerous side effects, interact with other medications, abuse potential, or the availability of less expensive alternatives. HCPs often sacrifice time and resources appealing denials or redesigning management plans. More concerning is potential harm to the patient related to delays in care. While prior studies have looked at subjective HCP viewpoints on PA in Inflammatory Bowel Disease (IBD), there is limited literature in quantification of delays and direct adverse outcomes. This study aims to evaluate practices in PA, potential delays, and adverse effects related to delays in approval for specialty therapy for IBD.
Methods: A retrospective review was performed at a single tertiary academic medical center for adult patients with IBD prescribed new IBD medication(s) requiring PA. Data collected from each medical record included time from prescription to PA approval. Negative outcomes were assessed including hospital admission, steroid bridge to the new prescription, or surgery.
Results: Of 485 PAs submitted, a review was performed on 42 randomly selected IBD patients with IBD prescription requiring a PA between 9/2021- 3/2022. Mean length of time from prescription to PA approval was 5.8 days (Range: 1-34 days). Of 42 patients, 11 (26%) patients waited longer than 2 business weeks for PA approval, 1 patient (3%) required hospitalization and 3 (7%) patients required steroids during windows of delay. Average time to PA approval for non-commercial vs commercial insurers was 22 vs 6 days. All PAs were ultimately approved.
Conclusion: In this descriptive study, the average length of PA approval for a new IBD prescription was 5.8 days, with over 25% with greater than 2 business weeks for PA approval. These results show that the PA process for patients with IBD can benefit from closer, data driven investigation. Further analysis is planned for continuation and dosage changes in therapy requiring PA with the goal of identifying the best practices that can be widely adopted to minimize delays and improve patient care.

S1019

Long-Term Outcomes of Treatment With and De-Escalation From a Combination of Vedolizumab and Another Biologic or Tofacitinib for Inflammatory Bowel Disease

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Introduction: There are scant data on long-term outcomes of treatment of inflammatory bowel disease (IBD) with a combination of advanced therapies, including after de-escalation.
Methods: We identified patients with IBD at a tertiary center who began therapy with vedolizumab (VDZ) in combination with another advanced therapy (biologic or JAK inhibitor) between 2016 and 2020 and examined their outcomes through 6/1/22. We defined biochemical remission as CRP< 5 mg/L and calprotectin < 150 mcg/g, and endoscopic remission as Mayo endoscopic subscore 0 or simple endoscopic score for Crohn's disease (CD) 0. Short-term outcomes of this cohort were previously reported.

Results: Fourteen patients with a median of 322 (IQR 251-322) weeks of follow up were identified. 10 had ulcerative colitis, 3 CD, and 1 indeterminate colitis. VDZ was combined with tofacitinib in 9 patients, ustekinumab in 3 and adalimumab in 2. Median time on combination therapy was 94 weeks (IQR 17-133). Eight patients achieved objective remission (3 biochemical, 5 endoscopic), 1 changed combination with subsequent endoscopic remission, 2 had primary non-response, 1 had secondary non-response, 1 stopped within 1 month due to reported adverse effect (paresthesia), and 1 lacked follow-up data. Eight patients de-escalated to a single agent, 4 at physician direction and 4 due to insurance denial. Before de-escalation, 6 had objective remission (2 biochemical, 4 endoscopic). After de-escalation, 3 patients maintained objective remission (2 biochemical, 1 endoscopic), 3 had disease flare, of which 1 required colectomy, and 2 lacked data. All 3 patients with disease flare had de-escalated following an insurance denial. Two patients remained on combination therapy through follow up: 1 has endoscopic remission after changing one drug of their combination and 1 has ongoing moderate endoscopic disease despite combination therapy. There were 2 infections requiring hospitalization (rotavirus, C. difficile), and 8 non-serious infections (5 mild SARS-COV-2, 1 peristomal cellulitis, 1 pneumonia, 1 sinus) while on combination therapy.
Conclusion: In long-term follow up of this small cohort, there were no new signals on effectiveness or safety of combining advanced agents. De-escalation to a single agent was tolerated in half of patients with follow-up data; all patients who flared following de-escalation had adjusted therapy due to insurance denial. More data is needed to inform de-escalation decisions.

S1020

The Prevalence of Asthma Are Increased in Inflammatory Bowel Disease, but Decreased After Biologics Treatment: A Population-Based Study

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Introduction: Inflammatory bowel disease (IBD) patients exhibit higher association with asthma. IBD and asthma are both immune-mediated disorders. Also, they share genetic and environmental factors. Previous studies suggested that initiation of biologics could achieve remission of asthma. However, data is limited in IBD. We sought to investigate the prevalence of asthma in IBD patients with and without biologics.
Methods: We used a commercial database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on Systematized Nomenclature Of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) who were diagnosed with either CD or UC between 1999 and 2022 who were treated with any type of biologics. We investigated the prevalence of asthma in IBD patients compared to patients with no IBD. Also, we compared the prevalence between IBD patients with and without biologics therapy.
Results: Of the 70,040,480 individuals in the database, we identified 249,480 (0.4%) patients with CD and 209,020 (0.3%) patients with UC, of whom 44,930 (18%) and 23,040 (11%) patients received biologics therapy, respectively. The prevalence of asthma was 21% for each CD and UC, compared to 7% in individuals without IBD, $p< 0.0001$ to all. The prevalence of asthma was significantly lower in biologics treated CD patients (16%) compared to those who did not receive biologics (22%) (Figure). Similarly, biologics treated UC patients were significantly less likely to have asthma (16%) compared to UC patients who did not receive biologics therapy (21%), $p< 0.0001$to all (Figure).
Conclusion: This is the largest individual study investigating prevalence of asthma in patients with IBD with and without biologics therapy. We found that IBD patients who were treated with biologics were significantly less likely to have asthma when compared to IBD individuals who were never treated with biologics.

Figure 1: Crohn's disease.

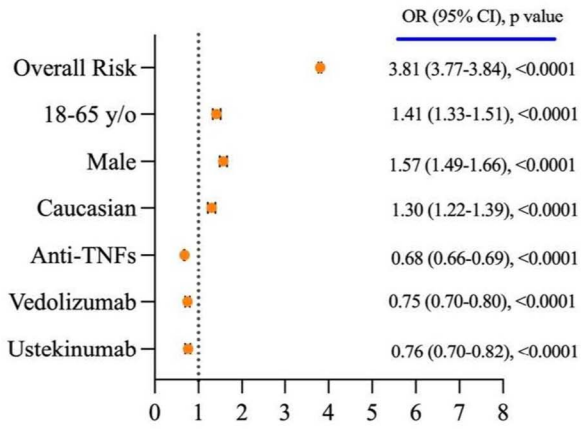
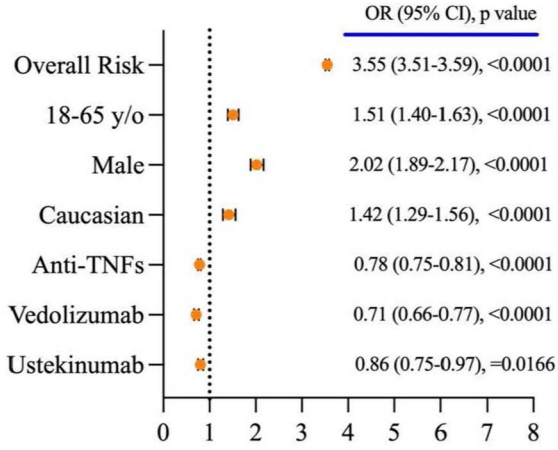


Figure 1: Ulcerative colitis.



[1020] **Figure 1.** The Effect of Biologics in Patients with Asthma and Inflammatory Bowel Disease.

S1021

Inflammatory Bowel Disease, Subclinical Atherosclerosis, and Cardiovascular Disease: A Case-Control Analysis

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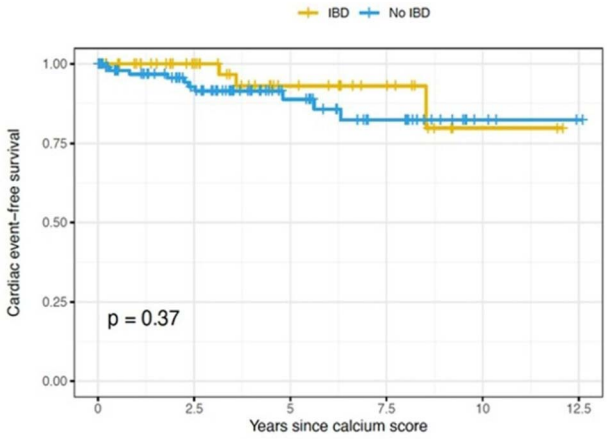
Introduction: Inflammatory Bowel Disease (IBD) is classified with other immune-mediated inflammatory diseases (IMID). Many IMID such as rheumatoid arthritis and systemic lupus erythematosus have been shown to predispose patients to atherosclerotic cardiovascular disease (ASCVD) even without traditional cardiovascular risk factors. An association between IBD and ASCVD has been reported, but is less well-defined. In addition, there is lacking data on risk of subclinical atherosclerosis in patients with IBD.
Methods: We performed a case-control analysis of patients seen at a tertiary medical center who underwent coronary calcium scoring (CCS) as part of routine clinical care. Patients IBD were compared to patients without IBD for differences in CCS and development of cardiac events and/or death. Controls were randomly selected from age and sex matched lists of CCS and excluded if they had a prior history of ASCVD. The association of IBD status with time to cardiac events or death was compared using log rank tests, and Cox regression was used to estimate hazard ratios. Subjects were considered at risk from the time of CCS until they had the event of interest or were censored at last contact.
Results: A total of 53 IBD case subjects [28 Crohn's disease (CD); 24 Ulcerative Colitis (UC)] and 106 controls without IBD were included. There were no significant differences between the two groups regarding BMI, race, smoking status, statin use, diabetes, or aspirin use. The was no significant difference in CCS between the two groups (1.1 vs. 0, p = 0.59). Within the IBD population, there was no difference in the CCS between CD and UC (0 for CD and 7.5 for UC; p = 0.48). There was no significant difference in development of cardiac events or death between IBD cases and non-IBD controls (p = 0.37) during follow up. The hazard ratio for a doubling of the CCS and development of cardiac events or death was significant (HR 1.27, 95% CI 1.09-1.49; p = 0.003); however, IBD status was not found to be significant (HR 1.95, 95% CI 0.53-7.12, p =0.3). (Figure)
Conclusion: IBD status does not appear to be associated with increased risk of subclinical atherosclerosis as measured by CCS. Elevation in the CCS is associated with risk of cardiac events and death; however, IBD status does not appear to be associated with risk of cardiac events and death. Larger studies are needed to further define the relationship between IBD, subclinical atherosclerosis, and ASCVD. (Table)



[1021] **Figure 1.** Cardiac event-free Survival in IBD cases vs. non-IBD Controls

Table 1. Demographics by IBD case/control status

	IBD n=53	Non-IBD n=106	P-value
Age	55	56	0.97
Female	18 (34%)	34 (32%)	0.81
BMI	28	27	0.99
Race: Caucasian	53 (100%	100 (94%)	0.21
Smoker	14 (26%)	28 (26%)	1
Statin use	22 (42%)	57 (46%)	0.57
Diabetes	5 (9%)	10 (9%)	1
Aspirin Use	9 (17%)	26 (25%)	0.28

S1022

Treatment Preferences in Crohn's Disease Perianal Fistula: Patient Perspectives

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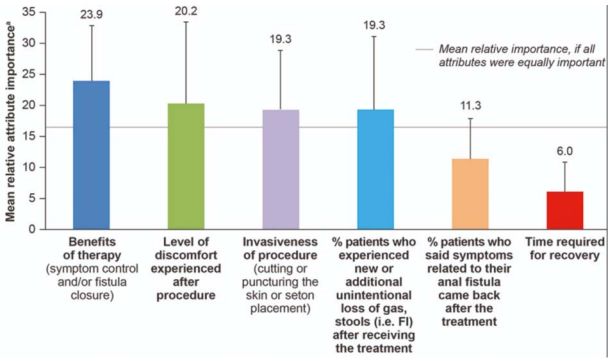
Introduction: Crohn's perianal fistulas (CPFs) are a common complication of Crohn's disease, and patients with CPF have a high treatment burden that can negatively affect their quality of life (QoL). This study aimed to assess patient satisfaction with current CPF treatments and preferences for future CPF treatment attributes.
Methods: A US observational study was conducted among patients aged ≥21 and ≤89 years with self-reported physician-diagnosed CPF (±CPF-related surgery). Using a web-enabled questionnaire, patient satisfaction with CPF treatments and treatment attribute importance over the past 12 months were rated using a 1–9 scale (1=not at all satisfied, 9=extremely satisfied). A discrete choice experiment (DCE) evaluated patient preferences for future CPF treatment attributes. Data were analyzed using descriptive statistics and hierarchical Bayesian modeling for DCE.
Results: In total, 100 patients were recruited, with a mean (standard deviation [SD]) age of 40.0 [12.2] years. Mean number of unique CPFs was 2.7 [2.4], mean disease duration since diagnosis was 9.1 [9.9] years and 53% reported having complex fistula. For those who had CPF-related surgery and/or seton placement, treatment satisfaction was highest for fistulectomy/fistulotomy and ligation of the intersphincteric fistula tract and lowest for fibrin glue, short- and long-term setons (Table). Biologics were used by 90% of patients, infliximab having the highest overall satisfaction (6.6 [2.5]). Patient attitudes toward current CPF treatments identified a need for new treatment options (7.1 [1.8]). For all patients, improvement in QoL (60%) and avoidance of future surgery (50%) were the most important treatment goals. A lower risk of symptom recurrence (8.2 [1.1]), quick improvement in QoL (8.1 [1.1]), reduction in fistula/no large abscess (8.0 [1.4]) and better symptom control (8.0 [1.3]) were the most important current treatment attributes. The DCE identified symptom control/fistula closure, then post-operative discomfort as the most important attributes for therapies (Figure). Patients considered low fecal incontinence important and preferred procedures with minimal cutting/puncturing and those where treatments were injected into the anal area.
Conclusion: Improvements in patient CPF treatment satisfaction and new treatments are required. Clinical development of CPF treatments should consider patient-centric attributes for clinical trial endpoints and when assessing treatment effectiveness.



[1022] **Figure 1.** Mean relative attribute importance of future CPF treatments. a = Numbers above columns represent mean relative attribute importance. Mean relative attribute importance is a measure of how important an attribute is when selecting a procedure for CPF, in the context of all attributes tested in the DCE design. It is presented as a normalized score summing to 100 across all

attributes tested. A higher value for an attribute indicates higher importance when selecting a procedure for CPF, and a lower value indicates lower importance. CPF, Crohn's perianal fistula; DCE, discrete choice experiment; FI, fecal incontinence.

Table 1. Satisfaction with CPF-related procedures/surgeries and medication

	All CPF N = 100
Satisfaction with CPF-related procedures/surgeries (mean [SD])[a]	
Fistulectomy/fistulotomy[b]	7.6 (1.8)
Ligation of the intersphincteric fistula tract (LIFT)[b]	7.6 (1.5)
Endorectal/anal advancement flap[b]	7.2 (2.3)
Anal fistula plug[b]	7.0 (1.4)
Long-term seton placement[c]	6.5 (2.1)
Short-term seton placement[c]	6.3 (2.3)
Fibrin glue[b]	6.2 (1.9)
Satisfaction with medications (mean [SD])[a,b,c]	
Remicade (infliximab)	6.6 (2.5)
Stelara (ustekinumab)	6.5 (2.6)
Prednisolone or methylprednisolone	6.3 (2.3)
Imuran (azathioprine)	5.9 (2.8)
Humira (adalimumab)	5.8 (2.7)
Rheumatrex, Trexall (methotrexate)	5.4 (2.7)
Entocort EC (budesonide)	5.4 (2.6)
Flagyl (metronidazole)	5.3 (2.6)
Cipro (ciprofloxacin)	5.2 (2.4)
Purinethol (mercaptopurine)	4.9 (2.6)
Asacol, Delzicol, Pentasa, Lialda, Apriso (mesalamine)	4.8 (2.9)
Azulfidine (sulfasalazine)	4.7 (2.6)

a = Satisfaction scores were assessed using a 1–9 scale (1 = not at all satisfied, 9 = extremely satisfied). b = Patients with CPF who have undergone surgery. c = Patients with CPF who have and have not undergone surgery. CPF, Crohn's perianal fistulas; LIFT, ligation of the intersphincteric fistula tract; SD, standard deviation.

S1023

Assessment of Health-Related Quality of Life and Patient-Reported Outcomes With Tofacitinib Treatment Stratified by Age in Patients From the OCTAVE Ulcerative Colitis Clinical Program

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Introduction: Tofacitinib is an oral small molecule JAK inhibitor for the treatment of UC. Consistent with previous studies in patients (pts) with inflammatory bowel disease (IBD) and the general population, analyses from the tofacitinib OCTAVE UC clinical program demonstrated that older age was associated with poorer health outcomes in pts with UC.[1] To further understand the relationship between age and risk/benefit of tofacitinib, this post hoc analysis assessed HRQoL and pt-reported outcomes (PROs) stratified by age among pts enrolled in the tofacitinib OCTAVE UC clinical program.
Methods: Data up to Week (W)8 of the Phase (P)3 induction studies (OCTAVE Induction 1&2 [NCT01465763; NCT01458951]), W52 of the P3 maintenance study (OCTAVE Sustain [NCT01458574]), and Month 48 of the open-label, long term extension (OLE) study (OCTAVE Open [NCT01470612]) were analyzed. Proportions of pts with an IBD Questionnaire (IBDQ) total score ≥ 170 (i.e., IBDQ remission; cut-off generally corresponds to clinical remission), and mean changes from induction study baseline in the Mayo stool frequency subscore (SFS) and rectal bleeding subscore (RBS), stratified by age, were evaluated.
Results: The age distribution of pts who enrolled in the OCTAVE UC clinical program was generally similar across the studies and treatment groups.[1] In OCTAVE Induction 1&2 and OCTAVE Sustain, proportions of pts who received tofacitinib treatment and who had an IBDQ total score ≥ 170 were generally higher than those who received placebo (PBO), regardless of age (Figure a–b). In OCTAVE Open, proportions of pts treated with tofacitinib 5 mg BID and with an IBDQ total score ≥ 170 were generally similar among the age groups (Figure c). A trend toward better HRQoL with older age was observed in the tofacitinib 10 mg BID group (Figure d). In OCTAVE Induction 1&2, pts who received tofacitinib 10 mg BID had a greater change from baseline in SFS and RBS compared with PBO, regardless of age. In OCTAVE Sustain and OCTAVE Open, there was no consistent trend for change from baseline in SFS among age and treatment groups, and similar changes from baseline in RBS were observed across age groups among tofacitinib-treated pts (Table).
Conclusion: Tofacitinib demonstrated consistent efficacy for achieving IBDQ remission and was associated with improvements in PROs across all age groups. This analysis was limited by the small number of pts in each age group.

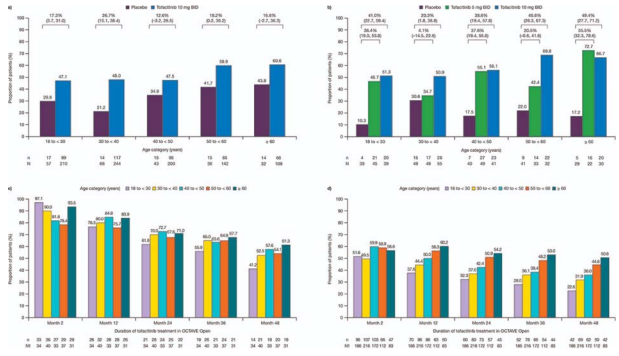
Table 1. Change from induction study baseline in Mayo stool frequency and rectal bleeding subscores among patients in the OCTAVE UC clinical program, stratified by age (full analysis set, observed)

		OCTAVE Induction 1&2[a]			OCTAVE Sustain[b]		OCTAVE Open[c]	
		Placebo (N=234)	Tofacitinib 10 mg BID (N=905)	Placebo (N=198)	Tofacitinib 5 mg BID (N=198)	Tofacitinib 10 mg BID (N=197)	Tofacitinib 5 mg BID (N=175)	Tofacitinib 10 mg BID (N=769)
Change from baseline in Mayo stool frequency subscore, mean (SD)								
Age category (years)	18 to < 30	–0.5 (0.8)	–0.9 (1.1)	–2.2 (1.0)	–1.8 (1.0)	–2.2 (0.7)	–2.0 (1.0)	–1.9 (1.0)
	30 to < 40	–0.5 (0.8)	–1.0 (1.0)	–1.4 (1.2)	–1.4 (1.0)	–1.6 (0.8)	–1.9 (1.2)	–2.2 (0.9)
	40 to < 50	–0.7 (0.9)	–1.1 (1.1)	–1.6 (0.7)	–1.7 (0.9)	–1.6 (1.0)	–1.9 (0.9)	–2.4 (0.6)
	50 to < 60	–0.6 (1.0)	–1.3 (1.0)	–1.8 (0.9)	–1.9 (1.0)	–1.9 (0.7)	–2.0 (1.2)	–2.0 (0.8)
	≥ 60	–0.6 (0.8)	–1.1 (1.0)	–0.7 (1.1)	–2.1 (1.0)	–1.5 (1.0)	–1.8 (0.8)	–2.3 (0.7)

Table 1. (*continued*)

		OCTAVE Induction 1&2[a]			OCTAVE Sustain[b]		OCTAVE Open[c]	
		Placebo (N=234)	Tofacitinib 10 mg BID (N=905)	Placebo (N=198)	Tofacitinib 5 mg BID (N=198)	Tofacitinib 10 mg BID (N=197)	Tofacitinib 5 mg BID (N=175)	Tofacitinib 10 mg BID (N=769)
Change from baseline in Mayo rectal bleeding subscore, mean (SD)								
Age category (years)	18 to < 30	–0.8 (0.8)	–1.0 (0.9)	–1.7 (0.5)	–1.5 (0.8)	–1.7 (0.6)	–1.6 (0.5)	–1.6 (0.7)
	30 to < 40	–0.6 (0.8)	–1.1 (0.9)	–1.4 (0.7)	–1.3 (0.7)	–1.5 (0.7)	–1.5 (0.9)	–1.7 (0.7)
	40 to < 50	–0.7 (0.8)	–1.1 (0.9)	–1.6 (0.9)	–1.4 (0.8)	–1.5 (0.7)	–1.6 (0.7)	–1.7 (0.6)
	50 to < 60	–0.7 (0.8)	–1.2 (0.8)	–1.4 (0.5)	–1.6 (0.6)	–1.5 (0.5)	–1.6 (0.6)	–1.5 (0.6)
	≥ 60	–0.8 (1.0)	–1.2 (0.8)	–0.7 (1.1)	–1.6 (0.6)	–1.4 (0.7)	–1.6 (0.6)	–1.6 (0.5)

[a]Data are taken from Week 8 of OCTAVE Induction 1&2
[b]Data are taken from Week 52 of OCTAVE Sustain
[c]Data are taken from Month 48 of OCTAVE Open
BID, twice daily; N, number of patients; OLE, open-label, long-term extension; SD, standard deviation; UC, ulcerative colitis



[1023] **Figure 1.** Proportions of patients with an Inflammatory Bowel Disease Questionnaire total score ≥ 170 among patients at a) Week 8 of OCTAVE Induction 1&2[a] and b) Week 52 of OCTAVE Sustain[a] and in the c) tofacitinib 5 mg BID[b] and d) tofacitinib 10 mg BID[b] groups in OCTAVE Open, stratified by age. Values above brackets show the treatment difference from placebo (95% CI) [a] Non-responder imputation for missing data [b] Non-responder imputation for missing data at all visits but last observation carried forward for visits after a patient advanced to next study BID, twice daily; CI, confidence interval; IBDQ, Inflammatory Bowel Disease Questionnaire; n, number of patients with the specified response within the given category; N, number of patients in the analysis set; N1; number of patients who, based on their enrollment dates and last non-missing IBDQ total score, could have reached the specified timepoint by the end of the study; OLE, open-label, long-term extension

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S1024

Dermatologic Manifestations in Patients With Inflammatory Bowel Disease

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Introduction: There are several extraintestinal manifestations of inflammatory bowel disease (IBD) including cutaneous. Furthermore, new biologics have been also associated with cutaneous side effects. However, the prevalence of extraintestinal manifestations in patients with IBD and those who receive anti-tumor necrosis factors (anti-TNFs) have not been extensively studied. Using a large database, we sought to describe the rates of selected cutaneous manifestations of IBD as long as adverse effects of anti-TNFs.
Methods: We queried a multi-institutional database (Explorys Inc, Cleveland, OH, USA), an aggregate of electronic health record data from 26 US healthcare systems was surveyed. A cohort of patients with a Systematized Nomenclature of Medicine-Clinical Terms of inflammatory bowel disease between 2017-2021 was identified. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS version 25, IBM Corp). For all analyses, a 2-sided P value of < 0.05 was considered statistically significant.
Results: Of the 34,277,840 individuals in the database, 142,890 (0.42%) and 165,960 (0.48%) had a diagnosis of ulcerative colitis (UC) and Crohn's disease (CD) respectively. Baseline characteristics of patients with IBD and control group are shown in Table 1. Compared to the non-IBD group, patients with a history of IBD had a higher rates of multiple skin conditions including erythema nodosum, pyoderma gangrenosum, sweet syndrome, psoriasis, lichen planus, alopecia, eczema, vitiligo, bullous disease, and skin cancers. Among IBD patients, those who are on anti-TNFs and immunomodulator (IM) had higher rates of herpes/zoster and candida infections, lichen planus, alopecia, eczema and melanoma and non-melanoma skin cancers compared to anti-TNFs alone (Table 3).
Conclusion: In this large database, we found a higher risk association between IBD and multiple skin conditions including skin cancers. Interesting, IBD patients treated with anti-TNFs had double rates of melanoma and non-melanoma skin cancers. Further epidemiological studies are required to validate these findings and increase attention to adequately screening for skin cancers and dermatology referral while taking care of IBD.

Table 1: Baseline characteristics of patients with IBD and control group

		Ulcerative colitis N = 142890	Crohn's disease N = 165960	Non-IBD N = 34004490
Age	>65	50,480 (35.3)	46,170 (27.8)	7,938,130 (23.3)
	18-65	91,210 (63.8)	116,960 (70.5)	20,040,730 (58.9)
Sex	Male	56,620 (39.6)	64,530 (38.9)	15,076,750 (44.3)
Race	Caucasian	108,870 (76.2)	122,950 (74.1)	17,622,730 (51.8)
	Arican-American	10,280 (7.2)	14,050 (8.5)	3,616,750 (10.6)
	Asian	1,820 (1.3)	1,870 (1.1)	511,840 (1.5)
Meds	IM	13,940 (9.8)	22,100 (13.3)	40,110 (0.1)
	Anti-TNFs	16,300 (11.4)	31,010 (18.7)	92,800 (0.3)
	Ustekinumab	1,540 (1.1)	4,240 (2.6)	7,930 (0.02)
	Vedolizumab	4,710 (3.3)	5,810 (3.5)	
	Tofacitinib	460 (0.3)		10,600 (0.03)

Table 2: Cutaneous manifestations of IBD and side effects of anti-TNFs

Skin condition	UC	CD	Non-IBD
Erythema nodosum	0.427%	0.609%	0.035%
Pyoderma gangrenosum	0.476%	0.542%	0.012%
Sweet syndrome	0.042%	0.042%	0.003%
Polyarteritis nodosa	0.056%	0.054%	0.011%
Epidermolysis bullosa	0.003%	0.012%	0.003%
Psoriasis	2.932%	3.278%	0.934%
Guttate psoriasis	0.049%	0.066%	0.017%
Psoriasis vulgaris	0.434%	0.440%	0.145%
Pustular psoriasis	0.070%	0.108%	0.021%
Lichen planus	0.364%	0.277%	0.109%
Alopecia	3.079%	2.766%	1.143%
Eczematous dermatitis	14.641%	13.702%	7.297%
Vitiligo	0.329%	0.259%	0.117%
aphthous ulcers of the mouth	1.092%	1.223%	0.343%
Actinic keratosis	6.369%	5.061%	2.253%
Squamous cell carcinoma of skin	1.610%	1.416%	0.512%
Basal cell carcinoma of skin	2.799%	2.308%	0.996%
Malignant melanoma	1.267%	1.048%	0.425%
Cutaneous side effects among IBD patients on anti-TNFs			
Skin condition	**UC**	**CD**	**Non-IBD**
Herpes-zoster	5.95%	5.42%	1.50%
Cutaneous candidiasis	3.37%	2.87%	0.88%
Cutaneous vasculitis	0.25%	0.19%	0.02%
Lichen planus	0.37%	0.32%	0.11%
Alopecia	4.17%	3.64%	1.14%
Eczematous dermatitis	20.86%	18.93%	7.30%
Actinic keratosis	5.28%	4.58%	2.25%
Squamous cell carcinoma of skin	1.29%	1.35%	0.51%
Basal cell carcinoma of skin	2.52%	2.16%	1.00%
Malignant melanoma	1.23%	0.90%	0.42%

[1024] **Figure 1.**

S1025

Prevalence of Osteoporosis Among Patients With Inflammatory Bowel Diseases: A Retrospective Cohort Study

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Introduction: IBD patients are at increased risk for loss of bone mass due to diverse factors such as steroid treatment, chronic inflammation, and malabsorption. Guidelines recommend screening IBD patients with high steroid use, and recurrent or persistently active disease for osteoporosis with a DXA scan. We evaluated the prevalence, and characteristics of osteoporosis in a nationwide cohort of IBD patients.
Methods: This is a retrospective cohort study. We collected data from the Healthcare Cost and Utilization Project (HCUP) Nationwide Readmission Databases (NRD) 2016-2018. Median and IQR were used to describe Continuous variables, and proportions were used with categorical variables. Comparison between groups was performed by Mann Whitney test for continuous variables and the Chi-Square test for Categorical variables.
Results: We analyzed 365,152 index hospital discharges with IBD. Of whom, 15,726 (4.3%) had osteoporosis and 4,375 (1.2%) had Osteopenia. Of those with osteoporosis, 95.1% had osteoporosis without pathological fracture while 4.9% had osteoporosis with a pathological fracture. The majority of IBD patients with osteoporosis were females (80.5%). IBD patients with osteoporosis were older (median age: 71; Interquartile range (IQR): 62-81 vs 55; IQR: 37-69, P < 0.001), more common to have hypertension (40.6% vs. 31.3%, P< 0.001), abnormal weight loss (1.8% vs. 1.7%, P < 0.001), dyslipidemia (39.7% vs. 24%, P < 0.001), vitamin D deficiency (7.1% vs. 2.7%, P < 0.001), hypocalcemia (2.7% vs. 1.8%, P < 0.001), COPD (20.8% vs. 10,8%, P < 0.001), CKD (17.3% vs. 9.7%, P < 0.001), increased median length of stays in days (4; IQR: 2-7 vs. 3; IQR: 2-6, P< 0.001), higher mortality (2.1% vs. 1.5%, P < 0.001), higher median total charges ($37,782; IQR: $20,330 - $70,987 vs. $32,418; IQR: $17,752 - $62,023, P< 0.001) and a higher 30-day all-cause readmission rate (10% vs. 9.2%, P= 0.003) compared to IBD patients without osteoporosis respectively. (Table)
Conclusion: In our nationwide cohort of hospitalized IBD patients, more than four percent had osteoporosis. IBD patients with osteoporosis had a higher prevalence of vitamin D deficiency, hypocalcemia, weight loss, and dyslipidemia. Multiple studies reported inconsistent use of osteoporosis screening and underuse of osteoporosis treatment with calcium, vitamin D, and Bisphosphonates. Using our nationwide cohort, we aim to highlight the significant prevalence of osteoporosis and associated hospitalization outcomes in this patient population.

Table 1. Baseline and clinical characteristics of IBD patients with and without Osteoporosis

		OP absent N= 349,426	OP present N= 15,726	P-value
Median Age (IQR)		**55 (37 - 69)**	**71 (62 - 81)**	**< 0.001**
Sex, %	Male	154,405 (44.2)	3071 (19.5)	< 0.001
	Female	195,021 (55.8)	12,655 (80.5)	
Bed size of the hospital, %	Small	55,476 (15.9)	2,653 (16.9)	< 0.001
	Medium	97,319 (27.9)	4,129 (26.3)	
	Large	196,631 (56.3)	8,944 (56.3)	
CKD, %		33,887 (9.7)	2721 (17.3)	< 0.001
Heart failure, %		30,469 (8.7)	2,285 (14.5)	< 0.001

Table 1. (*continued*)

		OP absent N= 349,426	OP present N= 15,726	P-value
Median Age (IQR)		**55 (37 - 69)**	**71 (62 - 81)**	**< 0.001**
Cirrhosis, %		7,706 (2.2)	443 (2.8)	< 0.001
Hypocalcemia (%)		6,299 (1.8)	430 (2.7)	< 0.001
Iron deficiency anemia		31,725 (9.1)	1,553 (9.9)	0.001
Family history of osetoporosis		106 (0.0003)	44 (0.3)	< 0.001
COPD		37,618 (10.8)	3,276 (20.8)	< 0.001
Hypertension, %		109,218 (31.3)	6,379 (40.6)	< 0.001
Diabetes mellitus, %		60,150 (17.2)	2,771 (17.6)	0.187
Dyslipidemia, %		84,030 (24)	6,244 (39.7)	< 0.001
Vitamin D deficiency		9,535 (2.7)	1,110 (7.1)	< 0.001
Weight disorders	None Weight loss Obesity or overweight	301,574 (86.3) 5,795 (1.7) 42,057 (12)	14,116 (89.8) 278 (1.8) 1,332 (8.5)	< 0.001

S1026

General Use and Education Surrounding Endocannabinoids for Inflammatory Bowel Disease

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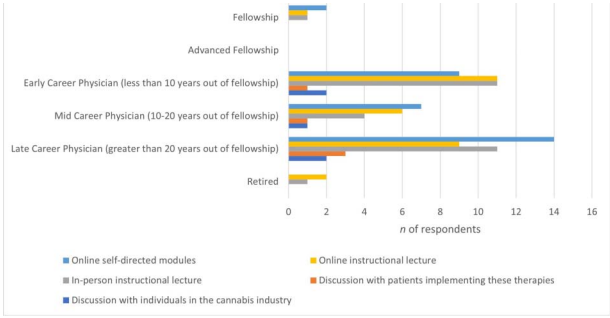
Introduction: In an era of decriminalization and expanded access, the use of endocannabinoids, namely marijuana and non-pharmaceuticals, for symptom control of IBD has increased amongst the general public[1]. We hypothesize that there is an increasing knowledge gap for U.S. Gastroenterologists on how to best advise and prescribe in this realm. This represents the first survey of U.S. Gastroenterologists on current knowledge gaps regarding endocannabinoids in relation to IBD.
Methods: A simple non-random probability sampling survey was distributed to American College of Gastroenterology (ACG) active membership in fellowship training and beyond. Participants answered a series of six demographic questions, and nine investigative questions regarding their current knowledge surrounding endocannabinoids, existing prescription practices, and desire for opportunities for further educational development. Respondents were able to answer all, or their preferred choice of questions.
Results: In total, 76 gastroenterologists were surveyed. There were no statistically significant geographical, gender based, or stage of practice variations ($p > 0.05$). Findings are displayed in Table. These results are unsurprising as only 37% of surveyed gastroenterologists reported receiving any formal education on these topics. 86% of respondents stated that they would be interested in learning more about endocannabinoid directed adjunctive therapy for patients with IBD. A breakdown of how U.S. based Gastroenterologists would like to receive this education is outlined in Figure.
Conclusion: In a backdrop of increased acceptance and use amongst patients, our survey indicates that there remains a significant knowledge gap amongst U.S. Gastroenterologists regarding the function and physiology of the Endocannabinoid System and the existing research as it relates to modulating disease and symptom activity, and more generally, current treatment options. Fortunately, there is a strong desire amongst U.S Gastroenterologists to learn more about this topic, and therefore an opportunity ripe for educational development. It is our hope that this survey aids in the formation of targeted educational interventions that can be tailored to this diverse group of physicians to help with improve patient outcomes and the natural history of inflammatory bowel disease.

Table 1. **Respondent Results Surrounding Endocannabinoids and IBD**

Knowledge surrounding endocannabinoids	n	%
% Correct endocannabinoid receptor pathways identified	33/57	57.9
% Correct ECS receptor activation and side effects	22/57	38.6
% Correct disease/symptom modulating effects in IBD	32/57	56.1
% Correct currently available endocannabinoid products/therapies	23/58	39.7
Current practice surrounding endocannabinoids and IBD		
Ask patient if they are using cannabis, tetrahydrocannabinol, cannabidiol, or other derived products specifically for IBD symptoms	38/59	64.4
Review methods of use (inhalation, ingestions, etc.)	20/59	33.9
Discuss endocannabinoid directed therapy for ongoing IBD symptoms	10/59	16.9
Steer patients who may clinically benefit from these therapies to appropriate procurement sites and resources	12/59	20.3
Barriers to use in their practice		
"Uncertain of the risks vs. benefits of endocannabinoids" or "not comfortable counseling"	36/59	61.1
"Uncertain who would be a good candidate for endocannabinoid use, or who would be at higher risk of adverse effects"	34/59	57.6
"Uncertain when to use this therapy in conjunction with 'traditional' treatments"	33/59	55.9
"Uncertain when in patient's disease course to counsel them on this type of therapy"	24/59	40.7
Regulatory landscape		
Reported good grasp about regulations/statutes surrounding endocannabinoids in their practice area	6/59	10.1
Reported not knowing where to get information on this topic	23/59	38.9



[1026] **Figure 1.** Preferred modality of formal education on endocannabinoid system by stage of practice

REFERENCE
1. Gerich M. et al. Am J Gastroenterol. Feb 2015, p208-14

S1027

Short Bowel Syndrome Is Associated With Increased Morbidity and Health-Care Utilization but Not Mortality in Patients Hospitalized for Crohn's Disease Flare: Analysis From National Inpatient Database

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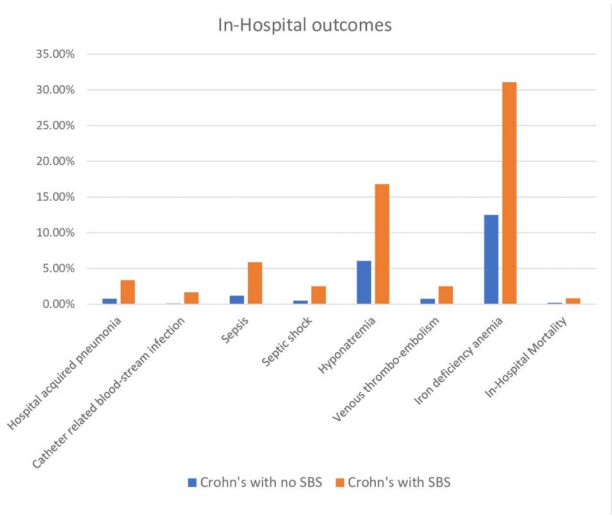
Introduction: Crohn's disease is an inflammatory disorder of the gastrointestinal tract that can affect any part of the tract, ranging from the mouth to the perianal area. Depending on the location and severity of inflammation, small bowel resections might be necessary to control disease. Short Bowel Syndrome (SBS) is a common complication arising after extensive bowel resection, especially in medically refractory Crohn's disease. These patients are at a high risk of adverse outcomes when hospitalized. The aim of this study was to analyze the impact of SBS for patients hospitalized for Crohn's disease flare.
Methods: All adult hospitalized patients from January 2016 to December 2019 in the nationwide inpatient sample (NIS) were captured. The sample population included all patients with a primary diagnosis of Crohn's disease using ICD-10 codes (International Classification of Diseases, tenth edition). We then identified patients with a secondary diagnosis of SBS. The Crohn's disease population was divided into patients with SBS (study group) and without SBS (control group). Linear regression was used for comparing continuous variables and Chi-square tests for categorical variables. Morbidity, mortality and healthcare utilization were analyzed using multivariate logistic and linear regression models where appropriate.
Results: The sample size included 374,745 patients admitted for Crohn's disease flare, of which 99.75% did not have underlying SBS while 0.25% did. Study group had a higher incidence of Hospital-acquired pneumonia (Adjusted OR (aOR) =2.93), Catheter related blood-stream infection (aOR=7.71) and Sepsis (aOR=2.99), all with p< 0.05 or less. There was also a higher risk of hyponatremia (aOR=1.79) and Iron-deficiency anemia (aOR=1.68) in the study group. No difference was noted in venous thromboembolism rates. The adjusted mean change in hospitalization charge was $44,359 and mean change in length of stay was 6.35 days in study group vs control. Mortality though was higher in SBS group, this lost significance following multivariate analysis. (Figure)
Conclusion: SBS increases the risk of infections, electrolyte deficiency and anemia in patients admitted for Crohn's disease flare but venous thromboembolism and mortality rates of both groups remains similar. This proves to be a huge burden on both the patients and the healthcare. The outcomes of patients with SBS could be greatly improved by more effective prevention of these complications, and treatment of high-risk Crohn's patients more vigilantly. (Table)

Table 1. **In-hospital outcomes**

Variables	Crohn's with no SBS* (Control)	Crohn's with SBS* (Study)	p-value
Hospital acquired pneumonia	0.78%	3.36%	< **0.001**
	Adjusted odds ratio[1]=2.93		**0.042**
Catheter related blood-stream infection	0.1%	1.68%	< **0.001**
	Adjusted odds ratio1=7.71		**0.005**
Sepsis	1.19%%	5.88%	< **0.001**
	Adjusted odds ratio[1]=2.99		**0.006**
Septic shock	0.51%	2.52%	**0.002**
	Adjusted odds ratio[1] = 2.36		0.15
Hyponatremia	6.07%	16.81%	< **0.001**
	Adjusted odds ratio[1]=1.79		**0.02**
Venous thrombo-embolism	0.77%	2.52%	**0.02**
	Adjusted odds ratio[1]=1.84		0.29
Iron deficiency anemia	12.49%	31.09%	< **0.001**
	Adjusted odds ratio[1]=1.68		**0.045**
Mean total hospitalization charge ($)	$44,911	$100,203	< **0.001**
	Mean change in charges[1] = $44,359		< **0.001**
Mean length of stay (days)	4.78	12.53	< **0.001**
	Mean change in length of stay[1] = 6.35		< **0.001**
In-hospital mortality	0.2%	0.84%	0.11
	Adjusted odds ratio[1]=2.44		0.39

*SBS- Short Bowel Syndrome 1Adjusted for Age, Sex, Race, income, hospital characteristics and Elixhauser score.



[1027] **Figure 1.** Graph 1.

S1028

Symptoms and Laboratory Values as Proxies for Endoscopic and Histologic Clinical Endpoints in Ulcerative Colitis: A Mediation Analysis Based on Upadacitinib Phase 3 Induction Trials

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Introduction: We evaluate the extent to which commonly available measures in clinical practice (i.e., signs, symptoms, and laboratory values) mediate endoscopy-based clinical measures.
Methods: We analyzed, in the intent-to-treat population from upadacitinib's (UPA) phase 3 induction trials (U-ACHIEVE Induction, U-ACCOMPLISH in moderately to severely active UC, relationships between deep mucosal healing (DMH), histologic endoscopic mucosal improvement (HEMI), and change from baseline in endoscopic score as outcomes, and signs/symptoms and lab values as mediators (fecal calprotectin, high sensitivity C-reactive protein [hs-CRP], abdominal pain [AP], bowel urgency [BU], and Partial Adapted Mayo Score [PA-Mayo]). The mediated proportion of effect at week (wk) 8 was calculated as the difference in mean outcomes due to a one-unit change in mediators while controlling for baseline characteristics.The effects of mediators at wks 2 and 8 were assessed. Analyses assumed mediators were unrelated to each other and used linear models for all variables. Missing values for DMH and HEMI at wk 8 were imputed via non-responder imputation per trial protocol, while other variables were analyzed as-observed. Standard errors were computed via bootstrap.
Results: A total of 878 patients were included; mean (standard deviation [SD]) age was 42.9 (14.4) years and disease duration was 8.0 (7.2) years. At wk 8, 9.0% of patients achieved DMH and 25.7% achieved HEMI, and mean (SD) change from baseline of the endoscopic score was -0.70 (0.97). All outcomes were mediated by PA-Mayo and BU (Table). PA-Mayo mediated around a third of the total effect for all outcomes with similar mediation at wk 2 and 8 (all P< 0.05). The proportion mediated by BU was larger at wk 8 and ranged from one to two thirds of the total effect (all P< 0.05 except for wk 2 for DMH). In contrast, hs-CRP at wk 2 only mediated 2-3% across outcomes (all P< 0.05). The predictive power of the models was similar using wk 2 and 8 mediators and explained 15% (DMH), 40% (HEMI), and 50% (endoscopic score) of variation.
Conclusion: Our study found that easily accessible measures such as Partial Adapted Mayo Score and bowel urgency can mediate endoscopy-based endpoints for UC as early as wk 2 of induction, with mediation effects persisting for concurrently assessed signs and symptoms. Our findings suggests that symptom-based measures for UC in clinical practice could be useful proxies for endoscopic and histologic outcomes.

Table 1. Proportion mediated as estimated from mediation analyses for week 8 outcomes using week 2 or week 8 mediators

	Deep mucosal healing[c]		HEMI[d]		Change from baseline in endoscopic score	
Variance explained	Week 2 (R^2= 0.15[b])	Week 8 (R^2= 0.15 [b])	Week 2 (R^2= 0.39 [b])	Week 8 (R^2= 0.40 [b])	Week 2 (R^2= 0.50 [b])	Week 8 (R^2= 0.52 [b])
Bowel urgency, proportion mediated, %[a]	30.2	66.2*	48.12*	49.4*	37.4*	45.1*
Partial Adapted Mayo Score, proportion mediated, %[a]	33.6*	30.1*	34.6*	33.2*	27.6*	29.1*
Abdominal pain, proportion mediated, %[a]	-4.3	-17.4	-13.7	0.4	-5.1	-5.0
hs-CRP (mg/L), proportion mediated, %[a]	1.8*	-0.1	2.6*	1.3	2.3*	1.3
Fecal calprotectin (mg/kg), proportion mediated, %[a]	-0.0	-1.7	-0.0	-1.6	-0.2	-1.9

Abbreviations: HEMI: Histologic Endoscopic Mucosal Improvement, hs-CRP: High sensitivity C-reactive protein.
* denotes statistical significance (alpha < 0.05).
Note: [a] Proportion mediated denotes the proportion of the mediated effect of changing one unit of the mediator relative to the total effect; for fecal calprotectin, a change of 100 mg/kg was considered.
[b] The R^2 was calculated for the model regressing the outcome on all control variables and all mediators.
[c] Deep mucosal healing was defined as endoscopic score of 0 and Geboes score < 2.0.
[d] HEMI was defined as endoscopic score of 0 or 1 and Geboes score ≤ 3.1.

S1029

Ulcerative Colitis in Low and Lower-Middle Income Countries: A Scoping Review

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Introduction: Ulcerative Colitis (UC) is a chronic inflammatory bowel disease that is emerging as a global burden. Due to the lack of disease registries and diagnostic capacity in low and lower-middle-income countries (LLMICs), the epidemiology and care of UC have not been well established in LLMICs. The aim of this study was to determine the burden, diagnostic and treatment capacity, and challenges or barriers to individuals with UC and their providers in LLMICs.

Methods: We utilized a full search strategy in PubMed, Embase, and World Health Organization (WHO) Global IndexMedicus for data collection. The titles and abstracts of all the publications were screened and reviewed by two independent reviewers. A descriptive review of the relevant data extracted from the selected publications was analyzed in Excel.

Results: A total of 4,601 publications were extracted from the database search and 483 relevant studies were included in this review. Only 24 of all the 82 LLMICs (29.26 %) have published data on individuals with UC. Overall, the highest number of studies came from Iran, followed by India, and Tunisia. The mean number of UC patients reported per study is 139.72 and the median is 60, with a wide range from 1-3232. The reported UC prevalence, incidence, and mortality in the included studies are rare and vary greatly, ranging from 0.1 to 46.7 per 100,000, 0.5 to 23.7 per 100,000, and 0.16% to 1.3% respectively. Of the 483 publications describing cases of UC, 133 proposed at least one diagnostic, management, access, or financial barrier to individuals with UC and providers. Low disease index suspicion leading to under-diagnosis, difficulty differentiating between UC and Crohn's disease and other infectious causes, and lack of trained personnel, as well as reliable tests, were reported as diagnostic challenges in the studies. The most notable patient barriers were lack of education or knowledge about the disease, lack of access to quality service and UC medications, psychological factors, and religious beliefs. Financial barriers were reported frequently which included the high cost of diagnostic testing and biologics. (Figure)

Conclusion: The prevalence of UC is increasing worldwide and this scoping review has highlighted the challenges faced by the patients and providers in LLMICs. In the future, it is imperative for further population-based studies and literature to establish the burden of UC in the world's most resource-poor- countries where there is a substantial lack of knowledge and underdiagnosis of UC. (Table)

Table 1. Mean and range number of cases of ulcerative colitis reported by each study included in the review, overall, by region, and by low and lower-middle income countries

Region/Country	Number of studies	Total number of cases	Mean	Median	Range
Overall	483	68320	139.72	60	1-3232
South Asia					
Bangladesh	5	241	48.2	12	1-164
India	160	37679	2597.19	64.5	1-3232
Indonesia	2	87	43.5	43.5	1-86
Nepal	9	468	52	2	1-416
Pakistan	17	1560	91.76	54	1-550
Sri Lanka	10	1544	154.4	146.5	16-348
Middle East and North Africa					
Algeria	3	78	39	39	1-46
Egypt	28	2174	77.64	28	1-896
Iran	170	21676	125	75	1-1914
Morocco	10	418	41.8	32	1-110
Syria	3	3	1	1	0
Tunisia	36	1944	247.8	59	1-202
Sub-Saharan Africa					
Burkina Faso	1	6	6	6	0
Ethiopia	1	5	5	5	0
Ghana	4	55	13.75	12.5	6-24
Kenya	1	4	4	4	0
Nigeria	14	63	4.5	3	1-20
Sudan	3	101	33.66	16	12-73
Tanzania	1	1	1	1	0
Togo	1	4	4	4	0
Uganda	1	4	4	4	0
Zimbabwe	5	28	5.6	8	1-10
Central Asia					
Uzbekistan	1	167	167	167	0
Latin America and the Caribbean					
Bolivia	1	10	10	10	0

Figure A) Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) flow diagram depicting numbers of studies identified and excluded at each stage of the review process.

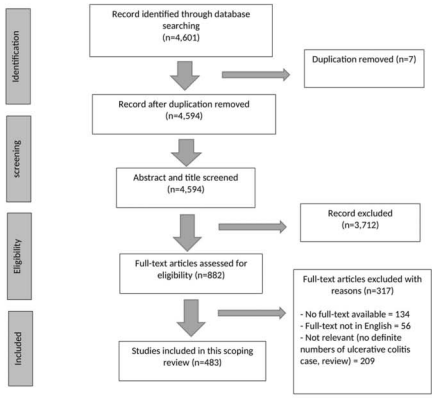


Figure B

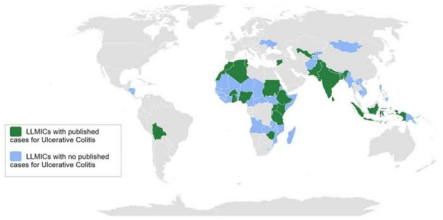


Figure C

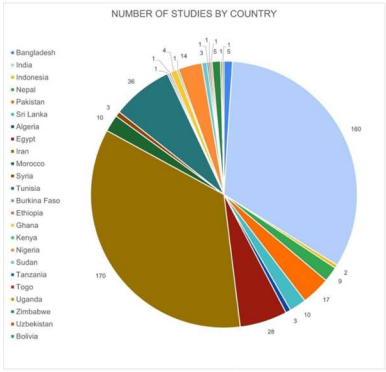
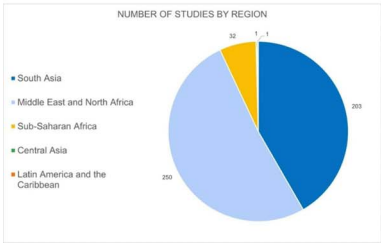


Figure D



[1029] **Figure 1.** A: Flow diagram depicting number of studies identified and excluded at each stage of the review process B: Map of LLMICs with published and no published cases of ulcerative colitis C: Number of studies by country D: Number of studies by region

S1030

Adalimumab Is Not Superior to Azathioprine in the Prevention of Postoperative Crohn's Disease Recurrence: A Systematic Review and Meta-Analysis

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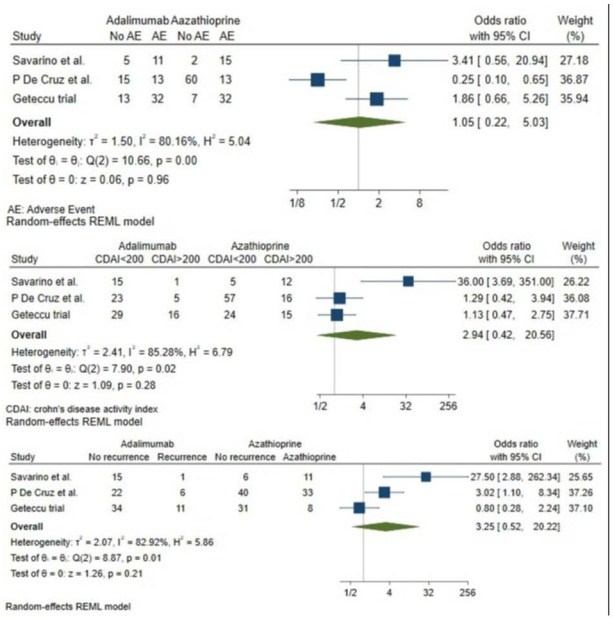
Introduction: Postoperative recurrence of Crohn's disease is estimated approximately up to 50%. Postoperative prophylactic therapy is implemented for Crohn's disease to reduce both clinical and endoscopic recurrence. We conducted a systematic review and meta-analysis comparing adalimumab to azathioprine in the prophylaxis of postoperative Crohn's disease recurrence.
Methods: We conducted a systematic search of the PubMed database from inception through 2017 for studies comparing adalimumab to azathioprine using the terms "Adalimumab", "azathioprine", "postoperative Crohn's disease" and "post-surgical resection Crohn's". Relevant data were extracted and analyzed using Comprehensive Meta-Analysis software. The random-effects model was used for all variables, and publication bias was assessed using Egger's test.
Results: Three randomized controlled trials published between 2013 and 2017, examining a total of 218 patients, were included in our analysis. Out of the 218 patients, 118 were males and 100 were females, and the recurrence rate was reported as 6.3%, 21% and 29.7% in the adalimumab group compared to 64.7%, 45%, and 33.3% in the azathioprine among the three clinical trials. We found no difference between adalimumab and azathioprine in the prevention of postoperative disease recurrence by looking at endoscopic recurrence in this analysis which is the primary endpoint with a risk ratio of 3.25 (95% CI 0.52 to 20.22) (I^2=82.92%). We also found no significant difference in total adverse effects between the two medications with an estimated risk ratio of 1.05 (95% CI 0.22 to 5.03) (I^2=80.16%), in addition, no significant difference was found in postoperative CDAI between adalimumab and azathioprine with a respective risk ratio of 2.94 (95% CI 0.42 to 20.56) (I^2=85.28%).
Conclusion: Our results suggest that adalimumab is not superior to azathioprine in the prevention of postoperative disease recurrence with no difference in total adverse events.
Clinical implication: No difference between adalimumab and azathioprine in the prevention of postoperative disease recurrence.



[1030] **Figure 1.** Adalimumab VS Azathioprine

S1031

Association Between Nutritional Profile and Disease Activity in a Sample of Lebanese Patients With Inflammatory Bowel Disease (IBD): A Case Control Study

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Introduction: Many studies have evaluated dietary habits of patients with inflammatory bowel disease (IBD) and their impact on disease activity. This study aims to evaluate this association in Lebanese patients with IBD, as no investigation of this kind has been done in Lebanon.
Methods: In this prospective study, patients with IBD were identified by their treating physicians while controls were recruited via emails sent to staff and students at the affiliated university. Both groups were gender and age matched. Baseline characteristics and nutritional profile, as assessed using a validated food frequency questionnaire (FFQ) adapted to the Lebanese diet were compared between cases and controls. Cases were divided into 2 groups, those in remission and those with active disease according to the Harvey-Bradshaw Index for Crohn's disease (HBCD) and Ulcerative Colitis Activity Index (UCAI).
Results: A total of 47 patients with IBD and 101 controls were included. There was no difference in mean age between cases and controls. Patients with IBD consumed significantly less % of lipids, saturated fatty acids (SFAs), fiber, and sucrose compared to controls (p=0.0001). The multivariate analysis comparing cases to controls showed higher odds of consuming more % carbohydrates of total energy intake (TEI) at 1.31 (95%CI; 1.15-1.51) and more % proteins of TEI at 1.25 (95%CI;1.09-1.43), and lower odds of consuming fiber at 0.934 (95%CI;0.89-0.99). There was no difference in odds of fat consumption between cases and controls. Of 47 IBD patients, 25 UC and 22 CD, 28 were in clinical remission (HBCD ≤ 4 or UCAI ≤ 2) and 19 had active disease. IBD patients in remission consumed more % protein than controls (p=0.032). The % intake of poly-unsaturated fatty acids (PUFAs) was higher among IBD patients with active disease than those in remission, specifically among those with UC (p=0.032).
Conclusion: Although there was a difference in protein consumption between cases and controls, it was only significant between controls and IBD patients in remission. It is possible that differences in diet between patients with IBD and controls were associated with nutritional restrictions patients impose on themselves. In contrast, consumption of PUFAs was associated with active disease in IBD patients, which concords with the available literature. This study could serve as a steppingstone for future prospective and experimental studies that could inform nutritional rehabilitation for IBD patients (Table).

Table 1. **Energy Intake, Macronutrients and Micronutrients Per Day in Controls, IBD Patients in Remission and IBD Patients with Active Disease**

	Controls (n=101)	IBD patients in Remission (n=28)	IBD patients with active disease (n=19)	p-value	DRI
Energy Intake (kcals/day) for men	2622.4 ± 0.21	1923.53 ± 0.16	1644.37 ± 0.03	0.015	2300-2900
Energy Intake (kcals/day) for women	2597.2 ± 0.17	1563.15 ± 0.05	1897.14 ± 0.13	0.0001	1900-2200
BMI (kg/m2)	23.29 ± 0.06	25.87 ± 0.06	24.03 ± 0.08	0.007	N/A
Average (%) of Protein of TEI	16.06 ± 0.09	18.62 ± 0.05	16.48 ± 0.08	0.004	10-35

Table 1. (*continued*)

	Controls (n=101)	IBD patients in Remission (n=28)	IBD patients with active disease (n=19)	p-value	DRI
Average (%) of Lipids of TEI	38.33 ± 0.08	30.28 ± 0.06	33.02 ± 0.07	0.0001	20-35
MUFAs (%)	12.33 ± 0.11	11.52 ± 0.06	11.04 ± 0.12	0.119	15-20
PUFAs (%)	6.05 ± 0.15	5.14 ± 0.10	6.58 ± 0.12	0.032	5-10
SFAs (%)	11.95 ± 0.12	6.50 ± 0.14	6.84 ± 0.14	0.0001	< 10
Average (%) of carbohydrates of TEI	45.15 ± 0.05	50.68 ± 0.03	49.30 ± 0.05	0.0001	45-65
Average Sucrose (g)	89.16 ± 0.21	43.89 ± 0.22	52.70 ± 0.21	0.0001	50
Average Lactose (g)	5.60 ± 0.59	5.17 ± 0.44	5.17 ± 0.44	0.942	N/A
Average Fibers (g)	28.09 ± 0.18	18.02 ± 0.10	21.52 ± 0.20	0.0001	20-38
Alcohol (yes), n (%)	22 (23.9%)	4 (14.3%)	6 (31.6)	0.918	N/A
Vitamin D supplementation (yes), n (%)	15 (14.9%)	13 (46.4%)	5 (26.3%)	0.006	N/A

Categorical variables were reported as numbers and percentages, test used: chi-square test. Continuous variables were reported as geometric means ± Standard deviation, test used: independent t-test. p<0.05. IBD= Inflammatory Bowel Diseases, DRI= Daily Recommended Intake, BMI= Body Mass Index, TEI= Total Energy Intake, MUFAs= Mono-unsaturated Fatty Acids, PUFAs= Poly-unsaturated Fatty Acids, SFAs= Saturated Fatty Acids, N/A= Not applicable.

S1032

Clostridium difficile Infection in Inflammatory Bowel Disease, Risk Analysis and Determination of Complications Based on Nationwide Inpatient Sample Database

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Introduction: Inflammatory bowel disease (IBD) mainly consists of Ulcerative colitis (UC) and Crohn's Disease (CD) affects over 3 million US adults. IBD patients tend to have a higher risk of infection due to inflammation, altered mucosal barrier, and immunosuppressive medications. Clostridium difficile infection (CDI) is one of the most common infections associated with IBD. Our aim was to assess the outcomes of inpatient admissions of IBD who have concurrent CDI.

Methods: We utilized the Nationwide Inpatient Sample (NIS) database from 2018 and 2019. Adult hospitalizations due to IBD with and without CDI were identified by previously validated ICD-10-CM codes. We used propensity score matching to balance the difference in baseline characteristics and comorbidities. Univariate and multivariate logistic regression for categorical variables and linear regression for continuous variables was carried out to identify independent associations at $p < 0.05$. Statistical Analysis was performed using R studio.

Results: A total of 102,920 patients were included in the study with IBD-related hospitalization. 25,730 patients with IBD had CDI of which 14,995 (58%) were females. IBD patients with CDI had an increased crude mortality rate of 3.3% vs 1.4% in IBD patients without CDI ($p < 0.001$) (Table). A higher proportion of IBD patients with CDI were on immunosuppressive medications 8.4% vs 6.7% ($p< 0.01$) in IBD patients without CDI. IBD patients with CDI have significantly higher rates of acute kidney injury, cardiovascular shock, and acute respiratory failure requiring mechanical ventilation. On multivariate analysis, IBD patients with CDI had 2 fold greater risk of death (OR 2.32, 95% CI: 1.89–2.84); more than 2 fold greater risk of a shock (OR 2.7, 95% CI: 2.36–3.08); higher risk of requiring ICU level of care (Table 2). Total adjusted charges are higher in IBD with CDI ($44,413) compared to without CDI ($32,224). The median length of stay is higher in IBD patients with CDI (5 days) compared to those without CDI (3 days) (Table 1).

Conclusion: IBD patients with CDI have a higher crude mortality rate, end-organ damage leading to severe CDI, and increased healthcare resource utilization. Early diagnosis of CDI, judicious use of antibiotics, and immunosuppressive medications should be recommended in IBD patients. IBD patients on immunosuppressive medications have a higher risk of CDI. Further research is needed for the reduction of morbidity and mortality in IBD patients with CDI.

Table 1. **Basic demographics and complications in hospitalized IBD patients with and without CDI**

Table 1. Basic Demographics Variable	IBD with No CDI, N = 77,190	IBD with CDI N = 25,730	p-value
Age in years at admission	56 (39, 71)	57 (37, 72)	>0.9
Gender			0.006
Male	34,010 (44%)	10,770 (42%)	
Female	43,175 (56%)	14,955 (58%)	
YEAR			>0.9
2018	40,230 (52%)	13,410 (52%)	
2019	36,960 (48%)	12,320 (48%)	
Immunosuppressive Medications	5,210 (6.7%)	2,150 (8.4%)	< 0.001
Sepsis	770 (1.0%)	315 (1.2%)	0.2
Shock	2,510 (3.3%)	2,140 (8.3%)	< 0.001
AKI	13,515 (18%)	6,115 (24%)	< 0.001
Mechanical_Ventilation	1,355 (1.8%)	635 (2.5%)	0.001
Vasopressor_Use	665 (0.9%)	390 (1.5%)	< 0.001
Toxic Megacolon	255 (0.3%)	90 (0.3%)	0.8
Total charge adjusted ($)	$32,224 (18,089-62,305)	$44,413 (24,539-88,884)	< 0.001
Inpatient Mortality	1,115 (1.4%)	845 (3.3%)	< 0.001
Length of Stay (median, IQR, days)	3.0 (2.0, 6.0)	5.0 (3.0, 9.0)	< 0.001

Table 2. **Mortality and outcome of hospitalized IBD patients with and without CDI**

Table 2. Outcomes (Multivariate Analysis)		
	Adjusted Odds Ratio	95% Confidence Interval
Inpatient Mortality	2.32	1.89 - 2.84
Shock	2.7	2.36 - 3.08
Mechanical_Ventilation	1.41	1.14 - .75
Vasopressor_Use	1.77	1.33 - 2.34
Length of Stay	1.05	1.04-1.06

S1033

Upending Ustekinumab: IV Dosing as Maintenance Dosing

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Introduction: Ustekinumab is indicated for moderate to severe Crohn's disease (CD) patients who failed previous treatment. Standard dosing is combining a single intravenous (IV) weight-based induction with subcutaneous (subQ) maintenance every 8 weeks. Although effective, secondary loss of response occurs despite dose optimization. Our aim was to evaluate the safety and effectiveness of Ustekinumab re-induction and IV maintenance in patients with refractory CD.
Methods: We identified four individuals with CD at a single tertiary Veterans Affairs medical center. Each patient received IV induction with Ustekinumab after failed previous treatment with corticosteroids and anti-TNF inhibitors. Following transition to subQ maintenance dosing, these individuals had loss or inadequate response as seen with objective measures (C-reactive protein, fecal calprotectin, endoscopy, radiography). Despite dose optimization to every four weeks, drug trough levels remained subtherapeutic (< 4.5 μg/dL) with ongoing active disease. As salvage therapy, these patients then received weight-based IV maintenance dosing every four weeks. Disease activity was reassessed after three months.
Results: All achieved endoscopic and/or radiographic remission with therapeutic drug troughs. No adverse effects were reported.
Conclusion: In our early observation, ustekinumab re-induction with continued IV maintenance was a safe and effective treatment. This novel approach may be an option for patients with a loss or inadequate response to standard ustekinumab therapy. Our sample size is small, so our study may be underpowered; however, data collection is ongoing.

S1034

Adherence to Venous Thromboembolism Prophylaxis in Hospitalized Patients With Inflammatory Bowel Disease Cared for in a Safety Net Hospital

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Introduction: Patients with inflammatory bowel disease (IBD) are at 3-fold increased risk for developing venous thromboembolism (VTE) compared with patients without IBD. VTE events have been associated with poorer outcomes in patients with IBD and carry significant morbidity and mortality. Despite guidelines recommending the use of VTE prophylaxis in patients hospitalized with IBD flares, there is minimal data on the VTE prophylaxis adherence rate in underserved IBD patients. The aim of this study is to determine the rates of pharmacologic VTE prophylaxis in flaring IBD patients hospitalized in a safety net hospital and to determine factors associated with non-adherence.
Methods: We performed a retrospective analysis of IBD patients hospitalized with a flare of symptoms between January 1, 2018 and December 31, 2020. Data abstraction included patient demographics, disease characteristics, medication use, medical comorbidities, in addition to characteristics during hospitalization including laboratory data. The medical records were reviewed to determine if pharmacologic prophylaxis was used and administered. A stepwise logistic regression was performed to identify independent predictors for the primary outcome. A univariate and multivariate logistic regression analysis was performed to determine factors associated with adherence of chemical VTE prophylaxis in this cohort.
Results: A total of 178 encounters in 92 individual patients (59.8% CD; 40.2% UC) were evaluated. In this cohort of patients, 50.0% were Hispanic, 21.7% were Black, and 6.5% were White (Table). The overall VTE pharmacologic prophylaxis rate of the total 178 encounters was 45.5% (81 encounters). In the multiple logistic regression analysis, being on a primary surgical service was associated with adherence to VTE prophylaxis (OR 12.75 [CI 1.56-104.47], p = 0.02) with a trend towards significance in female patients (OR 0.55 [CI 0.29 - 1.03], p = 0.06) (Table 2).
Conclusion: In IBD patients hospitalized with a flare, adherence to VTE prophylaxis was low at 45.5%. In multivariate analysis, the major predictor of non-adherence to VTE prophylaxis was primary admitting service. Quality improvement interventions are needed to improve adherence to VTE prophylaxis and prevent morbidity and mortality in this vulnerable population.

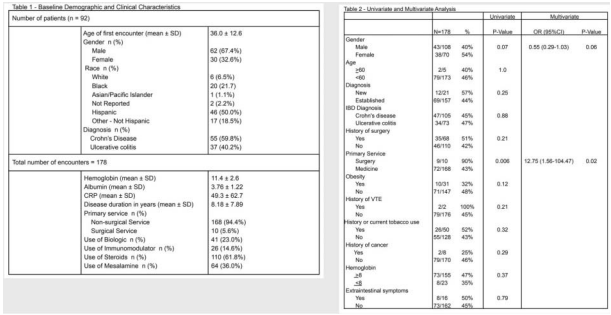
Table 1 - Baseline Demographic and Clinical Characteristics

Number of patients (n = 92)		
	Age of first encounter (mean ± SD)	36.0 ± 12.6
	Gender n (%)	
	Male	62 (67.4%)
	Female	30 (32.6%)
	Race n (%)	
	White	6 (6.5%)
	Black	20 (21.7)
	Asian/Pacific Islander	1 (1.1%)
	Not Reported	2 (2.2%)
	Hispanic	46 (50.0%)
	Other - Not Hispanic	17 (18.5%)
	Diagnosis n (%)	
	Crohn's Disease	55 (59.8%)
	Ulcerative colitis	37 (40.2%)
Total number of encounters = 178		
	Hemoglobin (mean ± SD)	11.4 ± 2.6
	Albumin (mean ± SD)	3.76 ± 1.22
	CRP (mean ± SD)	49.3 ± 62.7
	Disease duration in years (mean ± SD)	8.18 ± 7.89
	Primary service n (%)	
	Non-surgical Service	168 (94.4%)
	Surgical Service	10 (5.6%)
	Use of Biologic n (%)	41 (23.0%)
	Use of Immunomodulator n (%)	26 (14.6%)
	Use of Steroids n (%)	110 (61.8%)
	Use of Mesalamine n (%)	64 (36.0%)

Table 2 - Univariate and Multivariate Analysis

			Univariate	Multivariate	
	N=178	%	P-Value	OR (95%CI)	P-Value
Gender					
Male	43/108	40%	0.07	0.55 (0.29-1.03)	0.06
Female	38/70	54%			
Age					
≥60	2/5	40%	1.0		
<60	79/173	46%			
Diagnosis					
New	12/21	57%	0.25		
Established	69/157	44%			
IBD Diagnosis					
Crohn's disease	47/105	45%	0.88		
Ulcerative colitis	34/73	47%			
History of surgery					
Yes	35/68	51%	0.21		
No	46/110	42%			
Primary Service					
Surgery	9/10	90%	0.006	12.75 (1.56-104.47)	0.02
Medicine	72/168	43%			
Obesity					
Yes	10/31	32%	0.12		
No	71/147	48%			
History of VTE					
Yes	2/2	100%	0.21		
No	79/176	45%			
History or current tobacco use					
Yes	26/50	52%	0.32		
No	55/128	43%			
History of cancer					
Yes	2/8	25%	0.29		
No	79/170	46%			
Hemoglobin					
≥8	73/155	47%	0.37		
<8	8/23	35%			
Extraintestinal symptoms					
Yes	8/16	50%	0.79		
No	73/162	45%			

[1034] **Figure 1.** Tables

S1035

Press Releases of Inflammatory Bowel Disease Research Are Frequently Misleading

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Introduction: Press releases (PRs) from universities or academic medical centers sent to print or online media are acommon strategy to transmit research to the public, other scholars and potential donors. At times, the goal may be publicity at the expense of accuracy. Data indicate that as many as one-third of medical news stories rely exclusively or largely on PRs from potentially prejudiced sources. At best, some

PRs are over-hyped and, at worst, misleading. PRs describing inflammatory bowel disease (IBD) research can exaggerate the impact of specific studies, omit vital facts and overstate or misrepresent strengths while downplaying or ignoring limitations or harms.
Methods: We identified all PRs from Eureka Alert, the major online database for scientific PRs(www.eurekalert.org) from 1/1/14 to 12/31/20, using the search strategy: <"Crohn disease" > or <"ulcerative colitis" or <"inflammatory bowel disease">. PRs reported research in peer-reviewed scientific journals in English minimum word count of 200. Pre-study, assessment criteria were established, including: definitions of linguistic spin; misinformation; misleading reporting, titles or quotes; claims of safety without evidence; extrapolation to unstudied groups, interventions or outcomes; and if a PR discussed study weaknesses/limitations. Inter-author disagreements were adjudicated to achieve consensus.
Results: We included 104 PRs: 43% had inaccurate or hyped titles; none of the 42 in vitro or animalstudies noted the infrequency that such research is translated to human clinical use. Overclaiming in author quotes occurred in 40 %. Study strengths were noted in 87%, but study limitations/weaknesses were infrequent (20%). Half of the PRs had improper extrapolation to unstudied groups, interventions or outcomes.
Conclusion: Typically, PRs are written by publicity or development officers. A study of 165 "health reporters" at 122 daily newspapers revealed that 80 % had no prior training; 40 % agreed that, "most health reporters lack training in health issues". Only one-third felt very confident in reporting medical news. Media can inadvertently or purposefully distort or misrepresent science. For lay readers, scholarly studies require specialized knowledge. Our data indicate that IBD-related PRs are commonly inaccurate or over-optimistic. Real-life medical decisions may be adversely affected by inaccuratePRs.

S1036

Cannabidiol (CBD) Use in Inflammatory Bowel Disease

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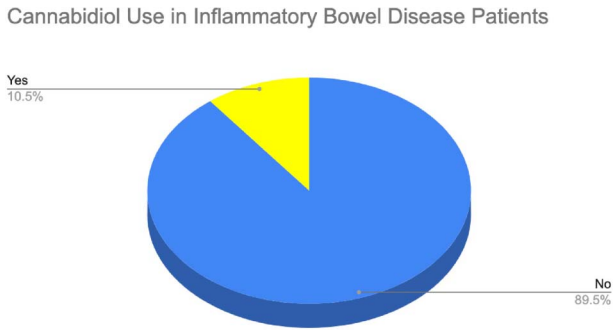
Introduction: Cannabidiol (CBD) is a cannabinoid compound found in cannabis that has been gaining attention over the past few years in the medical community. Unlike tetrahydrocannabinol, also found in cannabis, it does not have psychoactive effects. It is easily obtainable, mixed in an oil or gummy form, and available in different strengths and flavors. CBD is used for pain, anxiety, depression and insomnia. While marijuana use has been widely studied in patients with Inflammatory Bowel Disease (IBD), there are few studies on the use and effects of CBD in this population. The purpose of this survey based study is to determine the number of IBD patients using CBD products, why they use them and if they perceive any benefits.
Methods: 229 patients over the age of 18 with a diagnosis of IBD, from two gastroenterology outpatient clinics in Suffolk county, NY were invited to participate in an anonymous survey from June 1st to June 16th, 2022. The survey consisted of 13 questions pertaining to demographics, IBD related history, cancer history and CBD use. The surveys were completed in the office or by telephone. Data was entered into an anonymous database for interpretation.
Results: Of the 229 patients, 10.5% used CBD products (n=24). Of the CBD users, more than half (66.7%, n=11) were female, 14 had Crohn's disease while the rest had Ulcerative colitis, 37.5% (n=9) were on biologic therapy, and 9 (37.5%) had an IBD related surgery. Anxiety (62.5%, n=15), insomnia (54.2%, n=13) and pain (41.7%, n=10) were the most commonly reported reasons for use of CBD. Increase in appetite (25%, n=6) and nausea and vomiting (20.8%, n=5) were also reasons for use but were not reported as frequently. The majority of patients (87.5 %, n=21) felt that CBD helped their symptoms.
Conclusion: IBD patients frequently suffer from pain, anxiety, insomnia and depression. There has been a rise in the use of CBD products in patients with various medical conditions. In our small study, we found that only 10.5% of IBD patients use CBD products, mainly for anxiety, insomnia and pain, compared with arthritis where reported use is 50% or more. Patients with IBD who have a complicated disease process often seek alternative therapies and are therefore at risk for substance use. Until there are large clinical trials to assess the role and safety profile of CBD in IBD patients, clinicians should be aware of its use in this population.



[1036] **Figure 1.** Cannabidiol (CBD) use in Inflammatory Bowel Disease Patients

S1037

Prevalence and Predictors of Nutritional Deficiencies and Quality of Life in Patients With Ulcerative Colitis

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Introduction: To study the prevalence and predictors of nutritional deficiencies and poor quality of life (QOL) in patients with Ulcerative colitis (UC).
Methods: It was a cross-sectional prospective study where all the patients visiting gastroenterology services over a year diagnosed as UC were evaluated for macronutrient and micronutrient deficiency after informed consent. Patients with significant comorbid conditions were excluded. Cases were defined as patients with UC and controls were healthy relatives of the cases. We used short inflammatory bowel disease questionnaire (SIBDQ) score < 50 as poor QOL.
Results: 126 patients of UC and 57 healthy controls were analysed. The cases and controls were well matched in their demographic and social characteristics. Patients with UC as compared to controls had increased prevalence of being underweight (27.8% v/s 3.50%), low mid-arm-circumference (45.23% v/s 12.28%), weak handgrip strength (66.66% v/s 45.61%) and weak lower limb strength (80.15% v/s 42.10%).They showed higher protein deficiency (30.95% v/s 3.50%), albumin-deficiency (25.39% v/s 0%) and cholesterol-deficiency (62.69% v/s 28.07%). Micronutrient deficiency was also significantly more prevalent in patients: calcium-deficiency (44.44% v/s 5.26%) and phosphate-deficiency (20.63% v/s 1.75%). UC patients had high prevalence of other micronutrient deficiencies – Iron-deficiency (87.3%), Folate-deficiency (15.9%), Vitamin B12 deficiency (10.3%) and vitamin D-deficiency(< 11 ng/ml) (19.8%). Serum albumin and iron deficiency emerged as independent predictors of serum calcium-deficiency with OR of 6.8 and 13.4 respectively. Serum folate-deficiency emerged as independent predictor of magnesium-deficiency with OR of 3.93. Serum calcium emerged as independent predictor of serum iron-deficiency with OR of 11.56. Serum albumin-deficiency emerged as independent predictor of vitamin D-deficiency with OR of 4.43. 85 (67.46%) of patients had poor quality of life by SIBDQ questionnaire. Vitamin D (r=0.275), and albumin levels (r=0.399) positively correlated with QOL. Vitamin D-insufficiency (< 32 ng/ml) and histologically active disease by Robarts histological score >3 emerged as independent predictors of poor QOL with OR of 6.0 and 4.0 respectively.
Conclusion: Micro and macro-nutrient deficiencies are more prevalent in patients with UC than healthy controls. Albumin levels correlated well with micronutrient deficiencies and QOL. Vitamin D-insufficiency and histologically active disease predict the poor QOL.

S1038

A Pooled Analysis of Early and Sustained Response in Patients With IBD With Iron Deficiency Anemia Who Were Treated With Ferric Maltol

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Introduction: Iron deficiency (ID) accounts for around half of the estimated 2.2 billion cases of anemia globally.[1] In western countries about 3.4% of the general population are anemic, and up to 30% of patients with inflammatory bowel disease (IBD) are reported to have ID anemia (IDA).[2]Patients with inflammatory bowel disease (IBD) experience ID associated with chronic gastrointestinal (GI) blood loss, impaired absorption across damaged bowel mucosa, and inflammation-associated downregulation of absorption.[1] Ferric maltol (FM) optimizes iron absorption while reducing the GI adverse events compared with traditional oral iron replacement options.[1] Here, we present a novel pooled efficacy assessment of FM in the treatment of IDA at Week 4, to evaluate early response, and at Week 12.
Methods: Data were pooled from the combined phase 3 AEGIS 1 and 2 (301/2) studies, and a phase 3b study (304), which included adults with a diagnosis of Crohn's disease (CD) or ulcerative colitis (UC) and IDA defined as Hb ≥9.5–< 12.0 g/dL for females and ≥9.5–< 13.0 g/dL for males in 301/2 and as Hb ≥8.0–≤11.0 g/dL for women and ≥8.0–≤12.0 g/dL for men in 304. Change in Hb concentration from baseline (BL) was pooled at Week 4 and at Week 12.
Results: In 301/2, the mean age was 39.3 years and 65% were female; 55% had CD and 45% had UC. In 304 the mean age was 40.2 years and 58% were female; 62% had CD and 37% had UC. At Week 4, the 301/2 population (n=59) had a mean improvement in Hb from BL of 1.08 g/dL (95% confidence interval [CI], 0.91–1.25) and the 304 population (n=125) had a mean increase of 1.27 g/dL (95% CI, 1.10–1.44). At Week12, those in 301/2 (n=58) had a mean gain in Hb from BL of 2.26 g/dL (95% CI, 1.96–2.56) and patients in 304 (n=125) had a mean increase of 2.45 g/dL (95% CI, 2.20–2.70). The pooled analysis showed mean increase in Hb from BL of 1.18 g/dL (95% CI, 1.05–1.30) at Week 4 (n=184), and of 2.37 g/dL (95% CI, 2.18–2.57) at Week 12 (n=183).
Conclusion: Patients with IBD and IDA who received FM had a clinically meaningful >1.0 g/dL Hb improvement at Week 4, and a >2.0 g/dL increase at Week 12 in a pooled analysis of three pivotal randomized controlled trials. These findings support physicians in making treatment decisions for patients with IBD and ID.

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2. Voegtlin et al. J Crohns Colitis. 2010;4:642–8.

S1039

Tofacitinib-Associated Adverse Vascular Events Reported to the Federal Adverse Event Reporting System (FAERS) Database

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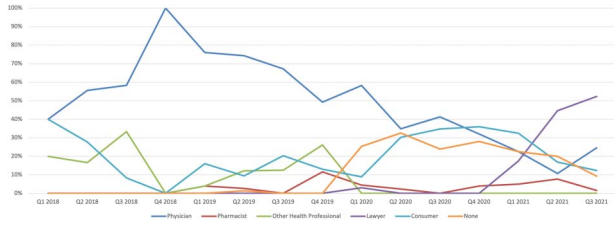
Introduction: Tofacitinib, an intracellular tyrosine kinase (Jak-Kinase) inhibitor, is approved by the U.S. Food and Drug Administration (FDA) for active rheumatoid arthritis (RA), psoriatic arthritis (PsA) and ulcerative colitis (UC). In 2019, the FDA released a safety alert for the risk of blood clots and death in patients receiving tofacitinib. In 2021, Black Box Warnings were issued for low dose (5mg BID) and high dose (10mg BID) tofacitinib, for increased risk of serious heart-related adverse events (AEs) and cancer.
Methods: FAERS is a database of voluntarily reported AEs used for post-marketing surveillance of medications. 8,863,077 FAERS reports from January 2018 to September 2021 were examined. Of these, there were 84,225 reports of tofacitinib-related AEs. Using MeDRA terminology, reports of cardiovascular (CV) AEs emphasized in recent black box warnings (Pulmonary Embolism, Deep Vein Thrombosis, Cerebral Thrombosis, Cerebral Venous Thrombosis, and Cerebral Vascular Occlusion) were reviewed. There were 650 CV AEs reported in the study period. Demographics, cumulative dosage, indications for drug use, outcomes, reactions, and reporter trends were analyzed. Reporter odds ratio (ROR) for all reporting groups (physicians, lawyers, community, pharmacists, etc.) were calculated. ROR >1 indicates interference in reporting.
Results: The most common indication for tofacitinib was RA 43,386 (52%) of reports. Hospitalization occurred in 10,182/84,225 (12.0%) of reports. There were 3,856 (5%) reports when tofacitinib was indicated for UC. 42,671 (51%) of AEs occurred in subjects 36-64 years old. Females represented 65,806 (78%) of reports. Physicians were 13% of reporters while consumers accounted for 59% of reporters, (ROR = 1.52; 95%; CI = 1.49-1.54). CV specific AEs concerning Tofacitinib accounted for 650/84,225 (0.77%) of reports. Lawyer reporting demonstrated a sharp rise in 2021. Lawyer reports accounted for 70/170 (41%) CV AEs in 2021(ROR = 942; 95%; CI = 505-1757).
Conclusion: Interference of the reporting of tofacitinib-related CV AEs to FAERS appears to be occurring, initially by excess consumer reporting and more recently by lawyers. The effect of reporting bias on the use of tofacitinib in the clinical setting requires further investigation.



[1039] **Figure 1.** Tofacitinib Cardiovascular AEs by Reporter Type

S1040

Relationship Between Health-Related Quality of Life and Work Productivity in Patients With Ulcerative Colitis in the Tofacitinib OCTAVE Phase 3 Induction and Maintenance Studies

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Introduction: Tofacitinib is an oral small molecule JAK inhibitor for the treatment of UC. Tofacitinib induction treatment has been shown to improve work productivity in patients (pts) with UC. However, the relationship between health-related quality of life (HRQoL) and work productivity in the tofacitinib OCTAVE clinical program has not been described.
Methods: We aimed to evaluate the relationship between Inflammatory Bowel Disease Questionnaire (IBDQ) domains and Work Productivity and Activity Impairment-Ulcerative Colitis (WPAI-UC) components among pts in Phase 3 studies evaluating tofacitinib as induction or maintenance therapy for UC (OCTAVE Induction 1&2 [NCT01465763; NCT01458951]; OCTAVE Sustain [NCT01458574]). Relationships between IBDQ (total and domain scores) and WPAI-UC components (absenteeism, presenteeism, productivity loss, and activity impairment) were estimated using a repeated measures longitudinal model in which IBDQ domain score was a continuous anchor and WPAI-UC component score was the outcome (i.e., a linear relationship was imposed between the outcome and anchor). In sensitivity analyses, IBDQ domain score was used as a categorical anchor to assess the linearity assumption (which did not impose any functional relationship between outcome and anchor). Productivity loss includes absenteeism and presenteeism and thus is the most comprehensive WPAI-UC component. Analyses used all available pooled data from pts receiving tofacitinib or placebo.
Results: Relationships between IBDQ total score and WPAI-UC components were very similar when using the IBDQ total score as a continuous anchor, compared with a categorical anchor, supporting the linearity assumption. The relationship between IBDQ total score and productivity loss was robust, with IBDQ total scores of 224 and 32 (higher score = better HRQoL) corresponding to a 5.6% (95% CI 3.4, 7.8) and 100.7% (97.3, 104.1) impact, respectively (Table). For every 16-point increase in IBDQ total score, productivity loss (0–100%) improved by 7.9% (7.5, 8.4; Table). Similar trends were observed between IBDQ total score and activity impairment and presenteeism; the relationship with absenteeism was weak. Similar relationships were observed between IBDQ domains and WPAI-UC components.
Conclusion: In induction and maintenance studies, robust relationships between IBDQ (total and domain scores) and productivity loss were observed. These post hoc clinical trial data may not be fully generalizable to clinical practice.

Table 1. Percentage of productivity loss at IBDQ total scores in patients with UC in OCTAVE Phase 3 induction and maintenance studies (main model with IBDQ total score as a continuous anchor)

	Productivity loss, least squares mean, % (95% CI)
IBDQ total score	
32	100.7 (97.3, 104.1)
40	96.8 (93.6, 99.9)
60	86.9 (84.2, 89.5)
80	76.9 (74.7, 79.2)
100	67.0 (65.3, 68.8)
120	57.1 (55.7, 58.5)
140	47.2 (46.1, 48.4)
160	37.3 (36.2, 38.4)
180	27.4 (26.1, 28.8)
200	17.5 (15.8, 19.2)
220	7.6 (5.5, 9.7)
224	5.6 (3.4, 7.8)
Point decrease in IBDQ total score	
1	0.5 (0.5, 05)
16	7.9 (7.5, 8.4)

The WPAI-UC is a self-administered six-item survey that generates four metrics: absenteeism (work time missed), presenteeism (impairment whilst working), productivity loss (overall work impairment from the combination of absenteeism and presenteeism), and activity impairment (non-work activity impairment). WPAI component scores are expressed as percentages, with a higher percentage indicating greater impairment and less productivity
The IBDQ evaluates disease-related quality of life by 32 items over four domains: bowel (total domain score ranges from 10 to 70), emotional (total domain score ranges from 12 to 84), social (total domain score ranges from 5 to 35), and systemic (total domain score ranges from 5 to 35). For the total score (ranges from 32 to 224) and each domain, a higher score indicates a better quality of life
CI, confidence interval; IBDQ, Inflammatory Bowel Disease Questionnaire; UC, ulcerative colitis; WPAI-UC, Work Productivity and Activity Impairment-Ulcerative Colitis

S1041

Treatment Patterns of an Adalimumab Biosimilar (ABP 501) Among Patients With Inflammatory Bowel Disease: An Observational Study Using German Pharmacy Claims Database

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Introduction: ABP 501 (AMGEVITA®) is the first adalimumab biosimilar approved by the FDA and the EMA for treating certain immune-mediated inflammatory diseases, including inflammatory bowel disease (IBD). Real-world evidence from European countries on utilization patterns of ABP 501 can provide valuable data ahead of US market entry.
Methods: This retrospective cohort analysis using the IQVIA German pharmacy claims database included patients (≥18 years) with documented evidence of IBD diagnosis (Crohn's disease or ulcerative colitis) who received ABP 501 between October 2018 and March 2020 and had ≥365 days of continuous observation both pre- and post-initiation of ABP 501. Descriptive statistics were used to report treatment history at baseline (12 months prior to ABP 501 initiation) and concomitant medication use while receiving ABP 501. Persistence was evaluated using Kaplan-Meier analysis with a permissible treatment gap of up to 120 days.
Results: For the 3,362 patients included in the analysis, mean age was 41 years, 49% were women, most were treated primarily in an office-based clinical setting (85%) and by gastroenterologists (73%) (Table). In total, 54% (n=1,828) had no prior exposure to adalimumab (ADA) reference product (RP) or other ADA biosimilars (ADA-naïve patients) and 46% (n=1,534) were previously treated with ADA RP or biosimilars (Switchers) during baseline. Prior use of glucocorticoids (54% vs. 27%), immunosuppressive drugs (25% vs. 15%), and other biologics (including non-ADA TNF inhibitors [TNFi]; 15% vs. 4%) at baseline was more common for ADA-naïve patients than Switchers. Median persistence of ABP 501 was 12.1 (95% CI: 11.3 – 13.0) months, with numerically higher persistence being observed in Switchers (14.1 months, 95% CI: 12.7 – 15.3) than ADA-naïve patients (10.9 months, 95% CI: 9.8 – 11.6). Approximately one-fifth of all patients switched from ABP 501 to other advanced therapies within 12 months of ABP 501 initiation, most frequently to other non-TNFi biological therapies (9.3% of all patients) followed by switching to the RP (6.6% of all patients).
Conclusion: Our findings suggested an overall low switch rate to RP among patients receiving ABP 501 for treating IBD. Higher treatment persistence was observed in Switchers than ADA-naïve patients. However, differences in prior medication use at baseline need to be taken into consideration when interpreting data across groups.

Table 1.

	All patients	Adalimumab-naïve patients[a]	Switchers[b]
Patient count	3,362	1,828	1,534[c]
Age in years, mean (SD)	40.9 (14.4)	40.1 (14.2)	41.9 (14.7)
Sex, n (%)			
Female	1,637 (48.7%)	887 (48.5%)	750 (48.9%)
Male	1,280 (38.1%)	716 (39.2%)	564 (36.8%)
Unknown	445 (13.2%)	225 (12.3%)	220 (14.3%)
Treating specialty, n (%)			
Dermatologists	2 (0.1%)	1 (0.1%)	1 (0.1%)
Gastroenterologist	2,468 (73.4%)	1,346 (73.6%)	1,122 (73.1%)
Rheumatologist	98 (2.9%)	46 (2.5%)	52 (3.4%)
Unknown	794 (23.6%)	435 (23.8%)	359 (23.4%)
Treatment setting, n (%)			

Table 1. (*continued*)

	All patients	Adalimumab-naïve patients[a]	Switchers[b]
Hospital-based	506 (15.1%)	284 (15.5%)	222 (14.5%)
Office-based	2,856 (85.0%)	1,544 (84.5%)	1,312 (85.5%)
Prior treatment at baseline[d], n (%)			
Non-steroidal anti-inflammatory drugs (NSAIDs)	566 (16.8%)	323 (17.7%)	243 (15.8%)
Glucocorticoids	1,410 (41.9%)	994 (54.4%)	416 (27.1%)
Immunosuppressive drugs	678 (20.2%)	453 (24.8%)	225 (14.7%)
Tumor necrosis factor inhibitor (TNFi; excluding adalimumab)	225 (6.7%)	184 (10.1%)	41 (2.7%)
Other biologics (excluding TNFi)	104 (3.1%)	88 (4.8%)	16 (1%)
Janus kinase inhibitor (JAKi)	12 (0.4%)	12 (0.7%)	0 (0.0%)
Concomitant treatment, n (%)			
NSAIDs	443 (13.2%)	216 (11.8%)	227 (14.8%)
Glucocorticoids	812 (24.2%)	522 (28.6%)	290 (18.9%)
Immunosuppressive drugs	327 (9.7%)	187 (10.2%)	140 (9.1%)

[a]Adalimumab-naïve patients were those with no previous use of adalimumab reference product or other adalimumab biosimilars within 12 months prior to ABP 501 initiation.
[b]Switchers were patients who were previously treated with adalimumab reference product or other adalimumab biosimilars within 12 months prior to ABP 501 initiation. Adalimumab-naïve patients and Switchers are mutually exclusive categories.
[c]n=1,297 were switched to ABP 501 from adalimumab reference product and n=237 were switched from other adalimumab biosimilars.
[d]Categories are not mutually exclusive. Patients were possibly treated with more than 1 categories of drugs during baseline.

S1042

Comparison of Colectomy Rates in Biologic Naive Ulcerative Colitis Patients on Ustekinumab and Vedolizumab

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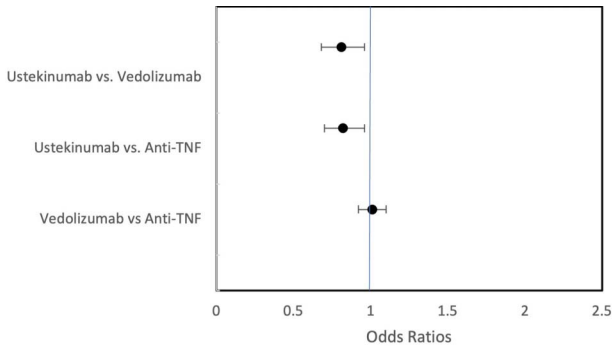
Introduction: Between 10% to 20% of patients with Ulcerative Colitis (UC) require surgical treatment of their disease between 5 and 10 years of diagnosis. Anti-tumor necrosis factor (anti-TNF) therapy has been associated with lower surgical rates in IBD. However, the rate of surgical intervention in ustekinumab- and vedolizumab-treated biologic naïve UC patients is unknown. We aimed to investigate the effect of ustekinumab and vedolizumab on colectomy rates in bio-naïve UC patients.
Methods: A commercial database (Explorys Inc, Cleveland, OH) was utilized, which included electronic health record data from 26 major integrated US healthcare systems. We identified bio-naïve UC patients. The primary outcome was to examine the association between anti-tumor necrosis factor (anti-TNF) medications, ustekinumab, and vedolizumab therapy and the colectomy rate in bio-naïve UC patients after at least 12 weeks of treatment. Secondary endpoints were factors associated with increased risk of surgical intervention in these bio-naïve UC patients. (Figure)
Results: The database included over 70 million individuals in which we identified 208,880 (0.30%) adult (>18 years) patients with UC. Among all UC patients, 0.7% received ustekinumab, 2.3% received vedolizumab, and 9.4% received anti-TNF as first-line biologic therapy. The rate of colectomy was lower among ustekinumab-treated compared to vedolizumab-treated (11.8% vs. 14.1%, p = 0.01) and anti-TNF-treated (111.8% vs. 14.0%, p = 0.01) bio-naïve UC patients. However, colectomy rates did not significantly differ between vedolizumab-and anti-TNF-treated bio-naïve UC patients (14.0% vs. 14.0%, p = 0.77). Females were more commonly associated with colectomy in ustekinumab-treated than vedolizumab- and anti-TNF-treated bio-naïve UC patients. Age < 65 years was more commonly associated with colectomy in ustekinumab- and vedolizumab-treated than anti-TNF-treated UC patients. Neoplasm of the colon was more commonly associated with colectomy in vedolizumab-treated than anti-TNF-treated UC patients. However, the rate of malignant neoplasm was not significantly different. (Table)
Conclusion: In this large cohort of biologic naïve UC patients, the colectomy rate was lower in ustekinumab-treated compared to vedolizumab- and anti-TNF treated patients after at least 12 weeks of therapy. Further prospective studies are needed to compare the effectiveness and safety of first-line ustekinumab and vedolizumab therapy in UC.



[1042] **Figure 1.** Comparison of Colectomy rates in biologic naive UC patients requiring colectomy after at least 12 weeks of ustekinumab, vedolizumab, and anti-TNF.

Table 1. **Characteristics of biologic naive UC patients requiring colectomy after at least 12 weeks of ustekinumab and vedolizumab**

Factors	Ustekinumab	Vedolizumab	Odds ratio (95% confidence interval), P value
Age			
Adults (18-65y)	160 (84%)	560 (80%)	1.33 (0.86-2.05), 0.19
Seniors (>65y)	30 (16%)	140 (21%)	0.75 (0.48-1.15), 0.19
Race			
White	170 (89%)	630 (90%)	0.94 (0.55-1.59), 0.83

Table 1. (*continued*)

Factors	Ustekinumab	Vedolizumab	Odds ratio (95% confidence interval), P value
Non-white	20 (11%)	70 (11%)	1.05 (0.62-1.78), 0.83
Gender			
Female	110 (58%)	330 (47%)	1.54 (1.11-2.13), 0.008
Male	80 (42%)	370 (53%)	0.64 (0.46-0.89), 0.008
Clinical characteristics			
Tobacco user (current and former)	178 (94%)	660 (94%)	0.65 (0.36-1.1), 0.17
Clostridium difficile infection	40 (21%)	140 (20%)	1.06 (0.71-1.58), 0.74
Neoplasm of colon	60 (32%)	240 (34%)	0.88 (0.62-1.24), 0.48

S1043

Tofacitinib for the Treatment of Pouch-Related Disorders: A Case Series

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Introduction: The effectiveness of tofacitinib for pouch-related disorders after total proctocolectomy (TPC) with ileal pouch anal anastomosis (IPAA) is poorly understood. We conducted a retrospective case series of patients receiving tofacitinib for the treatment of pouch-related disorders.
Methods: This was a retrospective case series of adults prescribed tofacitinib for chronic pouchitis (CP), cuffitis, or Crohn's-like disease of the pouch (CLDP) at a large academic medical center after 1/1/2015. Patients treated primarily for non-IBD indications were excluded. Electronic health records were manually reviewed for demographics, inflammatory bowel disease (IBD) medication history, pouchoscopy reports, laboratory data, and clinical assessments. The primary outcome was clinical response determined by provider assessment at first clinical follow-up after tofacitinib initiation. Additional outcomes included endoscopic response (determined by endoscopist assessment), tofacitinib discontinuation, need for oral antibiotics or corticosteroids, change in bowel frequency, resolution of rectal bleeding and urgency, IBD hospitalization, need for bowel surgery or ileostomy, and adverse events (AEs).
Results: There were 6 patients who initiated tofacitinib for CP (n=3), cuffitis (n=2), or CLDP (n=1) after IPAA. 5 patients underwent TPC for inflammation and 1 was for dysplasia. All but 1 patient had prior biologic exposures. 3 patients were using antibiotics and 2 were using oral corticosteroids at the time of tofacitinib initiation. Other baseline characteristics are presented in **Table.** Clinical follow-up occurred at a median of 109 days (IQR 49-171 days) after tofacitinib initiation. 1/6 (CP) patients had clinical response. 2/3 patients with post-tofacitinib endoscopic assessments (1/2 CP and 1/1 cuffitis) had endoscopic response at a median of 191 days (IQR 113.5-229 days). All patients ultimately discontinued tofacitinib after a median of 133 days (IQR 95-254 days). Reasons for discontinuation were lack of efficacy (n=3: 1 CP, 2 cuffitis), AEs (n=2: 1 CP, 1 CLDP), and self-discontinuation out of safety concerns (n=1: CP). AEs occurred in 4/6 patients and included infections (*C. difficile*, pneumonia, candida esophagitis, cytomegalovirus cuffitis, perianal abscess) and dizziness and headaches. Other outcomes are presented in **Table.**
Conclusion: The results of this case series do not support the use of tofacitinib for pouch-related disorders. Larger studies are needed to confirm these findings.

Table 1. **Baseline characteristics and outcomes**

Baseline Characteristics	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Pouch phenotype	Chronic pouchitis[a]	Chronic pouchitis	Chronic pouchitis	Cuffitis	Cuffitis	Crohn's-like disease of pouch
Age at tofacitinib initiation, y	57	75	61	29	39	50
Sex	Female	Male	Female	Male	Male	Female
Race	Unavailable	White	White	White	Other	White
Ethnicity	Hispanic	Non-Hispanic	Unknown	Non-Hispanic	Non-Hispanic	Unknown
Age at IBD diagnosis, y	45	33	39	25	21	20
Age at colectomy, y	46	60	49	28	24	32
Reason for colectomy	Inflammation	Inflammation	Dysplasia	Inflammation	Inflammation	Inflammation
Initial tofacitinib dose, mg	10	10	20	20	20	20
Dose change, mg	n/a	n/a	n/a	n/a	n/a	10
Current smoking	No	No	No	No	Yes	No
Number of prior biologics	3	1	0	4	2	5
Number of prior anti-TNFs	2	0	0	3	1	1
Prior vedolizumab	No	Yes	No	Yes	Yes	Yes
Current antibiotics	No	Yes	Yes	No	No	Yes
Current oral prednisone or budesonide	Yes	No	No	No	No	Yes
Current immunomodulator	No	No	No	No	No	No
BMI, kg/m^2	23.4	22.7	17.6	27.9	29.3	24.6
BMs per 24 hours	5	12	4	12	6	12
Nocturnal BMs	No	Yes	No	Yes	Yes	Yes
Rectal bleeding	No	No	No	Yes	No	No
Urgency	No	Yes	No	Yes	No	No
Fistula	No	No	No	No	No	No

Table 1. (*continued*)

Baseline Characteristics	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
CRP, mg/L[b]	13.5	n/a	2.2	4.0	3.5	3.1
Fecal calprotectin, ug/g[b]	n/a	134.9	482.1	n/a	54.9	262.0
Albumin, g/dL[b]	3.9	3.3	4.5	4.6	4.4	3.6
Pre-tofacitinib pouchoscopy impression	Ulcers in pouch	Mild erythema, congestion, and ulcers in pouch	Mild erythema and friability in J pouch	Mayo 3 cuffitis	Mayo 3 cuffitis	Erythema in j-pouch, superficial ulcers along anastomosis and blind limb, neo-TI strictures, dilated to 12 mm
Outcomes	**Patient 1**	**Patient 2**	**Patient 3**	**Patient 4**	**Patient 5**	**Patient 6**
Clinical response at follow-up[c]	Yes	No	No	No	No	No
Post-tofacitinib pouchoscopy impression[d]	Ulcers in pouch	Normal pouch	n/a	Mayo 3 cuffitis	n/a	n/a
Endoscopic response	No	Yes	n/a	No	n/a	n/a
Days to discontinuation	2103	294	83	134	131	38
Reason for discontinuation	Patient self-discontinued out of safety concerns	Adverse events	Ineffective	Ineffective	Ineffective	Adverse events
Oral antibiotics or steroids at follow-up	No	No	Yes	Yes	No	Yes
Δ BMs per 24 hours (post-pre) at follow-up	-2	-4	+4	-4	0	0
Resolution of nocturnal BMs	n/a	Yes	n/a	No	No	No
Resolution of rectal bleeding	n/a	n/a	n/a	Yes	n/a	n/a
Resolution of urgency	n/a	No	n/a	No	n/a	n/a
Δ CRP (post-pre), mg/L[e]	-6.0	n/a	+0.2	-0.9	-1.1	n/a
Δ Fecal calprotectin (post-pre), ug/g[f]	n/a	n/a	n/a	n/a	-10.9	n/a
IBD hospitalization during follow-up[g]	Yes	Yes	No	No	No	No
Surgery during follow-up	No	No	No	No	No	No
Adverse event during follow-up	n/a	*C. difficile*, pneumonia, and candida esophagitis	n/a	Cytomegalovirus cuffitis	Intersphincteric abscess	Dizziness, headaches, fatigue

a. This patient had dual indications for tofacitinib: pouchitis and rheumatoid arthritis. b. The most recent laboratory values available within 6 months prior to tofacitinib initiation were included. c. Clinical follow-up occurred median of 109 days (IQR 49-171 days) after tofacitinib initiation d. Pouchoscopy occurred median of 191 days (IQR 113.5-229 days) after tofacitinib initiation. e. CRP measurements occurred median of 86 days (IQR 41-124 days) after tofacitinib initiation f. Fecal calprotectin measurement occurred 121 days after tofacitinib initiation. g. Hospitalization occurred at 303 and 8 days after tofacitinib initiation for patients 1 and 2, respectively. Abbreviations: TNF = tumor necrosis factor, BMI = body mass index, BM = bowel movement, CRP = C-reactive protein

S1044

Prevalence of Vitiligo Among IBD and Celiac Disease Patients: Results From a Population-Based Study

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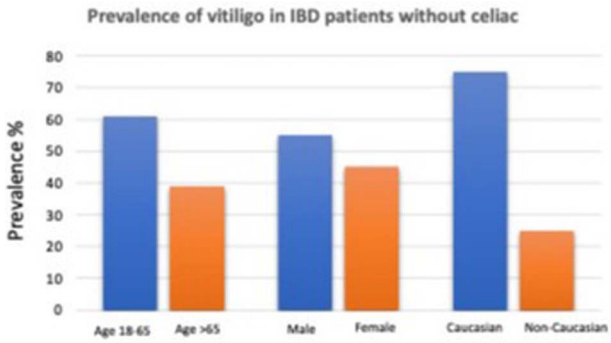
Introduction: Inflammatory bowel disease (IBD) is associated with skin manifestation;
Erythema :odosum and pyoderma gangrenosum being the most common but other skin disorder have been reported in IBD. Vitiligo is a rare autoimmune disease that is diagnosed based on clinical findings and examining the skin by wood lamp that reveals depigmentation patches. In the past, case studies (Shafa S et al) and case reports have suggested a link between Vitiligo and IBD. Using a large database, we aim to describe the epidemiology and risk of Vitiligo in IBD patients.
Methods: We used a multi-instituitional database (Explorys Inc, Cleveland, OH), an aggregate of electronic health record data from 26 US healthcare systems. In this database, we identified patients with a Systemized Nomenclature of Medicine Clinical Terms diagnosis of IBD, CD, and vitiligo from 1999 to the present. We assessed the association of vitiligo in IBD patients without CD and CD patients without IBD and compared them with individuals with neither IBD nor CD.
Results: Out of the 70,383,890 patients in the database, we identified a total of 50,020 patients with vitiligo (0.1%), 412,950 patients with IBD (0.6%), and 136,690 patients with CD (0.2%). Among those with vitiligo, there were 450 (0.4%) CD patients (without IBD), 880 (0.3%) IBD patients (without CD), 50 (0.2%) patients with both celiac and IBD, and 48,640 (0.07%) patients with neither CD nor IBD (control group). The prevalence of vitiligo was 0.4% in celiac disease (without IBD) and 0.3% in IBD (without CD). The risk of vitiligo was higher in the CD-only group [OR 5.65 (5.15–6.20)] and IBD-only group [OR 3.24 (3.03–3.46)] compared to the control group (Table). In the IBD-only group, vitiligo was more commonly associated with females compared to males [OR 1.44 (1.19–1.74), P< 0.0001], in adults aged 18–65 compared to elderly patients [2.52 (2.08–3.06), P< 0.0001], and in Caucasians compared to non-Caucasians (OR 9.0 [7.25–11.17], P< 0.0001) (Figure).
Conclusion: Utilizing a large population database, we report a distinct increased association of vitiligo in IBD and CD. Further studies are necessary to confirm this association and discover the mechanism behind this association.



[1044] **Figure 1.** Gender-, Age- and Race-Based Prevalence ratio of vitiligo in individuals with IBD without history of celiac disease in the United States.

Table 1. Odd's ratio comparing the prevalence of vitiligo in celiac disease and in IBD to patients with vitiligo without celiac or IBD

	OR, 95% CI, p-value *Compared to patients with vitiligo without celiac nor IBD
Vitiligo in Celiac disease (Excluding those with IBD)	OR 5.65 (5.15-6.20), P< 0.0001
Vitiligo in IBD (Excluding those with celiac)	OR 3.24 (3.03-3.46), P< 0.0001

Univariate analysis used to calculate OR
OR; odds ratio, CI; confidence interval, IBD; Inflammatory bowel disease.

S1045

Racial Disparities in Utilization of Medications in Inflammatory Bowel Disease Patients

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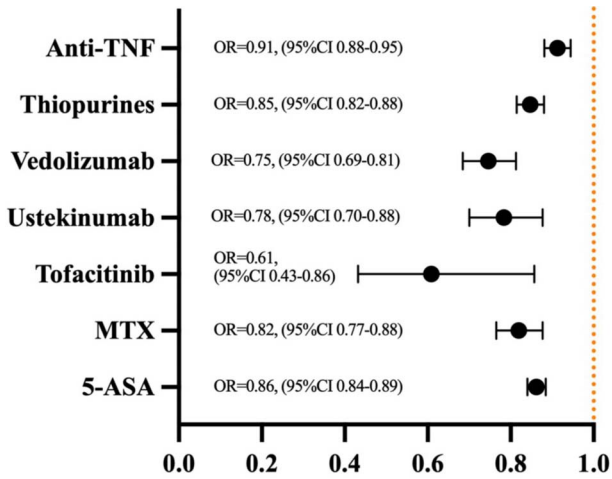
[1]Cleveland Clinic, Cleveland, OH; [2]Royal Jordanian Medical Services, Amman, Al Karak, Jordan; [3]Cleveland Clinic Foundation, Cleveland, OH.

Introduction: Inflammatory bowel disease (IBD) is traditionally associated with European ancestry but is increasingly seen among the different races and ethnicities in the United States. Large, multicenter studies across the US and Canada report more complex disease phenotypes among African American individuals. In our study, we explored the disparities in the treatment of IBD among the major racial groups in the United States.
Methods: We used a multi-institutional database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) with a diagnosis of IBD (either Crohn's disease (CD) or Ulcerative colitis (UC) between 1999 to present. Based on race, the study population was divided into two groups African American and Caucasian. The two groups were further categorized based on the type of medical therapy for IBD, such as thiopurines, methotrexate, 5-ASA, anti- tumor necrosis factor (anti-TNF), ustekinumab, and vedolizumab.
Results: Of the 70,383,890 individuals in the database, we identified 249,420 (0.35%) patients with CD and 208,990 (0.30%) patients with UC. Among all IBD patients, 32,870 were African American (8 %) and 314,660 (76.2 %) were Caucasian. When compared with Caucasians, African American IBD patients were less likely to be treated with immunomodulator therapy such as 5-ASA [OR 0.86, $p < 0.0001$], methotrexate [OR 0.82, $p < 0.0001$] and thiopurines [OR 0.85, $p < 0.0001$] and immunosuppressant therapy with biologics such as anti-TNF [0.91, $p < 0.0001$], Ustekinumab [OR 0.78, $p < 0.0001$], Vedolizumab [OR 0.74, $p < 0.0001$] and Tofacitinib [OR 0.61, $p = 0.0044$].
Conclusion: Our large cohort of IBD patients demonstrates significant healthcare disparity in the United States population. African American patients with IBD were significantly less likely to be treated with either immunomodulator or biologic therapy when compared to Caucasians. It is important for gastroenterologists to identify barriers to care in the African American IBD population and implement measures that can improve access to healthcare.



[1045] **Figure 1.** Forest plot of immunomodulators and biologic Therapy in race based-IBD patients. Univariate analysis used to calculated OR. The odds ratio in African Americans are based on whites as reference group. OR; odds ratio. CI; confidence interval. AA; African-American, TNFs; anti tumor necrosis factors, Thiopurines; azathioprine and mercaptopurine, MTX; Methotrexate.

Table 1. Univariate Logistic Regression of immunomodulators and biologic Therapy in race based-IBD patients

	AA IBD n=31,010 (%)	Caucasian IBD n=259,320 (%)	OR	CI	P-value
Anti-TNFs	1,560 (5%)	18,460 (7.1%)	0.69	0.65-0.72	< 0.0001
Thiopurine	1,420 (4.5%)	17,090 (6.5%)	0.68	0.64-0.71	< 0.0001
Vedolizumab	300 (0.9%)	4,400 (1.6%)	0.56	0.50-0.63	< 0.0001
Ustekinumab	120 (0.3%)	1,640 (0.6%)	0.61	0.50-0.73	< 0.0001
Tofacitinib	30 (0.1%)	490 (0.2%)	0.51	0.35-0.74	= 0.0004
Methotrexate	620 (1.9%)	6,690 (2.5%)	0.777	0.70-0.83	< 0.0001
5-ASA	8,520 (26%)	90,830 (29%)	0.86	0.84-0.88	< 0.0001

OR; odds ratio. CI; confidence interval. AA; African-American, anti-TNFs; anti tumor necrosis factors, IBD; inflammatory bowel disease. 5-ASA; Mesalamine.

S1046

Association of Serum IgG4 and Disease Outcomes in Patients with Inflammatory Bowel Disease

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Introduction: The etiology of Inflammatory bowel disease (IBD) is multifactorial and is thought to be influenced by inappropriate activation of the gut mucosal immune system. Immunoglobulin G (IgG) humoral immune response specifically subclasses 1, 2, & 3 activate the classical complement pathway to clear infection. IgG subclass 4 (IgG4) cannot activate the classical complement cascade. The role of IgG4 in IBD pathophysiology as an immunomodulator is controversial. This study aims to characterize the association of low, normal, and high IgG4 levels on the outcomes of patients with IBD.
Methods: This was a retrospective chart review of a multisite tertiary care center database evaluating all patients with IBD who had an IgG4 level drawn between 2014 and 2021. Subjects were divided into low, normal, and high IgG4 level groups. Demographic and clinical data stratifying IBD activity and severity was collected by manual chart review. The SPSS program was used for data analysis. Categorical variables were summarized using the number and percent, and continuous variables were summarized by mean and standard deviation. Associations were done using the chi-square or Fishers exact test for categorical variables, and ANOVA or Mann Whitney for continuous variables. P-value of 0.05 was set to indicate statistical significance.
Results: 284 patients with IBD had an IgG4 level checked. Of these patients, 22 had a low IgG4 level (7.7%), 16 had a high IgG4 level (5.6%) and 246 (86.6%) had a normal IgG4 level. There was no difference in IBD subtype (Crohn's disease vs. ulcerative colitis), mean age, age at diagnosis with IBD, or smoking between the 3 groups or either group compared to the other separately. There was no difference in number of hospitalizations, C-reactive protein levels, need for intestinal resection, or in presence of primary sclerosing cholangitis, pancreatitis, or perianal disease between the groups. Regarding medication use, significantly more patients in the low IgG4 group had previous exposure to vedolizumab compared to the other groups and more patients in the low IgG4 group received vedolizumab, azathioprine, and prednisone during the 5-year follow up after IgG4 level was checked.
Conclusion: A low serum IgG4 level is associated with increased rates of vedolizumab, azathioprine, and steroid use. Study limitations include potential bias in ordering IgG4 levels which in our practice is reserved for patients not responding to therapy.

S1047

Decreased Hospitalization Costs and Charges in Cannabis Users With IBD

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Introduction: The use of cannabis for symptom control in patients with inflammatory bowel disease (IBD) is common. Cannabis contains over 500 substances, several of which have exhibited anti-inflammatory properties in murine models. However, human clinical studies show conflicting data regarding its effects on IBD activity. The aim of this study was to examine and compare the clinical outcomes of cannabis users vs. cannabis non-users in admitted patients with IBD using a national database.
Methods: Retrospective, observational study using the National Inpatient Sample (NIS) 2018. All patients with principal ICD10CM codes for IBD were included. The cohort was stratified into ulcerative colitis (UC) and Crohn's disease (CD). Primary outcome was determining occurrence and odds of admission for IBD in patients with cannabis consumption compared to patients with no cannabis consumption. Secondary outcomes included inpatient morbidity, mortality, colectomy odds, hospital length of stay (LOS), and total hospital costs and charges. Multivariate regression analyses were used to adjust for confounding variables.
Results: A total of 99,530 patient admissions for IBD were included in the study (39% UC), of who 3,095 (3.11%) had associated use of cannabis. Mean age was 36 years and 35% were female. A greater proportion of African Americans were noted to be cannabis users compared to non-cannabis users (26.44% vs 13.30%, respectively). Cannabis-users with CD were noted to have higher odds of admission (aOR: 1.17, p< 0.01), while cannabis users with UC had lower odds of admission for IBD (aOR:0.80, p< 0.01) compared to non-cannabis users. Cannabis users with CD displayed lower odds of acute kidney injury (AKI) and multiorgan failure compared to non-cannabis users. Overall, cannabis users had decreased associated hospitalization costs and charges compared to non-cannabis users (Table).
Conclusion: Cannabis users with UC displayed lower odds of admission compared to non-cannabis users. Although cannabis users with CD had higher odds of admission for IBD, these patients demonstrated lower odds of AKI and multiorgan failure. This may potentially suggest a lower degree of disease activity compared to non-cannabis users. This was also potentially reflected in the overall lesser hospitalization costs and charges. Future studies are needed to better assess inpatient outcomes of cannabis users with IBD, particularly focusing on disease activity.

Table 1. Adjusted Odds Ratios and Means for Cannabis Users with IBD Compared to Patients with Non-cannabis Users with IBD

	Adjusted Odds Ratio	95% Confidence Interval	p-value
IBD Admission	1.03	0.97 - 1.14	0.48
Crohn's Disease	1.17	1.05 - 1.30	< 0.01
Ulcerative Colitis	0.80	0.68 - 0.94	< 0.01
Mortality	n/a	n/a	n/a
Crohn's Disease			
Ulcerative Colitis			
Shock	0.97	0.35-2.70	0.95
Crohn's Disease	0.77	0.18-3.33	0.73
Ulcerative Colitis	1.30	0.31-5.49	0.72
AKI	0.81	0.56-1.18	0.28
Crohn's Disease	0.52	0.31-0.87	0.01
Ulcerative Colitis	1.52	0.88-2.61	0.13
SIRS	1.34	0.77-2.32	0.30
Crohn's Disease	1.45	0.72-2.95	0.29
Ulcerative Colitis	1.32	0.53-3.26	0.55

Table 1. (*continued*)

	Adjusted Odds Ratio	95% Confidence Interval	p-value
Multiorgan Failure	0.76	0.53-1.11	0.16
Crohn's Disease	0.48	0.29-0.82	< 0.01
Ulcerative Colitis	1.42	0.83-2.45	0.20
Colectomy	0.67	0.45-1.00	0.06
Crohn's Disease	0.75	0.46-1.23	0.27
Ulcerative Colitis	0.56	0.27-1.17	0.13
	No Cannabis Use	Cannabis Use	p-value
Mean Costs (USD$)	$12,152	$11,033	< 0.01
Crohn's Disease	$11,723	$11,052	< 0.01
Ulcerative Colitis	$12,817	$10,984	0.01
Mean Charges (USD$)	$49,610	$46,105	< 0.01
Crohn's Disease	$47,612	$46,549	0.10
Ulcerative Colitis	$52,710	$44,953	< 0.01
Mean LOS (days)	5.04	4.94	0.35
Crohn's Disease	4.89	4.87	0.55
Ulcerative Colitis	5.26	5.12	0.68

IBD - Inflammatory Bowel Disease, AKI - Acute Kidney Injury, SIRS - Systemic Inflammatory Response Syndrome, LOS - Length of Stay.

S1048

Cervical Cancer Screening for Patients With Inflammatory Bowel Disease: A Tertiary Care Center Experience

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Introduction: Evidence has suggested an increased risk of cervical high-grade dysplasia and cancer in females with Inflammatory Bowel Disease (IBD) on immunosuppressive medications. Therefore, gastroenterology societies have recommended annual cervical cancer screening for this IBD specific population. This is ultimately performed to improve earlier detection of cervical cancer in high-risk patients.
Methods: A sample of patients were selected from a medical records database at a tertiary care. Inclusion criteria included a confirmed diagnosis of Ulcerative Colitis (UC) or Crohn's Disease (CD) and an established primary care clinic relationship with the internal medicine residents or non-teaching internists of the same medical center. General Demographics, referrals to Obstetrics/Gynecology, department from where the referrals were placed, performance of the Papanicolaou tests, results of the tests, and the dates of the tests were tabulated and studied. Information relating to the clinical aspects of IBD including current and previous medical therapies was also collected.
Results: A total of 30 patients with a diagnosis of IBD receiving biologic therapy were included in the study. 23 patients were cared for in the resident clinic and 7 were followed by non-teaching internists. 9 out of 30 patients had not completed a Papanicolaou test and all of whom were diagnosed with IBD beyond three years of the time of data collection. Of the 21 patients who completed the first Papanicolaou test, 19 had normal results, the remaining 2 had atypical squamous cells of undetermined significance. No further procedures, such as colposcopy or LEEP, were performed in these 2 patients. No statistically significant difference was found in patients receiving their first Papanicolaou test between CD and UC patients. 10 out of the 19 patients with initial normal results completed their second Papanicolaou test, however there was a median of 581.5 days between the two screenings. Only 8 patients completed a third Papanicolaou test. Of the 30 patients, only 6 were referred to Obstetrics/Gynecology, with all these referrals being made by internal medicine physicians.
Conclusion: Although the sample size was small, this study does demonstrate a gap in current application of cervical cancer screening guidelines in this high risk IBD population. Ultimately, a follow up study to evaluate the provider and patient knowledge as well as adherence to screening guidelines would be needed to highlight reasons for this gap in care.

S1049

Comparing Recurrence Rates of *Clostridioides difficile* Infection in Patients With Inflammatory Bowel After Low, Medium, and High Doses of Oral Vancomycin for the Initial Episode of CDI

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Introduction: Inflammatory bowel disease (IBD) patients are at higher risk of *Clostridioides difficile*infection (CDI) and subsequent complications including recurrent CDI (rCDI). While newer treatment guidelines recommend fidaxomicin as first line therapy for CDI, oral vancomycin (OV) is still routinely used first line. There are no guidelines as to what dose of OV should be used in IBD patients with a first episode of CDI. In this study, we sought to compare rCDI rates in IBD patients treated with different doses of OV for the first episode and also to evaluate risk factors for rCDI in these patients.
Methods: We retrospectively reviewed 1100 patient records from an existing IBD database to identify patients with a history of a first episode of CDI and subsequent rCDI between 11/1/2018 - 6/01/2021. The following data were obtained: baseline demographics, details of IBD history including medication use, treatment of first CDI including dose of OV (low = 125mg,medium=250mg, and high=500 mg), and rCDI. Categorical variables were analyzed using the Chi-Square test.
Results: A total of 42 IBD patients (3.8% of the total cohort, 52% female, 76% white race, median age was 46 yrs [range 24-84]) with a diagnosis of CDI were identified, and 8 of these patients had rCDI. 23 patients (54.8%) had CD and 19 patients (45.2%) had UC, and the majority of patients were on biologics (27/42, 64%). Twenty-eight patients were on low dose OV, 8 medium dose, and 6 high dose. There was no difference in risk of rCDI in patients treated with either medium dose OV (p=0.16) or high dose OV (p=0.88) when compared to low dose OV. Also, use of biologics (p=0.91), gender (p=0.17), race (p=0.93), and UC diagnosis (p=0.28) did not increase risk of rCDI (Table).
Conclusion: Neither medium dose nor high dose OV compared to low dose OV for the first episode of CDI decreased the risk of rCDI. Use of biologics and IBD subtype did not increase risk of rCDI. This may have been due to a small sample size and a low number of rCDI cases in our cohort. Future prospective study in a larger cohort of patients is necessary to confirm this finding. Also, despite the recent guideline change recommending fidaxomicin as first line therapy for CDI, OV continues to be a reasonable alternative as first line therapy for CDI; we also aim to compare the efficacy of fidaxomicin and OV in IBD patients treated for CDI in a larger cohort of patients.

Table 1. **Predictor of recurrent CDI**

Predictors	Unadjusted OR	95% Confidence Interval		P-value
Female	**3.38**	**0.59**	**19.16**	**0.17**
White	0.92	0.15	5.51	0.93
Ulcerative Colitis	2.38	0.49	11.63	0.28
Biological therapy	0.91	0.18	4.48	0.91
Vancomycin dosage				
low	1.00			
medium	3.60	0.61	21.35	0.16
high	1.20	0.11	13.15	0.88

S1050

Clinical Outcomes in Crohn's Disease Patients With Acute Appendicitis Treated Operatively vs Non-Operatively

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Introduction: The effects of surgical versus medical management of appendicitis in Crohn's disease (CD) patients remain unknown. Our aim was to evaluate outcomes of CD patients who have undergone operative versus non-operative treatment of acute appendicitis.
Methods: We performed a retrospective cohort study of adult CD patients presenting to the University of Minnesota with acute appendicitis between 1/1/2015 and 12/31/2020. Electronic health records were reviewed for demographics, CD classification, medications, disease activity, appendicitis course and subsequent complications and disease outcomes. A t-test was used to compare continuous variables and Fisher's exact tests were used to compare categorical variables. Univariate logistic regression was used to compare outcomes for those treated with operative versus non-operative management of appendicitis.
Results: We identified 24 patients with CD who underwent treatment for appendicitis. Eight patients (33%) received nonoperative management with antibiotics. Sixteen patients (66%) had surgical management. Of those managed with surgery, 4 (25%) were treated with concomitant antibiotics. Crohn's disease activity, measured using the physician global assessment (PGA), was similar in both groups. Five patients (63%) in the medically managed group had a CD flare on admission compared to one (6%) in the surgically managed group (63% vs 6%, p< 0.01). Four patients (50%) treated with antibiotics eventually required an appendectomy. No differences in length of stay, rate of complications up to 6 months, time to subsequent CD-related surgery or time to CD flare were seen between the two groups.
Conclusion: In CD, antibiotic therapy alone can be an effective and safe option for the treatment of acute appendicitis, especially in patients presenting with a concomitant flare. Non-operative management can also help avoid eventual surgery in half of patients. Further data are needed to better characterize individual risk factors and outcomes in this patient population and shared decision making should guide current management.

Table 1. **Clinical characteristics of Crohn's Disease patients presenting with acute appendicitis**

	All	Antibiotics (n=8)	Surgery (n=16)	P-value
Sex				>0.05
F	10	4 (50%)	6 (37%)	
M	14	4 (50%)	10 (63%)	
Physician global assessment score				>0.05
Remission	8	1 (13%)	7 (44%)	
Mild	2	0	2 (12%)	
Moderate	6	3 (37%)	3 (19%)	
Severe	8	4 (50%)	4 (25%)	
Presence of flare during admission				< 0.01
Yes	18	5 (63%)	1 (6%)	
No	6	3 (37%)	15 (94%)	
Age at appendicitis episode		31 (18-44)	40 (31-49)	>0.05
Length of stay		2.5 (1.9-3.1)	2.3 (0.9-3.8)	>0.05

S1051

Differences in Healthcare Resource Utilization and Costs by Race/Ethnicity in Patients With Inflammatory Bowel Disease: Results From the National Health and Wellness Survey

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Introduction: Across many chronic diseases, racial and ethnic disparities are evident in healthcare resource utilization (HCRU). Inflammatory bowel disease (IBD) is associated with significant morbidity, particularly with sub optimal care, and rates of inpatient care may act as a surrogate for disease severity. The objective of this study was to characterize the relationship of race/ethnicity and with HCRU and costs in patients with IBD.
Methods: Adults with a self-reported physician diagnosis of Crohn's disease (CD) or ulcerative colitis (UC) who participated in the United States National Health and Wellness Survey (2018-2020) were included. Bivariate (interim) analyses were conducted to compare HCRU and costs across racial/ethnic groups.
Results: Analyses included 2,577 participants (CD: 818 White, 109 Black, and 150 Hispanic; UC: 1,150 White, 99 Black, and 251 Hispanic). Hispanic participants reported more mean emergency room (ER) visits (CD: 1.92 [SD 5.63]; UC: 1.93 [4.20]) and hospitalizations (CD: 1.98 [4.44]; UC: 1.76 [5.63]) over six months than White participants (CD: 0.96 [2.18] and 0.75 [1.99], P=0.001 and P< 0.001, respectively; UC: 0.66 [2.56] and 0.60 [3.22], both P< 0.001). Hispanic participants with CD also had more mean hospitalizations than Black participants (1.98 [4.44] vs. 1.02 [2.00], P< 0.006), and Black participants with UC had more ER visits than White participants (1.44 [2.39] vs. 0.66 [2.56], P=0.03). Higher annualized direct medical costs were found for Hispanic (CD: $92,636 [$169,447]; UC: $94,919 [$214,961]) than for White participants with CD and UC (CD: $53,681 [$90,905]; UC: $45,721 [$147,649], both P< 0.001) and Black participants with CD ($56,803 [$80,328], P=0.02). Total annual costs due to work productivity impairment were higher for Hispanic participants than for White participants with CD ($20,852 [$19,775] vs. $15,961 [$17,847], P = 0.03), but were not significantly different for any other comparisons. (Table)
Conclusion: Black and Hispanic participants with IBD had higher HCRU and direct medical costs than White participants. Notably, Hispanic participants with CD also had higher HCRU and direct medical costs than Black participants, highlighting the need to consider different racial/ethnic groups separately when assessing health outcomes and burden of disease. Further research is needed to better characterize the relationship between race/ethnicity and HCRU, including consideration of disease severity as a factor.

Table 1. **HCRU and medical costs in White, Black, and Hispanic participants with IBD**

	CD (N = 1,077)			UC (N = 1,500)		
	White (n = 818)	Black (n = 109)	Hispanic (n = 150)	White (n = 1,150)	Black (n = 199)	Hispanic (n = 251)
Gender, n (%)						
Male	397 (48.5%)	54 (49.5%)	95 (63.3%)†	454 (39.5%)	52 (52.5%)*	113 (45.0)
Female	421 (51.5%)	55 (50.5%)	55 (36.7%)†	696 (60.5%)	47 (47.5%)*	138 (55.0%)
Age in years, mean (SD)	48.34 (16.48)	36.84 (14.39)*	34.05 (11.05)†	52.48 (16.28)	38.48 (16.08)	38.45 (14.27)†
HCRU (past 6 months), mean (SD)						
Total number of HCP visits[a]	7.24 (9.87)	6.02 (6.93)	7.33 (8.61)	6.11 (6.70)	7.32 (8.98)	10.55 (31.50)†
Total number of GE visits	0.76 (1.18)	0.87 (1.65)	0.43 (1.05)†,‡	0.54 (1.00)	0.41 (0.83)	1.10 (4.68)†,‡
Total number of ER visits	0.96 (2.18)	1.45 (3.27)	1.92 (5.63)†	0.66 (2.56)	1.44 (2.39)*	1.93 (4.20)†
Total number of hospitalizations	0.75 (1.99)	1.02 (2.00)	1.98 (4.44)†,‡	0.60 (3.22)	1.40 (2.32)	1.76 (5.63)†

Table 1. (*continued*)

	CD (N = 1,077)			UC (N = 1,500)		
	White (n = 818)	Black (n = 109)	Hispanic (n = 150)	White (n = 1,150)	Black (n = 199)	Hispanic (n = 251)
Costs (USD), mean (SD)						
Total annualized direct medical costs	$53,681 ($90,905)	$56,803 ($80,328)	$92,636 ($169,448)†,‡	$45,721 ($147,649)	$74,117 ($90,924)	$94,919 ($214,961)†
	$15,961 ($17,847)	$14,963 ($16,977)	$20,852 ($19,775)†	$14,344 ($18,673)	$12,652 ($16,339)	$17,240 ($16,399)
Total annual costs due to work productivity impairment[b]						

a Includes visits to any of the following: general practitioner/family practitioner; internist; allergist; cardiologist; dentist; dermatologist; diabetologist; endocrinologist; gastroenterologist; geriatrician; gynecologist; hepatologist; infectious disease specialist/infectologist (diseases such as HIV or hepatitis); neurologist; nephrologist; nurse practitioner/physician assistant; obstetrician; oncologist; ophthalmologist; orthopedist; otolaryngologist (ears, nose, and throat specialist); plastic surgeon; podiatrist; psychiatrist; psychologist/therapist; pulmonologist (lung specialist); respiratory therapist; rheumatologist; urologist; other medical specialist. b Total annual costs due to work productivity impairment were only calculated among respondents who were participating in the labor force at the time of the survey and who had a valid response (i.e., non-missing) for the number of hours working in the past 7 days and the number of hours missed in the past 7 days. * $P < 0.05$ between Black/African American and White participants. † $P < 0.05$ between Hispanic and White participants. ‡ $P < 0.05$ between Hispanic and Black/African American participants. Note: P values were calculated using Bonferroni-adjusted pairwise comparisons. Abbreviations: BMI = body mass index; CD = Crohn's Disease; ER = emergency room; GE = gastroenterologist; HCP = healthcare provider; HCRU = healthcare resource utilization; IBD = inflammatory bowel disease; UC = ulcerative colitis, USD = United States dollar.

S1052

Characterization of Crohn's Patients That Are Multiple Primary Non-Responders to Biologic Therapies

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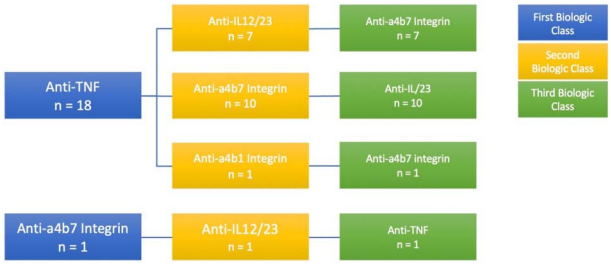
Introduction: Despite the advance in therapeutic options for the treatment of Crohn's disease (CD), there remains a significant portion of patients with ongoing disease activity. Few studies have characterized medically refractory CD. Identifying patients that are true primary non responders to multiple therapies may reveal novel mechanisms on which future therapies can be built. Here we describe the clinical characteristics of CD patients that are primary non-responders to all 3 FDA approved classes of biologics from a tertiary center.
Methods: Two datasets were used to optimize criteria for primary medical non-responders: a randomly selected cross sectional dataset of 783 patients and a dataset of 42 patients screened for a clinical trial that permitted failure of 3 biologics. Internal review of the datasets and iterative optimization of primary non-response criteria settled on the following factors to define primary medication non-response (1) demonstrated endoscopic disease activity, (2) trial of therapy > 6 months, and (3) no record of adverse event.
Results: Of 806 patients reviewed, 19 met criteria for primary non response across 3 biologic classes. Mean age at diagnosis was 24.7 and 53% were male. Disease distribution: 13 (68%) patients with ileocolitis, 4 (21%) patients with colitis, & 2 (11%) patients with ileitis/jejunitis. 2 (11%) patients had upper tract involvement. Regarding phenotype, 5 (31.2%) patients had inflammatory (B1), 5 (31.2%) had fibrostenotic (B2), & 9 (56.3%) patients had penetrating (B3) disease. 3 (15.7%) patients had perianal disease. 12 (63%) patients had prior CD surgery. The refractory patients had more upper tract disease and B3 disease compared to controls. 18 patients received an anti-TNF agent as the 1st biologic class & 1 received an anti-a4b7 integrin. 2nd class: 10 received anti-a4b7 integrin, 8 received an anti-IL12/23, & 1 received anti-a4b1 integrin. 3rd class: anti-a4b7 integrin in 10, anti-IL12/23 in 8 and anti-TNF in 1. Strategies employed after biologic failure were trial referral (16), recycling class (10), med optimization (5), surgery (2), off label meds (2) & combo biologics (1).
Conclusion: This retrospective review demonstrates there is a subset of highly medically refractory CD patients that are primary non-responders to multiple biologics. Common clinical characteristics don't allow the identification of these patients, suggesting the need for molecular phenotyping in order to identify rational rescue therapies for this unique subset of patients.



[1052] **Figure 1.** Sequence of class selection in group of multiple biologic refractory patients

Table 1. **Comparison of clinical characteristics between refractory group (primary non-response to 3+ classes of biologics) vs non-refractory patients. (Crohn's Disease = CD)**

	Multiple Biologic Refractory Patients (n = 19)	Non-Refractory Patients (n = 787)	P value
Mean age at Dx (yrs)	24.7	26.17534943	0.999
Male	10 (52.6%)	427 (54.2%)	0.883
Female	9 (47.4%)	360 (45.7%)	0.883
Ileocolitis Distribution	13 (68.4%)	413 (52.4%)	0.278
Colitis Distribution	4 (21.1%)	173 (22.0%)	0.278
Ileal Distribution	2 (10.5%)	201 (25.5%)	0.278
Upper GI CD	2 (10.5%)	9 (1.14%)	**0.0005**
B1 (Non-stricturing, Non-penetrating)	5 (26.3%)	455 (57.8%)	—
B2 (Stricturing)	5 (26.3%)	225 (28.6%)	—
B3 (Penetrating)	9 (47.4%)	106 (13.5%)	**0.00002**
Perianal Disease	3 (15.8%)	69 (8.77%)	0.289
Prior CD Surgery	11 (58.0%)	340 (43.2%)	0.201

S1053

Characteristics, Medication and Healthcare Utilization of Crohn's Disease Patients Stratified by Short-CDAI Status: Descriptive Results From the IBD PLEXUS and IQVIA Linked Dataset

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Introduction: Crohn's disease (CD) is a life-long chronic inflammatory disorder. CD studies in real-world settings usually do not include disease severity measures since few longitudinal databases with robust clinical data and long-term administrative claims exist. We describe the demographics, clinical characteristics, medications and healthcare utilization of patients with CD stratified by the short Crohn's Disease Activity Index (sCDAI) with a unique CCF and IQVIA linked dataset.
Methods: This retrospective analysis used data from the Crohn's & Colitis Foundation (CCF) SPARC IBD and IBD QORUS data linked with IQVIA's prescription and medical claims (LRx/Dx), to identify a cohort of CD patients with up to 24 months pre-enrollment and at least 18 months of follow-up. Enrollment date into CCF studies was used as the Index date and CD patients were stratified into three disease activity cohorts based on enrollment sCDAI scores: Remitters (R) sCDAI < 150, Non-remitters and non-moderate-severe (nRnMS, a.k.a. 'Mild') sCDAI = 150-219, and Moderate-Severe (MS) sCDAI ≥220. Medication use for biologics, immunomodulators and 5-ASAs was based on a hierarchy of highest step achieved. Descriptive analyses were performed for baseline period clinical characteristics, medications and healthcare utilization.
Results: Of the 1756 CD patients included, 1027 were in R, 361 were nRnMS and 368 were in MS disease activity. Mean age for the three groups was around 43 years. Time since CD diagnosis was more than 10yrs in 54.5%, 52.9% and 58.4% of the R, nRnMS and MS groups, respectively. Mean (±SD) sCDAI scores at enrollment were 96.2 (±28.1) for R, 182.0 (±20.3) for nRnMS and 302.0 (±77.7) for the MS group. Biologics were used in 37.5% of R, 39.3% of nRnMS and 33.4% of MS patients. High use of corticosteroids and opioids was seen across all three groups. Emergency room visits increased across the R (7.1%), nRnMS (12.2%) and MS (27.2%) cohorts. Hospitalizations were highest in the MS group. (Table)
Conclusion: We utilized a unique longitudinal dataset linked to administrative claims, to provide an initial description of characteristics between three severity-based CD cohorts. We observed generally more severe disease features, medication and healthcare utilization in CD patients who were not in remission. Future research will evaluate relationships between disease characteristics, treatment patterns and poor outcomes during follow-up.

Table 1. Demographics, Disease Characteristics, Medications and Healthcare Utilization*

Characteristic	Remitters (n = 1027)	nRnMS (n = 361)	Mod/Sev (n = 368)
Female (n, %)	545 (53.1%)	230 (63.7%)	250 (67.9%)
Age in years (mean +/- SD)	42.9 (15.2)	43.2 (15.2)	43.1 (13.9)
Age at First Diagnosis (n, %)			
< =11	60 (5.8%)	25 (6.9%)	25 (6.8%)
12-17	161 (15.7%)	50 (13.9%)	50 (13.6%)
18-39	557 (54.2%)	206 (57.1%)	210 (57.1%)
>=40	202 (19.7%)	66 (18.3%)	63 (17.1%)
unknown/missing/other	47 (4.6%)	14 (3.9%)	20 (5.4%)
Time since diagnosis (Mean Yrs +/- SD)	14.2 (10.8)	14.7 (11.4)	15.6 (12.2)
Race (n, %)			
African American (Black or African American)	79 (7.7%)	43 (11.9%)	29 (7.9%)
Asian	69 (6.7%)	24 (6.6%)	22 (6.0%)
Other	103 (10.0%)	37 (10.2%)	42 (11.4%)
White	776 (75.6%)	257 (71.2%)	275 (74.7%)
CD Phenotype (n, %)			
Both stricturing and penetrating	105 (10.2%)	36 (10.0%)	42 (11.4%)
Non-stricturing and non-penetrating	371 (36.1%)	124 (34.3%)	115 (31.3%)
Penetrating and non-stricturing	129 (12.6%)	47 (13.0%)	47 (12.8%)
vStricturing and non-penetrating	218 (21.2%)	77 (21.3%)	92 (25.0%)
vUnknown / Missing	204 (19.9%)	77 (21.3%)	72 (19.6%)
Other Current IBD Manifestations (n, %)			
Intestinal inflammation	43 (5.6%)	21 (7.4%)	36 (12.1%)
Extra-intestinal manifestations	24 (3.1%)	14 (4.9%)	23 (7.7%)
None / unknown / missing	711 (92.2%)	254 (89.8%)	255 (85.6%)
sCDAI at Enrollment (mean +/- SD)	96.2 (28.1)	182 (20.3)	302 (77.7)
Abdominal Pain (mean +/- SD)	0.3 (0.5)	1.0 (0.7)	1.7 (0.8)
Stool Frequency (mean +/- SD)	2.6 (1.4)	4.4 (2.4)	8.1 (4.6)
General Well-Being (mean +/- SD)	0.1 (0.3)	0.9 (0.5)	1.7 (0.9)
Medication Utilization (n, %)			
Current Biologic users	385 (37.5%)	142 (39.3%)	123 (33.4%)
Current IMS users (Never Biologic)	173 (16.8%)	63(17.5%)	62 (16.8%)
Current 5-ASA (Never Biologic or IMS)	57 (5.6%)	23(6.4%)	12 (3.3%)
Any Corticosteroid user	278 (27.1%)	133 (36.8%)	173 (47.0%)
Any Opioid user	202 (19.7%)	120(33.2%)	163 (44.3%)
No therapy (at least 6 months)	249 (24.2%)	71 (19.7%)	62 (16.8%)
Healthcare Utilization (n, %)			
ER Visits (in 12 months prior to enrollment)	73 (7.1%)	44 (12.2%)	100 (27.2%)
Hospitalization Visits (in 6 months prior to enrollment)	49 (4.8%)	17 (4.7%)	38 (10.3%)

Table 1. (*continued*)

Characteristic	Remitters (n = 1027)	nRnMS (n = 361)	Mod/Sev (n = 368)
Prior CD-related Surgery	18 (1.8%)	5 (1.4%)	2 (0.5%)
Office visits (in 24 months prior to enrollment)	853 (83.1%)	315 (87.3%)	330 (89.7%)

Table: Percentages may not always add up to 100% due to missing/unknown/none values for some variables

S1054

Barriers to Inflammatory Bowel Disease (IBD) Care in a Racially and Ethnically Diverse Population: Patient Survey and Chart Review Study

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Introduction: Data on IBD access to care and patient outcomes in Black/Indigenous/People of Color or Hispanic (BIOPOC/H) populations is limited. Previous studies suggest lower access to IBD specialists in Black and Hispanics may lead to worse outcomes. This study evaluated care barriers, clinical disease status and outcomes among a diverse population of White/Non-Hispanics (W/NH) and BIPOC/H patients with IBD treated at a large health system in in the US.
Methods: An anonymous online survey was created with input from a diverse panel of patients with IBD and sent once to adult patients with IBD treated in the health system between Aug 2019 - Dec 2021. The study protocol was approved by the Institutional Review Board. Arbitrary identifiers linked respondents to deidentified electronic medical record (EMR) data. Collected were demographics, symptoms, care access via the Consumer Assessment of Healthcare Providers and Systems and Barriers to Care surveys, health-related quality of life (HRQOL) via the Short Inflammatory Bowel Disease Questionnaire, the Medication Adherence Rating Scale-4, and the Beliefs about Medicines Questionnaire. EMR data examined healthcare resource utilization. Analyses compared W/NH and BIPOC/H via X^2 and t-tests.
Results: 171 out of 1,210 surveyed responded (14%); 103 (60%) W/NH, and 68 BIPOC/H (40%). Demographic information is shown in Table. BIPOC/H patients were younger and more likely to be underinsured. BIPOC/H compared to W/NH patients reported more difficulties seeing an IBD specialist (35% vs 21%; p=.04), having inadequate control of symptoms (82% vs 65%; p=.01), including more abdominal pain (58% vs 38%; p=.04) and diarrhea (70% vs 47%; p=.004). BIPOC/H patients had lower mean [SD] HRQOL scores (41 [14] vs 49 [13]; ; p< .001), reported IBD symptoms more often impacting employment (50% vs 33%; p=.029 and financial stability (53% vs 32%; p=.006). BIPOC/H patients reported more problems finding social and emotional supports to deal with IBD (64% vs 37%; p< .001). EMR data suggests BIPOC/H patients utilized Emergency Department (ED) services more often than W/NH patients in the previous 14 months (42% vs 22%; p=.004), respectively.
Conclusion: BIPOC/H patients with IBD had worse clinical disease, lower HRQOL scores, less access to specialists, less social and emotional support, and used more ED services than W/NHs. Future programs to understand and address the differences in their care and outcomes are needed.

Table 1. **Demographics**

	W/NH n = 103	BIPOC/H n = 68	p
Age, Mean (SD)	48.7 (14)	44.0 (13.3)	.03
Female gender, n (%) Male gender, n (%)	71 (69) 32 (31)	48 (71) 20 (29)	.87
Highest level of education, n (%)			
High school graduate or GED Some college or 2-year degree 4-year college graduate More than 4-year college degree	20 (20) 29 (28) 23 (22) 31 (30)	17 (25) 24 (35) 9 (13) 14 (21)	.11
Marital Status, n (%)			
Single Married/domestic partnership Widowed Separated/divorced	30 (29) 54 (52) 15 (14) 4 (3)	30 (44) 25 (37) 12 (18) 1 (2)	.12
Types of Health Insurance, n (%)			
HMO/PPO/Private Insurance Medicare Medicaid No insurance/self-pay	66 (64) 21 (20) 19 (18) 3 (2.9)	28 (41) 18 (27) 29 (43) 0 (0.0)	.001

S1055

Crohn's Disease Patients Treated With Anti-TNFs Have Lower Rates of Myocarditis

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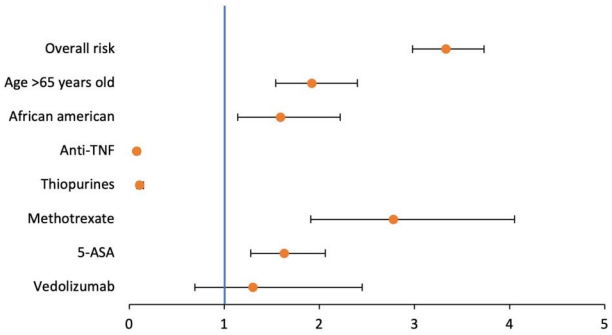
Introduction: Myocarditis is a rare extraintestinal cardiac manifestation of IBD. It is more commonly reported in Ulcerative Colitis than in Crohn's disease (CD) and consequently not frequently reported. Moreover, the prevalence of myocarditis in CD patients on immunosuppressive and immunomodulatory therapy is not well known. Our study aims to assess the prevalence of myocarditis and the effect of immune-modifying therapy in CD.
Methods: In multi-institutional database (Explorys Inc, Cleveland, OH) which includes electronic health record data from 26 major integrated US healthcare systems. Based on the Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT), we identified all patients (age >18 years) with a concomitant diagnosis of myocarditis and CD between 1999 to 2022. We investigated the prevalence of myocarditis in CD compared to patients with no IBD. Also, we compared the prevalence between CD patients with and without immune-modifying agents.
Results: Of the 70, 301,380 individuals in the database from 1999 to present, we identified 249,300 (0.3%) patients with CD, of whom 40,840 (16.4%) patients received anti-TNFs. CD patients were 59.4% females, 76% Caucasian, and 70% in 18-65 years age group. The prevalence of myocarditis was 0.12% for CD compared to 0.04% in individuals without IBD, p< 0.001. Compared to the general population, patients with CD had higher association risk of myocarditis diagnosis [OR: 3.33, p< 0.0001]. Among CD, predictors of having myocarditis included being elderly (>65 y/o), African American, smokers and has history of type 2 diabetes (P< 0.0001). The prevalence of myocarditis was significantly lower CD patients on anti-TNF agents [OR: 0.08, p < 0.0001], and thiopurines [OR: 0.11, p < 0.0001] whereas methotrexate and 5-aminosalicylates (5-ASA) had higher rates [OR: 2.78, p < 0.0001] and [OR: 1.63, p =0.0001], respectively. No significant effect was noted with Vedolizumab [OR: 1.30, P= 0.4103] (Figure).
Conclusion: In this large database, we found a higher risk association between CD and myocarditis. Anti-TNF agents and thiopurines were less likely to be associated with myocarditis, while methotrexate and 5-ASA were more likely to be associated with myocarditis in CD. The difference in the association between immune-modifying agents is unclear. Hence, further prospective studies are required to evaluate this association. Our findings may have significant implications for patients with cardiac risk factors and underlying myocardial dysfunction.



[1055] **Figure 1.** Overall Risk and Predictors of Myocarditis Among Crohn's disease. Univariate analysis used to calculate OR. OR; odds ratio, CI confidence interval. Anti-TNF; anti-tumor necrosis factor. 5-ASA; mesalamine.

S1056

Change in C-Reactive Protein 72 Hours Following Admission Associates With Inpatient and One-Year Colectomy Risk in Severe Ulcerative Colitis

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Introduction: Ulcerative colitis (UC) morbidity remains high despite multiple therapeutic advances. Early identification of risk for failure of medical therapies and need for colectomy becomes pivotal to avoid unnecessary and dangerous delays in care. Many presently-validated risk appraisal scores require subjective data to inform risk. Our study aimed to determine the predictive value of the change in C-reactive protein (CRP) during hospitalization for severe UC.
Methods: We designed a retrospective study including patients ≥ 18 years old with an admission for UC at a single academic center between 1/1/2013 and 4/1/2018. Cases were identified using the ICD-9 code 556.X and ICD-10 code K51.X and separately, manually verified. Clinical variables of interest and laboratory values were obtained via chart review or extracted from the electronic medical record. Data was analyzed using Wilcoxon rank-sum test for continuous variables, and Fischer's exact test for categorical variables. Statistical analysis was conducted using JMP ® 13.1.0.
Results: 122 hospitalized patients met the inclusion criteria with a median age of 30.2 (IQR: 22.8-46.9) years. 72 (59%) patients were male and 89 (73.6%) were Caucasian. 27 (22.3%) patients required inpatient colectomy and 49 (41.5%) had a colectomy within one year of index admission. Percent change in CRP between admission and 72 hours was predictive of inpatient colectomy (P=0.051), whereas the value of CRP on admission or at 72 hours was not (**Table**). Among patients with an increase in CRP at 72 hours, 9/21 (42.9%) required inpatient colectomy as compared to 18/101 (17.8%) without an increase in CRP (P=0.019). The percent change in CRP at 72 hours was also predictive of 1-year colectomy risk (-53.3 (50.7) vs -33.7 (49.6), P=0.003).
Conclusion: Percent change in CRP between admission and 72-hours predicts both inpatient and 1-year colectomy risk in patients hospitalized with UC. Percent change better prognosticates the need for surgery compared to CRP on admission alone. Herein, we show that a reduction in CRP by 50% 72 hours from admission is an objective and easily determined measurement to risk stratify patients early in the admission for UC.

Table 1. Predictors of colectomy during inpatient admission

Risk Factors:	Colectomy	No Colectomy	P-value
Age (years), mean (SD)	37.98 (18.51)	35.08 (14.3)	0.644
Male Sex, n (%)	14 (51.85)	58 (61.05)	0.506
White Race, n (%)	21 (77.78)	68 (72.34)	0.631
Presentation with Severe Colitis, n (%)	27 (100)	82 (86.32)	0.07
Prior Admission requiring IV Steroids, n (%)	17 (62.96)	34 (35.79)	0.015
Hospitalization in prior 4 weeks, n (%)	23 (39.0%)	50 (24.5%)	0.047*
Biologic naïve, n (%) Single prior biologic class Multiple prior biologic classes	7 (25.93) 12 (44.44) 8 (29.63)	50 (52.63) 33 (34.74) 12 (12.63)	0.024
Steroids usage prior to Presentation, n (%)	17 (62.96)	53 (55.79)	0.66
Inpatient salvage therapy	13 (48.15)	61 (64.21)	< 0.001
Laboratory Data: Mean (SD)			
Admission CRP	45.7 (35.1)	52.89 (56.31)	0.7
72 hour CRP	37.41 (45.03)	26.52 (34.43)	0.178
72 hour change in CRP %	-26.5 (58.74)	-47.19 (55.81)	0.051

S1057

A Randomized Phase I Study Comparing Pharmacokinetics, Safety and Immunogenicity of High Concentration Formulation (100 mg/mL) With GP2017 Formulation (50 mg/mL), an Adalimumab Biosimilar, in Healthy Male Subjects

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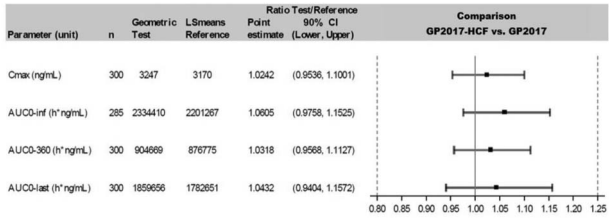
Introduction: GP2017 (adalimumab-adaz) is an approved biosimilar of adalimumab (ADL)[1], with a concentration of 50 mg/mL. A high-concentration formulation (HCF) (100 mg/mL) can reduce the injection volume, and consequently decrease the number of injections required for patients who need to administer a higher dose. A phase I study (randomized, double-blind, parallel, 2-arm study with healthy male subjects) was conducted to demonstrate pharmacokinetics (PK) comparability between a newly developed GP2017 citrate-free -HCF and the currently approved GP2017.
Methods: Healthy male subjects were randomized to receive a single 40 mg s.c. injection of either GP2017 or GP2017-HCF. PK, safety, and immunogenicity were assessed over 72 days post-injection. Primary endpoints were maximum serum concentration (C_{max}), area under the concentration–time curve from time zero to infinity (AUC_{0-inf}) and area under the concentration–time curve from time zero to 360 hours (AUC_{0-360}); area under the concentration–time curve from time zero to the last quantifiable concentration (AUC_{0-last}) was assessed as a secondary endpoint. PK comparability was concluded when the 90% confidence intervals (CIs) of the ratios of geometric means were within the predefined comparability margin of 0.80 to 1.25.
Results: 331 subjects were randomized, of which 330 received study treatment (162 GP2017-HCF; 168 GP2017). The 90% CI of the ratios (GP2017-HCF / GP2017) of geometric means for the PK endpoints (C_{max}, AUC_{inf}, AUC_{0-360} and AUC_{0-last}) were all contained within the pre-defined comparability limits of 0.80 to 1.25 (Figure). Safety was similar across groups (Table). The numbers and proportions of subjects

with positive anti-drug antibodies (ADA) and with neutralizing antibodies (NAb) were comparable overall (up to day 72: GP2017-HCF 69.1% / 63%; GP2017 64.9% / 61.3%, respectively) and at all individual visits.

Conclusion: PK comparability between GP2017-HCF and GP2017 was demonstrated, supporting the development of the new formulation of GP2017. Safety and immunogenicity profiles were comparable between treatment groups and consistent with previously reported adalimumab data.



CI=confidence interval; LS=least squares; n=number of subjects with evaluable PK parameter data.

[1057] **Figure 1.** Forest plot to compare primary and secondary PK endpoints between the treatment groups

Table 1. TEAEs by primary system organ class (at least 2% of subjects in any treatment group)

Primary system organ classPreferred term	GP2017-HCFN=162n (%)	GP2017N=168n (%)
Number of subjects with at least 1 event	80 (49.4)	95 (56.5)
General disorders and administration site conditions	55 (34.0)	69 (41.1)
Investigations	16 (9.9)	24 (14.3)
Musculoskeletal and connective tissue disorders	8 (4.9)	14 (8.3)
Nervous system disorders	8 (4.9)	6 (3.6)
Skin and subcutaneous tissue disorders	10 (6.2)	4 (2.4)
Gastrointestinal disorders	8 (4.9)	3 (1.8)
Respiratory, thoracic and mediastinal disorders	2 (1.2)	6 (3.6)
Eye disorders	1 (0.6)	4 (2.4)
Injury, poisoning and procedural complications	4 (2.5)	1 (0.6)

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S1058

A Scintigraphic Study to Evaluate the Safety, Tolerability, and Functions of a Drug Delivery System (DDS) Device in Healthy Subjects in Fasted State

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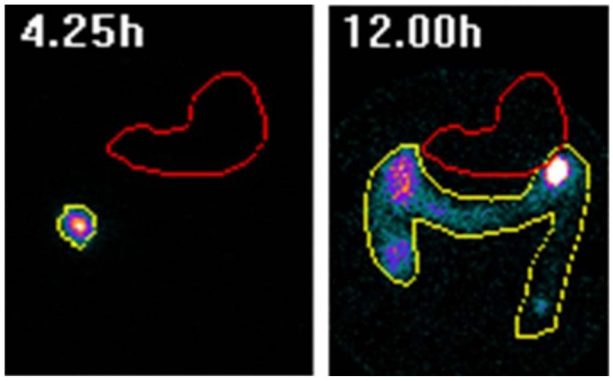
Introduction: The clinical remission in moderate to severe ulcerative colitis (UC) and Crohn's disease has plateaued at ~15-20% even with the approval of multiple biologics/drugs. The ATLAS study demonstrated that the lack of adequate amount of drug at the diseased site is responsible for limited clinical benefit. The Drug Delivery System (DDS) is an ingestible electronic targeted delivery device containing a localization system to identify colon entry (S4 calls) based on the gastrointestinal (GI) anatomy and deliver a bolus dose of a therapeutic compound to the colon mucosa to improve efficacy and reduce systemic toxicity. This was an open-label and single-center study to evaluate the safety and tolerability, and functions of a DDS device using gamma scintigraphy in normal healthy volunteers (NHV) in the fasted state.
Methods: Each subject was fasted overnight for a minimum of 8 hrs. and dosed with a single DDS device before resuming a normal diet at 4 hrs. post-dosing. Each capsule was filled with radioactive marker 111In-DTPA to identify DDS localization and to visualize payload release; water radiolabeled with 99mTc-DTPA was co-administered with the DDS to delineate GI landmarks by gamma scintigraphy. The GI transit of DDS and delivery location were confirmed by serial scintigraphy imaging and compared with the localization data in the recovered capsule.
Results: Twelve male subjects were enrolled and treated in the study. There were no reported device-related adverse events in any subject who completed the study. GI transit metrics of DDS were consistent with GI residence times observed amongst NHV. There was no early release of the radio payload prior to S4 calls being made by all 12 devices. Ten of twelve devices (83%) showed correct localization calls in the colon, confirmed by scintigraphy image analysis. In addition, among devices that showed release of the 111In-DTPA payload, the dispersion of the radioactive marker completely covered the colon over time and spread to match the 99mTc-DTPA water coverage area from the site of DDS release throughout the remainder of the colon (Figure).
Conclusion: This study demonstrated that DDS was well-tolerated and had a favorable safety profile, and the device functioned as intended in identifying and releasing drug payload in the colon. DDS provides more precise dosing with a liquid formulation at a pre-determined location in the GIT and delivers therapeutics to the site of disease to improve efficacy.



[1058] **Figure 1.** Cumulative distribution of radiotracer 111In-DTPA release from Drug Delivery System (DDS) post-dose A. the first release of 111In-DTPA was observed post-dose in the cecum/ascending colon. B. Distribution of released 111In-DTPA over time in the colon.

S1059

Burden and Impact of Cannabis Use Disorder on Outcomes of IBD Patients With Alcohol Abuse: A National Inpatient Sample Analysis 2019

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Introduction: Alcohol use disorder can potentially trigger Inflammatory bowel disease (IBD) flare-ups. With increasing use of cannabis for symptomatic relief in IBD, the impact of its chronic/habitual use on IBD outcomes remains unclear. Therefore, in this study we aimed to assess the burden and impact of concomitant cannabis use disorder (CUD) on IBD patients with known alcohol abuse.
Methods: The National Inpatient Sample (2019) with relevant ICD-10 codes were used to identify Alcoholic Inflammatory Bowel Disease (IBD) patients and Cannabis Use Disorder (CUD). We compared demographics, comorbidities, and outcomes of alcoholic IBD patients with vs. without CUD. Primary endpoints were hospital outcomes [MACCE:all-cause mortality, acute myocardial infarction (MI), cardiac arrest and stroke], intestinal obstruction, colorectal cancer, colectomy, acute kidney injury[AKI], and sepsis) compared between CUD and non-CUD cohort among alcoholic IBD patients. Multivariable regression analyses were performed adjusting for demographics, hospital-level characteristics and relevant comorbidities.
Results: Of 11,140 hospitalizations with IBD and alcohol abuse, 1130 (10%) concomitantly had CUD. Majority of the CUD cohort was white, male and the median age at admission was 40 years (IQR 33- 51). Most of them were Medicaid enrollees (41.2%) and belonged to lower 2 median household income national quartiles (31.7, 31.2%) The CUD cohort had a lower rate of traditional cardiovascular risk factors and pulmonary comorbidities except higher rate of tobacco use disorder vs. non-CUD cohort. Rates of intestinal obstruction (aOR 1.80; 95%CI:O.75-4.29) (p=0.187) and colorectal cancer (aOR 1.42; 95% CI:0.37-5.54)(p=0.610) were high among the CUD cohort (Table). However, neither of them attained statistical significance.
Conclusion: Despite a higher burden of cardiovascular disease risk factors, the CUD cohort had comparable outcomes/complications in alcoholic IBD patients vs. non CUD cohort. Future prospective studies are warranted to confirm and validate these findings focusing on mode, dose and duration of recreational/medicinal use of cannabis in IBD patients with rising prevalence of polysubstance use in the US.

Table 1. Multivariate odds of in-hospital outcomes in IBD-Alcohol Abuse Patients with vs. without Cannabis Use Disorder

	Odds ratio	95% CI		P value
		Lower	Upper	
MACCE	0.95	0.41	2.21	0.909
Intestinal obstruction	1.80	0.75	4.29	0.187
GIH	0.54	0.29	1.02	0.590
Colorectal cancer	1.42	0.37	5.54	0.610
Acute Kidney Injury	0.60	0.35	1.02	0.061
Sepsis	0.43	0.10	1.82	0.250

MACCE - Major Adverse Cardiovascular and Cerebrovascular Events - all cause mortality, acute MI, cardiac arrest, stroke. Multivariate regression models were adjusted for : Age, Sex, Race, Median household income quartile, payer status, type of admission, hospital bed size, location, teaching status, hypertension, diabetes, dyslipidemia, obesity, PVD, Prior MI, Prior PCI, Prior CABG, drug abuse, smoking, Prior TIA & Stroke, Prior VTE.

S1060

Comparison of Demographics and Phenotypic Behavior of Inflammatory Bowel Disease Among Southeast Asians and Caucasians at a Tertiary Center in Houston

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Introduction: The incidence and prevalence of inflammatory bowel disease (IBD) has increased in Southeast Asians (SEA). Our objective was to determine clinical features and phenotype of IBD in SEA in the U.S. in comparison to Caucasians.
Methods: Seventy SEA (38 Crohn's disease (CD), 32 Ulcerative Colitis (UC)) patients were compared to 70 consecutive White patients (50 CD, 20 UC patients) using Chi-square and Fischer's exact test. Bonferroni's correction was applied for multiple comparisons.
Results: UC was more prevalent in SEA compared to Caucasians (45.7% vs 28.5%, p=0.03). 64% of SEA CD patients were men compared to 28% of White CD patients (p< 0.001). Majority of SEA CD patients were diagnosed between the age of 17-40 (p=0.008). B1 disease was more prevalent in SEA with CD and B2 disease was more common in Caucasians (p< 0.01). SEA with CD had a reduced need for bowel surgery (21% vs 52% in the non-SEA group, p=0.002) and hospitalizations (21% vs 62% respectively, p value< 0.01). Ileocolonic disease was the most prevalent location of CD in both groups (71% & 56% respectively for SEA & White patients). Majority (85%) of the White patients with UC were women compared to 51.6% in the SEA group, p value=0.005. Both the groups had predominantly pancolitis at 64% and 70% respectively, with no significant difference in median age of diagnosis, response to biologic therapy, need for surgery and hospitalizations.
Conclusion: Knowledge of ethnic differences in IBD behavior, location and treatment responses can impact clinical care and treatment. A study done by Bodiwala et al also showed UC being more prevalent in South Asians with IBD (58% UC in SEA), similar to our study. Our study showed a male preponderance in the SEA CD and a female preponderance for the White UC patients. The same trend was observed in Walker et al's study in North London. In our study, a higher rate of B2 stricturing disease was noted in Caucasians in contrast from Walker et al, where the Caucasian patients had more B3 penetrating CD.

(Table) We found that SEA with IBD had milder disease with lower rate of CD/UC related surgery, hospitalizations compared to the Caucasian group, which is similar to other studies done on IBD behavior of SEA in the US. There could be a role of environmental, genetic, and dietary factors that needs to be explored further to explain the differences in severity of the disease.

Table 1. Demographics and clinical features of South Asian and Caucasian patients with Crohn's disease and Ulcerative Colitis

Crohn's Disease	South-East Asians (N=38) N (%)	Caucasians (N=50) N (%)	*p*-value
Gender			< **.001**
Females	13 (34.2)	35 (70)	
Males	25 (65.7)	15 (30)	
Age at diagnosis (Montreal Classification)			
<16 years	10 (25.6)	17 (34)	0.39
17-40 years	24 (64)	18 (36)	**0.008**
>40 years	4 (10)	14 (28)	0.06
Mean duration of disease in years	13.1 years	17 years	0.57
Family history of IBD	6 (15.3)	8 (16)	0.89
History of smoking	3(7)	4 (12.5)	0.95
Disease extent			
Ileal(L1)	10 (26.3)	12 (24.3)	0.8
Colonic(L2)	3 (7.8)	7 (14)	0.5
Ileocolonic (L3)	25 (65.7)	31 (62)	0.71
Upper GI involvement (L4)	2 (5)	6(12)	0.45
Perianal disease	10 (26.3)	12 (24)	0.71
Non-stricturing, non-penetrating disease (B1)	29 (76.3)	12 (24)	< **.001**
Stricturing (B2)	3 (7.8)	21(42)	< **.001**
Penetrating (B3)	6 (15.7)	13 (26)	0.24
History of bowel surgery for IBD	11 (28.9)	26 (52)	**0.002**
History of biologic therapy	33 (84)	46 (92)	0.27
Presence of extra-intestinal manifestations	12 (28.94)	23 (46)	0.14
Prior hospitalizations	8 (21)	31 (62)	< **.001**
Ulcerative Colitis	South-East Asians (N=32)	Caucasians (N=20)	
Gender distribution			**0.005**
Females	16 (50)	17 (85)	
Males	16 (50)	3 (15)	
Median age at diagnosis	27 years	28.5 years	0.72
Family history of IBD	4 (12.9)	5 (25)	0.26
History of smoking	1 (3)	4(20)	0.07
Disease extent			
Ulcerative Proctitis (E1)	6 (19.3)	2 (10)	0.46
Left sided UC (E2)	5 (16.1)	4 (25)	0.71
Pancolitis (E3)	20 (64)	14 (70)	0.58
History of bowel resection	2 (6.4)	5 (25)	0.14
History of biologic therapy	18 (58%)	14 (70)	0.38
Presence of extra-intestinal manifestations	10 (32.2)	4 (20)	0.53
Prior hospitalizations	9 (29)	6 (30)	0.94

S1061

A Scintigraphic Study to Evaluate the Localization and Delivery Function of a Drug Delivery System (DDS) Device in Patients With Active Ulcerative Colitis (UC) in a Fasted State

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Introduction: The clinical remission in moderate to severe ulcerative colitis (UC) and Crohn's has plateaued at ~15-20% even with the approval of multiple biologics/drugs. Altas study clearly demonstrated that the lack of adequate amount of drug at the diseased site is responsible for limited clinical benefit. The Drug Delivery System (DDS) is an ingestible electronic targeted delivery device containing a localization system to identify colon entry based on the gastrointestinal (GI) anatomy and deliver a bolus dose of a therapeutic compound to the colon mucosa to improve efficacy and reduce systemic toxicity. DDS was shown to be well-tolerated and functioned as intended in identifying and releasing radiotracer in the colon of normal healthy volunteers (NHV). Here, we aim to evaluate the safety and functionality of DDS in active UC patients in a fasted state.

Methods: Patients with endoscopy and histology confirmed UC and active UC status defined as having Mayo score ≥ 2 or elevated Fecal Calprotectin Protein or high sensitivity C-reactive protein within one month of the screening visit were eligible for the study. Each patient was fasted overnight and dosed with a single DDS capsule prior to resuming a normal diet. Each capsule was filled with radioactive marker 111In-DTPA to independently identify DDS localization and to visualize payload release; water radiolabeled with 99mTc-DTPA was co-administered with the DDS to delineate GI landmarks by gamma scintigraphy. The GI transit of DDS and delivery location of the radiotracer were confirmed by serial gamma scintigraphy imaging.

Results: This is a preliminary analysis of an ongoing study of active UC patients with Mayo scores between 3-8 enrolled and dosed in the study. GI transit metrics of DDS were consistent with the variable GI motility and the frequent bowel movements observed among active UC patients. DDS device demonstrated correct localization identification of colon entry and release of radiotracer in the colon regardless of variable GI motility, the level of inflammation, or blood in the colon of UC patients compared to NHV (Table), confirmed by gamma scintigraphy image analysis. The dispersion of the radiotracer adequately covered the colon from the site of release throughout the remainder of the colon.

Conclusion: This result demonstrated that DDS functioned as intended in identifying and releasing the payload in the colon regardless of GI motility or disease status.

Table 1. GI transits, Residence Time, and Radiotracer (111In-DTPA) Delivery Location of DDS Device post-dose in Active UC patients (PM-602) and Normal Healthy Volunteers (NHV) (PM-601)

Subject	Mayo score	Gastric emptying time (min)	Small intestine Residence time (min)	Arrival Time at Cecum (min)	1st Capsule release In-111 (min)	Capsule location at the time of 1st capsule release	Capsule Recovery Time (hrs)	No. of Bowel Movements required to recover Capsule
602-116-001	6	104	169	273	324	Cecum	47.67	3
602-116-002	3	23	122	145	190	Cecum	26.50	3
602-116-003	8	38	292	330	354	Cecum	32.83	5
601-NHV (N = 11)* Median	N/A	29	228	270	368	Cecum/Asc Colon/Splenic Flexure	23.99	1 (n=6) 2 (n=4) 3 (n=1)

*Excluded one subject due to anomalous transit of the DDS device from the stomach to the duodenum and then back into the stomach.

S1062

A Prospective Study on the Effect of Dietary Interventions Registered Dietitians on Patients With Inflammatory Bowel Disease

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Introduction: The etiology of inflammatory bowel disease (IBD) is multifactorial, and diet may be implicated. While patients (pts) commonly associate diet with symptoms, it is unclear if diet plays a role in disease activity. This study sought to assess the impact of dietary modifications as directed by a registered dietician (RD) on disease activity in IBD pts.
Methods: IBD pts were referred to a gastrointestinal (GI) RD at the discretion of their provider between 11/2020 and 6/2022. At the time of the initial RD visit, pts' symptoms and quality of life scores were assessed using the irritable bowel severity scoring system (IBS-SSS) and either Harvey Bradshaw Index (HBI) or Simple Clinical Colitis Activity Index (SCCAI). RD follow-up was as needed. Six weeks after diet implementation, surveys were administered via phone call or email. Pts also assessed their dietary adherence at the 6 week and 3 month time points. Dietary adherence difficulty was assessed on a 10-point scale (10=most difficult). McNemar's test was used to analyze categorical variables and student's t-test was used for continuous variables.
Results: Fourteen pts participated in the study, 8 with Crohn's disease (CD) and 6 with ulcerative colitis (UC); 57% were women. Median age at IBD diagnosis was 27 years (range, 8-60). Half (7/14) of the pts were on biologics. Nine pts had inactive disease based on laboratory, radiographic, and endoscopic data within 6 months of participation. All pts completed their symptom surveys, while 10 pts completed 6 week and 3 month dietary adherence questions. All IBD pts (p=0.024) and those with CD (p=0.048) experienced significant improvement in their IBS-SSS scores from initial visit to week 6 (Table). CD and UC pts experienced significant improvement in disease activity scores over 6 weeks (Table). CD patients reported fewer loose stools (p=0.046). Six-week dietary adherence was 63% with pt-reported adherence difficulty of 4.25/10, while the 3 month values were 62% adherence and adherence difficulty of 5/10.
Conclusion: Dietary interventions may have a role in improving clinical symptoms in IBD pts. In clinical practice, dietary changes may serve as an adjunct to medical therapy. Patients' reported dietary adherence of >50% with low adherence difficulties extending 3 months from their initial visit, demonstrates the importance of interdisciplinary care between GI providers and dietitians. Further data is being collected in a larger cohort of patients to expand on these findings.

Table 1.

Variable	Mean Change Between Baseline and 6 Weeks (Paired Difference)	Standard Deviation (Paired Difference)	p-value
Total Sample			
IBS-SSS Score	82.57	121.21	0.024
Crohn's disease			
IBS-SSS Score	115.38	136.28	0.048
HBI Score	2.88	2.47	0.013
Ulcerative colitis			
IBS-SSS Score	38.83	90.44	0.341
SCCAI Score	4.5	4.04	0.041

S1063

Corticosteroid Use in Inflammatory Bowel Disease (IBD) Patients May Lead to Worse IBD-Related Outcomes After COVID-19 Infection

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Introduction: There is growing but limited data on the effects COVID-19 has on the disease course of IBD. COVID-19 can enter epithelial cells of the gut via ACE receptors causing cell dysfunction, inflammation, and dysbiosis. Thus, we set out to evaluate IBD outcomes during and three months after COVID-19 infection.
Methods: We performed a retrospective case series comparing IBD patients in remission versus not in remission diagnosed with COVID-19 seen in a single tertiary care center from March 2020 to March 2021. COVID-19 diagnosis was made by positive rapid antigen and/or PCR. We analyzed demographics, medications, need for hospitalization, changes to immunosuppressive therapy, and IBD severity and remission status noted by endoscopic scoring or Physician Global Assessment at the time of COVID-19 diagnosis and 3 months post infection.
Results: We identified 57 IBD patients, 30 in remission and 27 not in remission, diagnosed with COVID-19. Comparison of baseline characteristics and COVID-19 and IBD related outcomes are noted in Table. Patients not in remission were more likely to be on steroids, including prednisone and budesonide, and biologics (0% vs 40.7%, p=0.00001; 73.3% vs 96.3%, p=0.03). Patients not in remission were significantly more likely to need escalation in treatment (OR 15.08; CI 2.98-76.3, p=0.001) and had more IBD related hospitalization and surgery at 3 months compared to patients in remission (18.5% vs 0%, p=0.02). We then excluded patients who had changes in IBD medications 90 days prior to COVID-19 diagnosis and found there was still an increased risk for treatment escalation (OR 7, CI 1.27-38.58, p=0.0254). Additionally, patients not in remission on steroids had an increased risk of escalation of IBD related medications, hospitalization, and surgeries than patients not in remission who were not on steroids (OR 12, CI 1.76-81.7, p=0.0111).
Conclusion: Our study suggests COVID-19 likely has minimal impact on the clinical course of IBD patients in remission. It remains unclear what the effects are on those not in remission, especially those on corticosteroids. Corticosteroid use is associated with impaired immune response and may lead to dysbiosis by downregulation of protective mucin gene expression as shown in animal models. Thus, infection with COVID-19 in patients on steroids may contribute to an increased risk of dysbiosis and subsequent disease flare. Further study is warranted to study the effects of steroids on IBD related outcomes in patient with COVID-19 infection.

Table 1. Comparison of IBD related outcomes in patients in remission versus those with active disease at time of COVID-19 diagnosis and 3 months afterwards

	Remission (SD) N = 30	Not in remission (SD) N = 27	*P*-value
Demographics			
Age	40.2 (16.3)	35.3 (13.7)	0.25
Sex			
Male	46.7%	33.3%	0.42
Female	53.3%	66.7%	0.42
Race			
White	70%	74%	0.78
Black	20%	18.5%	1.00
Asian	10%	3.7%	0.61
Hispanic	0%	3.7%	0.47
BMI	26.2 (5.6)	24.8 (4.0)	0.36
Comorbidities			
Organ transplant	3.3%	7.4%	0.60
Cardiovascular disease	13.3%	11.1%	1.00
Diabetes	3.3%	3.7%	1.00
Chronic lung disease	0%	3.7%	0.47
HTN	10%	7.4%	1.00
Current malignancy	3.3%	0%	1.00
CKD	3.3%	7.4%	0.60
Tobacco use	3.3%	3.7%	1.00
Chronic liver disease	20%	14.8%	0.73
IBD Characteristics			
Crohn's disease	73.3%	63.0%	0.57
Ulcerative colitis	26.7%	37%	0.57
Activity Mild Moderate Severe		 14.8% 77.8% 7.4%	
IBD medication use			
None	6.7%	0%	0.49
5-ASA	23.3%	14.8%	0.51
Immunomodulator			
6MP/AZA	3.3%	11.1%	0.34
MTX	10%	7.4%	1.00
Corticosteroids	0%	40.7%	**0.00001**
Budesonide	0%	18.5%	**0.02**
Prednisone	0%	22.2%	**0.01**
Biologics	73.3%	96.3%	**0.03**
Vedolizumab	16.7%	22.2%	0.74
Anti-TNF	43.3%	51.9%	0.60
Ustekinumab	13.3%	22.2%	0.49
Tofacitinib	0%	0%	1.00
COVID-19 Outcomes			
Hospitalization	13.3%	7.4%	0.67
ICU with intubation	0%	0%	1.00
Any COVID-19 therapy	3.3%	14.8%	0.18
Death	0%	0%	1.00
IBD medications held	13.3%	29.6%	0.13
IBD Outcomes at 3 months			
Experienced IBD flare	10%	51.8%	**0.005**
Escalation of immunosuppression	10%	44.4%	**0.00319**
Initiation of new steroid therapy	6.7%	22.2%	0.19
IBD related hospitalization/surgery	0%	18.5%	**0.02**

S1064

A Longitudinal Evaluation of Patients With Inflammatory Bowel Disease in Puerto Rico

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Introduction: A high prevalence of inflammatory bowel disease (IBD), including Crohn's disease (CD) and ulcerative colitis (UC), has been reported among Hispanics; however, its characterization is scarce. We aim to describe changes in clinical outcomes following the disease course for at least 3 years in a cohort from Puerto Rico (PR).
Methods: The UPR IBD Registry has collected clinical data on patients since 1995. We used a longitudinal survey tool to assess demographic and medical information of patients with IBD with a minimum 3-year follow-up. Subjects were first interviewed between 2012-2018, and the longitudinal component throughout 2020-2022. We analyzed sociodemographic, food security, body mass index (BMI), hospitalizations and surgeries, family history, and medications. Intellectus statistics was used for data analysis. The study was approved by the MSC-IRB.
Results: 91 subjects were recruited, 50.6% (45/91) were male, and 72.5% (66/91) had a CD diagnosis. Two subjects initially diagnosed with UC were later re-diagnosed with CD [74.7% (68/91)]. The majority were single (60%), mean age was 35+15 years initially and 39+16 years for the later survey. The most-reported level of education was a bachelor's degree (41%). The mean BMI in the longitudinal survey (27+6 kg/m^2) was significantly higher than in the original questionnaire (25+6 kg/m^2) [p< 0.001]. We found no difference between household income between timepoints; these ranged between $28K to $29K annually. 76% had hospitalizations in the original survey and 29% in the longitudinal questionnaire. 43% of participants reported undergoing surgery in the initial questionnaire, and 28% of the subjects during follow-up [p< 0.001]. We observed a decreasing trend in the following medications: aminosalicylates, corticosteroids, immunomodulators, and antibiotics. We observed increased use of integrin blockers and IL 12/23 antagonists. 27.5% of participants reported therapeutic failure in the longitudinal survey.
Conclusion: We observed a significant increase in BMI and targeted therapies after a minimum of three years of follow-up with a concomitant decrease in recent hospitalizations, conventional medications, and reported surgeries. Even though an increase in IBD diagnosis has been observed in Puerto Rico, better clinical outcomes have resulted over the last few years. A longer follow-up period with a larger sample is needed to better evaluate outcomes in this special population.

Table 1. For Longitudinal Variables

Variable	Original Questionnaire n (%) n=91	Longitudinal Questionnaire n (%) n=91	p-value
IBD Diagnosis			
Crohn's Disease	66 (72.5)	68 (74.7)	< 0.001
Ulcerative Colitis	25 (27.5)	23 (25.3)	
Food Security Category			
Very-Low Food Security	-	1 (1.10)	n/a
Low Food Security	-	17 (18.7)	
Marginal Food Security	-	34 (37.4)	
High Food Security	-	37 (40.7)	
BMI by Category			
Underweight	10 (11)	7 (7.7)	< 0.001
Normal	34 (37.4)	37 (40.7)	
Overweight	17 (18.7)	23 (25.3)	
Obese	17 (18.7)	24 (26.4)	
IBD Medication			
Aminosalicylates	66 (72.5)	23 (25.3)	0.003
Corticosteroids	65 (71.4)	28 (30.8)	0.891
Immunomodulators	34 (37.4)	22 (24.2)	0.041
Antibiotics	38 (41.8)	10 (11)	0.310
Anti-TNF	54 (59.3)	51 (56)	< 0.001
Integrin blockers	5 (5.5)	16 (17.6)	0.003
Interleukin antagonists	5 (5.5)	23 (25.3)	0.013

Note. Due to rounding errors, percentages may not equal 100%.

S1065

ADS024, a Single Strain Live Biotherapeutic Product, Reduces Colonic Inflammation in DSS-Induced Colitis When Dosed Twice Daily

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Introduction: Colonic inflammation is a hallmark of ulcerative colitis (UC), a disease characterized by a dysregulated immune response to gut microbiota. ADS024, an orally administered single strain live biotherapeutic product (SS-LBP), was previously shown to reduce disease activity in mice exposed to dextran sodium sulfate (DSS). ADS024 is currently being developed for the treatment of patients with mild to moderate UC.
Methods: Colitis was induced in 90 mice by 3% DSS in drinking water from Day 0 to Day 5; 6 sham mice did not receive DSS. Mice were dosed by oral gavage with ADS024 (n=15 per group) twice daily for 7 days with either 5x10^8 CFU/dose or 5x10^4 CFU/dose, or once daily with ADS024 at 1x10^9 CFU/dose or 1x10^5 CFU/dose. Negative control mice were dosed with vehicle (PBS; n=20) and a comparator group was dosed with anti-p40 mAb (n=10) once daily (IP) on Days 6, 9, 12. All mice were monitored daily for weight loss, diarrhea, blood in stool, and activity level and individually scored using the Disease Activity Index (DAI) scheme. On Day 12, all mice were sacrificed, and colons collected. Colonic cytokines and myeloperoxidase levels were quantified by ELISA.
Results: DSS-exposed animals treated with ADS024 twice daily at high dose (5x10^8 CFU/dose) demonstrated significant attenuation of weight loss (p< 0.05) and decreased composite Disease Activity Index (DAI) (p< 0.01) compared to control (DSS only) animals. This ADS024 dosing regimen also decreased mean colon weight:length ratio, a measure of inflammation, as compared to controls (p< 0.005 respectively). The anti-p40 mAb, with a mechanism of action similar to ustekinumab, an approved treatment for UC, reduced DAI but did not significantly reduce colon weight:length ratio. Once daily dosing of ADS024 at high daily dose (1x10^9 CFU given in the morning) was ineffective, despite the same total daily dose as responding mice dosed BID. A much lower daily dose (1x10^5 CFU/day) was ineffective regardless of dosing schedule. In DSS-exposed mice treated twice daily with high dose ADS024, the inflammatory marker interleukin-6 (IL6) was significantly down in colons and both interleukin 1 beta (IL1b) and colonic myeloperoxidase (MPO), a measure of active neutrophils, trended down.
Conclusion: Oral treatment with high dose ADS024 twice daily, but not once daily, improved disease activity index and reduced measures of inflammation including colon weight:length ratio and the inflammatory cytokine IL-6.

IBD

S2700 Presidential Poster Award

Fecal Microbiota Transplantation as First-Line Treatment for Immune-Mediated Colitis

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Introduction: Fecal microbiota transplantation (FMT) has been used to treat refractory immune-mediated colitis (IMC). However, front line FMT treatment has not been studied for IMC which could potentially reduce the complications related to high dose corticosteroids and the need for ongoing immunosuppressive biologic agents.
Case Description/Methods: We present three IMC cases who received first-line FMT on a research protocol. All patients had metastatic renal cell cancer and received immune checkpoint inhibitors (ICI) which lead to IMC. Clinical symptoms severity was measured by CTCAE, and endoscopy colitis severity was graded by Mayo endoscopy score. Patient A is a woman in 50s with grade 3 diarrhea and calprotectin >1000mcg/gm. Colonoscopy revealed Mayo 3 colitis. Sustained clinical remission was achieved for 13 months since day 1 after FMT. Calprotectin returned to baseline within 2 months with dramatic mucosal healing within 2 months (Mayo 1) on repeat scope despite re-challenge with 2 doses of nivolumab afterwards. Most recent staging 2 months showed favorable cancer response. Patient B is a man in 70s with grade 3 diarrhea and grade 2 colitis, with initial colonoscopy showing Mayo 3 colitis and calprotectin 244mcg/gm. He had refractory diarrhea and colitis symptom despite FMT leading to hospitalization. Subsequently he was started on steroid and vedolizumab after which his colitis was in complete remission for 10 months with histological resolution. Last staging showed stable cancer. Patient C is a man in 70s with end stage renal disease on hemodialysis and heart failure who presented with grade 3 diarrhea and grade 2 colitis and calprotectin 718mcg/gm. He had Mayo 3 colitis on initial colonoscopy and achieved partial symptom response from FMT with less incontinence and better stool consistency within one month post-FMT. Second FMT was planned, however he developed worsening heart failure with hypotension, poor tolerance to hemodialysis, and died from multi-organ failure 1.5 months later unrelated to FMT.
Discussion: This is the first study investigating the efficacy and safety of first-line FMT in treating IMC. It has demonstrated favorable safety profile and promising signal of IMC improvement. Additional investigation in larger patient cohorts is warranted to further assess the utility of FMT as a first-line treatment for IMC and its impact on cancer outcomes.

Table 1. Multivariate Cox model for progression-free survival (one year follow up)

Parameter	Hazard ratio (95% CI)	*P*
Increasing diarrhea grade	1.3(0.7-2.0)	0.353
Increasing colitis grade	0.8(0.5-1.2)	0.301
Number of ICI infusions	0.9(0.9-1.0)	0.053
Short duration Steroid +/- Biologics vs. No immunosuppression	0.2(0.1-0.8)	0.024
Long duration Steroid +/- Biologics vs. No immunosuppression	0.4(0.2-1.0)	0.051
Short duration vs. long duration steroid+/-biologic	0.6(0.2-1.8)	0.3

S2701 Presidential Poster Award

Economic Costs and Trends in Inflammatory Bowel Disease-Related Hospitalizations and Surgery in the United States

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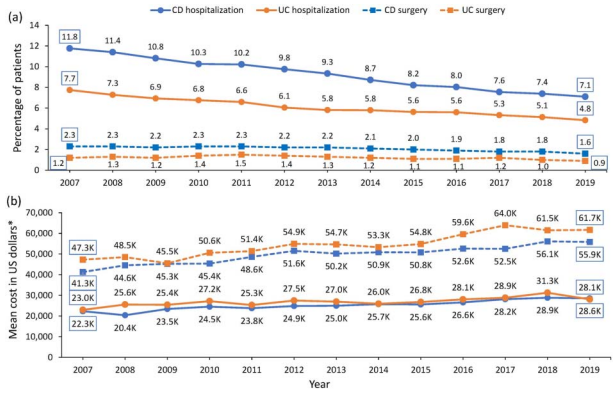
Introduction: Limited data are available on hospitalization, surgery, and cost trends over time in patients with Crohn's disease (CD) and ulcerative colitis (UC) in the United States. This analysis describes real-world trends in hospitalizations, surgery, and costs among patients with CD and UC.
Case Description/Methods: Data from patients with CD and UC in the IBM MarketScan Databases (2007–2019) were evaluated. Eligible patients for each year had to have ≥1 inpatient claim or 2 outpatient claims for either CD or UC within that year and medical benefits for the entire year. For hospitalizations, an encounter group algorithm for all inpatient claims was utilized to determine the principal diagnosis and duration of each hospital episode. The surgery encounter was defined as either a hospitalization with a CD/UC-related surgery procedure code (principal procedure type) with a CD or UC diagnosis code in the first 2 diagnosis positions of the hospital encounter or an outpatient visit. Proportions of CD and UC patients with ≥1 hospitalization or surgery, the average cost per surgery or hospitalization episode, and mean length of stay (LOS) in days were reported for each year. Costs were adjusted to 2020 US dollars. Over time, prevalence of hospitalizations decreased from 11.8% and 7.7% in 2007 to 7.1% and 4.8% in 2019 in patients with CD and UC, respectively (Figurea). The annual proportion of patients with a CD/UC-related surgery decreased from 2.3% and 1.2% in 2007 to 1.6% and 0.9% in 2019 in patients with CD and UC, respectively. Conversely, mean medical costs per CD/UC hospitalization episode increased from $22,346/$23,002 in 2007 to $28,586/$28,069 in 2019 (Figureb). Additionally, mean medical costs per CD/UC surgery increased from $41,300 and $47,286 in 2007 to $55,870 and $61,698 in 2019. In patients with CD and UC, the average LOS per hospitalization reduced from 5.8 and 6.6 days in 2007 to 4.6 and 5.6 days in 2019.
Discussion: Despite a decrease in CD- and UC-related hospitalizations and surgery from 2007 to 2019, as well as reduced mean LOS, the average cost per hospitalization and surgery increased. Additional research is warranted to better understand these trends so that medical costs can be further reduced and management of patients in the outpatient setting can be improved.



[2701] **Figure 1.** Prevalence of (a) Hospitalization and Surgery and (b) Mean Costs by Year *Includes all associated costs except medication costs. CD, Crohn's disease; K, thousand; UC, ulcerative colitis.

S2702 Presidential Poster Award

Lactobacillus Sepsis, Endocarditis, and Septic Emboli in a Patient with Ulcerative Colitis Taking Probiotics

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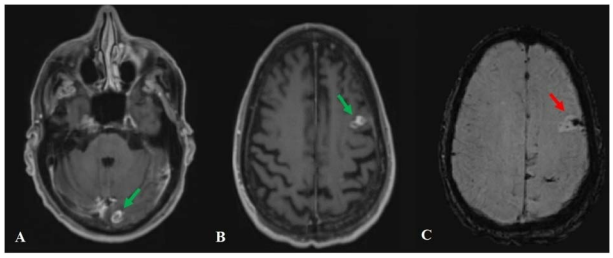
Introduction: Probiotics are live microorganisms that, when consumed in sufficient quantity, are intended to confer a health benefit. According to the NIH, probiotics are the third most used dietary supplement in the United States, with most formulations containing bacteria of the Lactobacillus genus. Despite limited clinical evidence and unclear mechanism of action, probiotics are commonly used to promote or restore the intestinal microbial balance of both healthy and ill patients. Due to significant dysbiosis in patients with inflammatory bowel disease, there has been a growing interest in the prophylactic and therapeutic potential of probiotic use.
Case Description/Methods: Our case describes a 69 year-old male presenting with 1-week of fevers, fatigue, and arthralgias shortly after a 2.5-month course of corticosteroids and intermittent levofloxacin treatments. His medical history included bioprosthetic aortic valve replacement 2-years prior and ulcerative colitis taking daily balsalazide and lactobacillus-containing probiotics. On presentation the patient met 3 of 4 SIRS criteria for shock with suspected infectious etiology. Empiric IV antibiotics and fluid resuscitation was initiated, with vasopressors added for persistent hypotension. Blood cultures revealed Lactobacillus rhamnosus bacteremia at 31 hours and antibiotics were deescalated to IV ampicillin. Four days after hospital discharge the patient experienced acute right-sided paresthesia and paresis. Upon return to the emergency room, magnetic resonance imaging of the brain demonstrated numerous ring-enhancing lesions with hemorrhagic transformation. Transesophageal echocardiogram revealed a new mobile density on the bioprosthetic aortic valve, raising the suspicion for Lactobacilli rhamnosus infective endocarditis with secondary septic emboli to the brain. The patient was subsequently treated with IV gentamycin and ampicillin, with transition to indefinite oral amoxicillin suppressive therapy.
Discussion: Considered non-pathogenic flora, studies have shown Lactobacilli to be the most common bacteria to translocate the intestine. Nevertheless, opportunistic infections in healthy individuals are rare owing to an intact intestinal barrier and rapid immune clearance of translocated bacteria. The present case highlights the increased literature-reported risk of Lactobacillus translocation in patients who are immunocompromised, use microbiome-disrupting antibiotics, or suffer from disorders associated with increased intestinal barrier permeability.



[2702] **Figure 1.** Contrast enhanced magnetic resonance imaging (MRI) of the brain. (A-B) Demonstrates supratentorial ring-enhancing lesions involving the left parietal and left occipital regions (green arrows). (C) Susceptibility weighted imaging (SWI) shows evidence of hemorrhage (red arrow) within lesions, with greatest hemorrhage involving the left middle frontal gyrus.

S2703 Presidential Poster Award

Multifocal Small Bowel Adenocarcinoma as Primary Presentation of Crohn's Disease in a Patient With a Remote History of Celiac Disease

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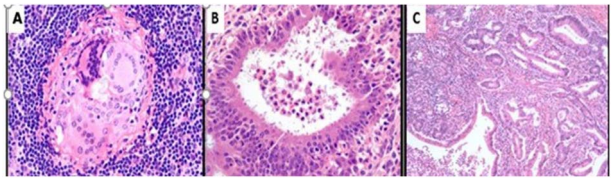
Introduction: Small bowel adenocarcinoma (SBA) accounts for less than 5% of all gastrointestinal malignancies. Crohn's disease (CD) is a well-known risk factor for developing small bowel adenocarcinoma. CD-associated small bowel adenocarcinoma tends to develop at a younger age, mainly involves distal jejunum and terminal ileum, and is male predominant. SBA in the setting of CD is incidentally found after surgical resection. We present a rare case of small bowel adenocarcinoma as the first manifestation of Crohn's disease in a patient with a history of celiac disease.
Case Description/Methods: We present a 35-year-old female with a remote history of biopsy proven celiac disease and a history of multiple small bowel strictures dating back to the age of 16, which was thought to be due to ulcerative jejunitis. She never underwent an exploratory laparoscopy for tissue diagnosis. She was placed on a gluten-free diet with improvement in her symptoms. She presented to our clinic with episodes of nausea and vomiting that started five years ago. Labs done at that time were unremarkable except for mildly elevated fecal calprotectin. CT scan abdomen pelvis showed multiple strictures throughout the small bowel, including the proximal jejunum. Colonoscopy with terminal ileal biopsy was normal. She was then seen by surgery and underwent an exploratory laparoscopy with resection of two small bowel strictures and stricturoplasty of the other two strictures. Pathology showed active jejunitis and non-necrotizing granulomas consistent with Crohn's disease and findings of well differentiated mucinous adenocarcinoma in the first stricture and moderate to poorly differentiated adenocarcinoma in the second stricture. She was staged to be T2 N0 MX. She was started on adalimumab and has been on remission. (Figure)
Discussion: Our case is unusual in that there are very few reported cases of SBA in undiagnosed CD. Data concerning SBA in CD is based on case reports, small retrospective series and literature reviews. SBA in CDs strictures poses a diagnostic challenge as it is difficult to differentiate a malignant stricture from an inflammatory stricture using conventional investigation modalities. As such, it is essential for surgeons to maintain a high index of suspicion for occult SBA and careful investigation with frozen section and/or resection for suspicious findings. Also, our case is exceptional as the diagnosis of inflammatory bowel disease could not be established at the time when the patient sought medical care.



[2703] **Figure 1.** A) Non-caseating granuloma of regional lymph node (400x), B) Cryptitis and crypt abscess (400x). C) Moderately to poorly differentiated adenocarcinoma with desmoplastic stromal response within jejunal stricture site (100x).

S2704 Presidential Poster Award

A New Protein Losing Enteropathy: Autoimmune Cryptolytic Enterocolitis

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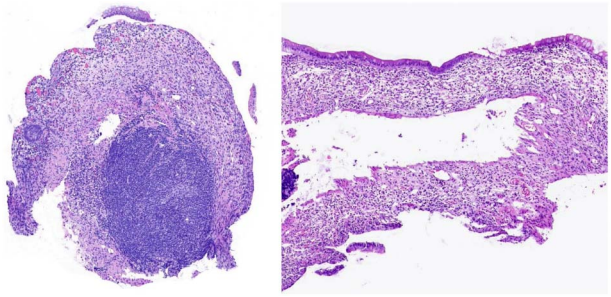
Introduction: Protein losing enteropathy (PLE) can be classified into erosive, non-erosive, and increased interstitial pressure PLE. Presenting signs are often chronic non-bloody diarrhea, anasarca, abdominal pain, and weight loss. We present a complex case of a PLE presentation with a novel diagnosis.
Case Description/Methods: A 30-year-old woman with a history of migraines presented with severe abdominal pain and chronic diarrhea. She was on long-term combined estrogen-progestin oral contraceptive pills (OCP) and chronic high dose non-steroidal anti-inflammatory (NSAID) medications. She was exposed to mycoplasma pneumoniae one month prior to presentation, without other infectious exposures.

Laboratory tests were notable for hemoglobin 6 g/dL, albumin 0.5 g/dL, stool pathogen PCR negative, and fecal calprotectin >3000μg/g. Extensive infectious work up only revealed Mycoplasma IgM+. Inflammatory markers and alpha-1 anti-trypsin clearance were elevated, and she was found to have warm autoimmune hemolytic anemia. CT angiography excluded ischemia and vasculitis (autoimmune serologies were negative), revealing diffuse enterocolitis, confirmed on magnetic resonance enterography with ileal ulcers. Endoscopic evaluation revealed diffuse superficial ulcerations terminal ileum and colon with diffuse mucosal sloughing. Histopathology revealed diffusely injured crypts with crypt drop-out and minimal inflammation, without any findings to suggest infection, inflammatory bowel disease (IBD) or autoimmune enteritis (Figure). Normal B-cell switching studies excluded common variable immunodeficiency (CVID). Due to profound anasarca and inability to tolerate oral intake, albumin infusions and total parenteral nutrition were started. There was minimal response to systemic or topical steroids. Diarrhea was mildly improved with albumin repletion, and she was empirically started on vedolizumab.

Discussion: Given the absence of classic IBD findings, negative infectious and immunological testing, we present the first case of *autoimmune cryptolytic enterocolitis*, a histopathologic diagnosis of unclear etiology and pathogenesis. The patient has responded to vedolizumab infusions as an empiric treatment for an IBD-like entity. Nevertheless, supporting the autoimmune component of this entity, is a possible concomitant potential pathway of molecular mimicry in the setting of post-mycoplasma infection along with chronic high dose NSAID and OCP exposure.



[2704] **Figure 1.** Terminal Ileum and Sigmoid Colon with Diffuse Crypt Dropout.

S2705 Presidential Poster Award

A Slippery Slope: Inflammatory Bowel Disease and Transitions in Care

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Introduction: Multiple studies have showed the benefits of timely access to care in Inflammatory Bowel Disease (IBD), and lapses or delays in care can result in serious complications. Military members and dependents with IBD are a unique population with frequent transitions in care due to work-related relocations (also known as a PCS) with the following cases being illustrative of the potential adverse events associated with such transitions in care.

Case Description/Methods: The following patients were incidentally identified during a retrospective cohort study. Three patients were identified who experienced delayed treatment with biologic therapy due to a PCS. Of these patients, two with Crohn's disease (CD) were unable to receive their scheduled infusions on time. Patient 1 and 2 were 22 days late and 4 months late, respectively, for their scheduled infusions. Patient 1 required a course of oral corticosteroids to induce remission, while patient 2 required inpatient admission for intravenous (IV) corticosteroids, followed by a prolonged taper. Patient 3 was unable to finish the induction phase of his biologic for treatment of ulcerative colitis (UC) after a delay in care of 32 days, and was subsequently admitted for acute severe UC, requiring IV steroids and ultimately undergoing a total colectomy. An additional two patients with CD were identified who experienced flares shortly after a PCS, ultimately requiring surgical intervention (ileocecectomy; right colectomy, partial small bowel resection, washout, and an end ileostomy).

Discussion: IBD is a complex disease, with recent research advocating early treatment with biologic medications. While these medications can be effective at inducing remission and improving patients' quality of life, patients may experience secondary loss of response due to anti-drug antibodies. One factor that may contribute to this is a missed or late dose. Notably, delays in refills of subcutaneous biologics by only 2 days have been associated with an increased risk of flare. Additionally, the patients discussed above contribute to the growing body of evidence that demonstrates psychological stress (commonly associated with work-related relocations) as a risk factor for relapsing IBD. When patients have an upcoming transition in care, a multidisciplinary and coordinated approach to treatment should be adopted to minimize the impact of these transitions in care.

S2706

Orofacial Granulomatosis in Crohn's Disease

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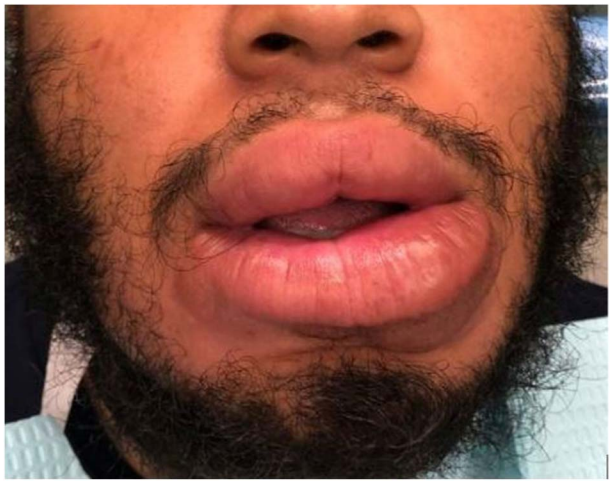
Introduction: Extra-intestinal manifestations (EIMs) of inflammatory bowel disease (IBD) are rare complications that affect roughly 6-25% of IBD patients. Orofacial granulomatosis (OFG) is a rare manifestation that does not have reliable epidemiologic data and is characterized by orofacial swelling with non-caseating granulomas seen on pathology.

Case Description/Methods: A 23-year-old male with a history of Crohn's colitis presented with loose stools and hematochezia for 7 months and 1 year of left sided lip swelling. He was diagnosed with Crohn's disease at age 15 and was maintained on oral mesalamine and 6-mercaptopurine (6-MP). At age 16, the patient was evaluated for supraglottic edema. Urgent tonsillectomy was performed, with pathology revealing necrotizing and non-caseating granulomas. He recovered without complication. He achieved endoscopic remission at age 18 and his medications were discontinued. Unfortunately, he was lost to follow-up. During this subsequent presentation, his vitals were within normal limits. Exam was notable for left-sided lip and cheek swelling without mass or lesion. Bloodwork was notable for an ESR of 19 and CRP of 7.5. Lip biopsy showed normal squamous epithelium and non-caseating granulomas, consistent with OFG. Patient was treated for a Crohn's flare with oral prednisone as a bridge to 6-MP. His OFG was treated with intralesional corticosteroids without relief and has on-going outpatient follow up. His current treatment plan includes further cycles of steroid injections before considering alternative therapies. His most recent colonoscopy showed endoscopic and histologic remission of his luminal Crohn's while on infliximab. (Figure)

Discussion: OFG is frequently seen as a manifestation of a systemic condition such as IBD. OFG is diagnosed by biopsy and clinical suspicion. OFG specific treatments include topical steroids and calcineurin inhibitors. Recent data suggests that a cinnamon/benzoate free diet may provide modest benefit to patients. Adequate treatment of underlying IBD is equally important. This patient has the classic symptoms and histopathologic findings of OFG and likely had undiagnosed OFG for many years given his tonsillar pathology years prior. Despite treatment, this patient has persistent and refractory symptoms. This case highlights a classic presentation of a rare IBD extra-intestinal manifestation and demonstrates how EIMs can occur even with well controlled IBD.



[2706] **Figure 1.** Orofacial Granulomatosis: Lip and Cheek Swelling.

S2707

Rituximab-Induced Crohn's Disease

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[1]Walter Reed National Military Medical Center, Beaufort, SC; [2]Walter Reed National Military Medical Center, Bethesda, MD.

Introduction: Rituximab (RTX) is a common therapy for several autoimmune and lymphoproliferative diseases, including hematologic malignancies. Development of autoimmune enterocolitis secondary to RTX is a rare but known adverse effect. The exact mechanism of pathogenesis is not completely understood.
Case Description/Methods: A 60-year-old woman with history of non- Hodgkin lymphoma in complete remission, on maintenance RTX therapy for 2.5 years, was referred to gastroenterology for 3 months of early satiety, abdominal pain, vomiting, constipation, and diarrhea. Symptoms occurred daily and were accompanied by 12 pounds of unintentional weight loss over this period. She had no preceding gastrointestinal disease. Colonoscopy revealed abnormal thickening of the ileocecal valve and linear ulceration in the terminal ileum (TI) that could not be traversed with the colonoscope. Colonoscopy was repeated 1 month later along with MRE, both redemonstrating inflammation of the TI. She was diagnosed with Crohn's disease based on endoscopic and radiographic findings, elevated fecal calprotectin, and symptoms. She was induced on budesonide therapy with good response, then transitioned to vedolizumab, with improvement in symptoms. Due to her atypical age of presentation, development of Crohn's disease was associated with her chronic RTX exposure.
Discussion: There have been few documented cases of RTX induced Crohn's disease, with most involving elderly patients on maintenance RTX therapy. Although not completely understood, it is suggested that the CD20+ lymphocytes, which are reduced by RTX, must play a role in the pro and anti-inflammatory equilibrium within the gastrointestinal mucosa. The depletion of B regulatory cells which secrete anti-inflammatory interleukin-10 is likely of particular importance in promoting a pro-inflammatory state. This case highlights a rare adverse effect of RTX in a patient who otherwise did not have any clear risk factors for developing inflammatory bowel disease. It is important to be aware of the possibility of Crohn's disease in a patient presenting with classical symptoms such as diarrhea, abdominal pain, and weight loss when on RTX therapy.

S2708

Acute Peritonitis: A Case of Severe Inflammatory Bowel Disease Unmasked by Pregnancy

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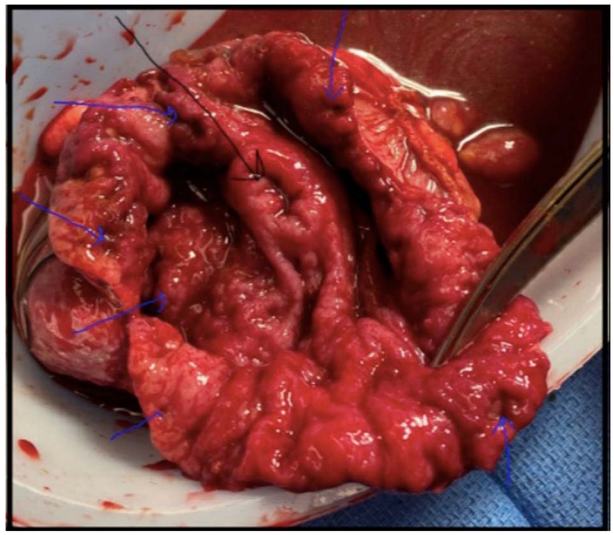
Introduction: Inflammatory bowel disease (IBD) has a well-known incidence in females of reproductive age, but IBD onset during pregnancy has not been thoroughly evaluated. This may be attributed to the fact that common diagnostic procedures are avoided in pregnant females, thereby preventing prompt diagnosis and treatment.
Case Description/Methods: A 17-year-old female, with a past medical history of recent vaginal delivery, presented to the ED with abdominal pain, rectal bleeding, and progressively worsening diarrhea. Further history reveals the patient had been complaining of bloody diarrhea, with the onset of symptoms occurring in her second trimester; however, at that time bleeding was attributed to hemorrhoids. Transvaginal ultrasound imaging was obtained and suspicious for retained products of conception for which the patient underwent dilation & curettage. On hospital day #2, the patient developed acute peritonitis with septic shock. Emergent exploratory laparotomy showed sigmoid perforation with purulent peritonitis leading to sigmoid resection. A secondary operation intended for end-colostomy creation revealed three focal areas of perforation within the cecum, which then resulted in ileocecectomy. Pathology specimens showed severely active colitis, and crypt abscess formation, with submucosal involvement in the cecum and sigmoid favoring ulcerative colitis (UC). Subsequent inflammatory workup with stool studies and C. Diff PCR was negative. On POD #16, removal of the patient's wound vac revealed a mottled transverse colon with necrosis and frank perforation of the descending colon leading to a total abdominal colectomy. (Figure)
Discussion: Diagnosis of IBD amidst pregnancy is not a well-characterized phenomenon. Some studies suggest that alteration of the gut microbiome during gestation is an inciting factor. According to one study, it is posited that pregnancy induces an inflammatory state with a Th2-related cytokine profile, which shares characteristics with the immunopathogenesis of UC. The same study found that IBD onset in pregnancy favored UC predominance, much like our patient. Overall, uncontrolled IBD is associated with increased intrapartum risks for female patients. Earlier diagnosis of IBD allows for more prompt treatment with disease-modifying agents, achieves earlier periods of disease remission, and prevents devastating complications for both mother and child. Our case highlights how delayed recognition of underlying IBD during pregnancy resulted in detrimental disease-related complications.



[2708] **Figure 1.** The Ileocecal valve is designated by a black arrowhead. Blue arrows indicate various areas of ulceration within the bowel wall.

S2709

Rituxan-Induced Colitis

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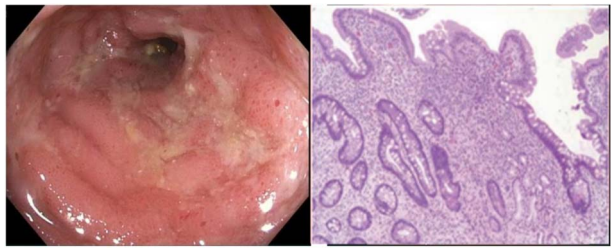
Introduction: Rituximab is a monoclonal antibody which is increasingly being used to treat autoimmune disorders and certain cancers. With this, we are also coming across Gastrointestinal toxicities. These are, however, usually self limited diarrhea and abdominal pain requiring supportive management. We present a case of a patient who developed Crohn's disease after use of Rituximab requiring long term immunosuppressive therapy.
Case Description/Methods: 67-year-old lady came in with 6 months of generalized lower abdominal pain and 7-9 episodes of watery diarrhea, along with unintentional weight loss. She had a history of well controlled Rheumatoid Arthritis/ Mixed connective tissue disease on Rituximab, failing multiple therapies in the past. CT abdomen showed Mural thickening in Terminal ileum, Cecum, and Ascending colon with enteric lymphadenopathies. The patient underwent colonoscopy for further evaluation which showed Ulceration, erythema and friable mucosa in terminal Ileum. The rest of the examined colon appeared normal. Pathology showed severe active ileitis and mild active colitis in transverse colon, while rest of segments were normal. Rituximab was stopped as a therapeutic trial which significantly improved the patient's symptoms. Her CDAI score improved from 289 points to 177 points. However Inflammatory markers, Imaging and endoscopic disease, despite improving, did not resolve completely. Ustekinumab was started after extensive discussion. After 6 months she had a complete clinical, endoscopic and histopathologic remission. (Figure)
Discussion: Gastrointestinal toxicities of Rituximab are a well-known entity. The exact pathophysiology of rituximab induced colitis however, remains unclear. B and T lymphocytes interact in the intestinal wall and are responsible for mucosal immunoregulation, which increases immune tolerance. With Rituximab induced depletion of CD20+ B cells there is an increase infiltration of T lymphocytes in the intestinal mucosa which can potentially cause an immunogenic response resulting in IBD like colitis. A rare disease, drug induced IBD is mild uncomplicated and short lived requiring only supportive management and discontinuation of offending agent. Only a few cases are reported where patient fails to improve and require Immunosuppressive therapy. More data is needed on how to differentiate between primary vs drug induced IBD in addition to finding the ideal agent to treat drug induced IBD and long term outcomes of this disease sub set.



[2709] **Figure 1.** Ulceration/inflammation in terminal Ileum.

S2710

Atypical Cutaneous Eruption to Mesalamine

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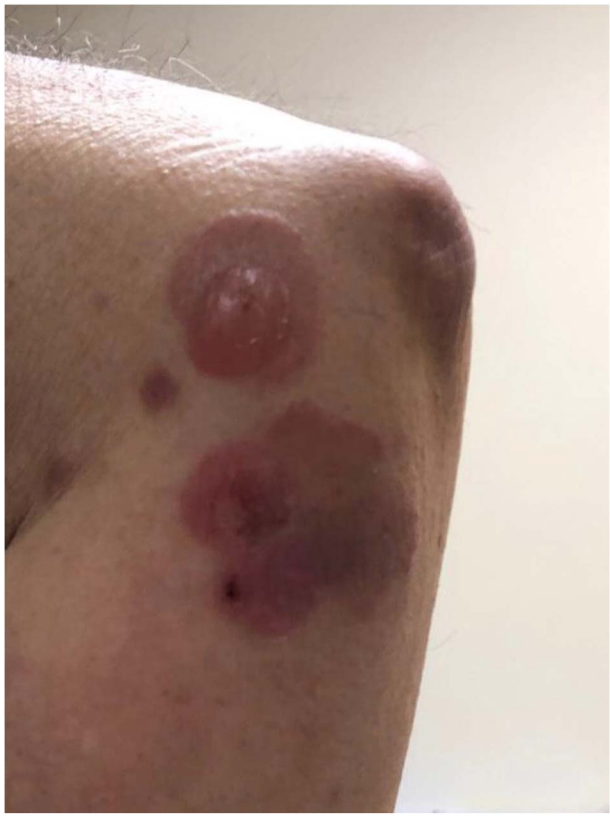
Introduction: Mesalamine, 5-aminosalicylic acid (5-ASA), is an anti-inflammatory drug that is used in the treatment of ulcerative colitis (UC). Mesalamine use is associated with rare, but well-described hypersensitivity reactions with renal, cardiac, and pulmonary involvement. We present a case of an atypical cutaneous reaction in a patient with UC associated with mesalamine therapy.
Case Description/Methods: An 85 year old male with hypertension, diabetes, and mucinous adenocarcinoma of the lung presented to inflammatory bowel disease (IBD) clinic to establish care. He was diagnosed with UC in the 1970s and had previously been treated with sulfasalazine. For lung cancer, patient was treated with pembrolizumab, which was discontinued 18 months prior. Upon presentation, he reported 1-2 bowel movements daily with intermittent blood per rectum and right lower quadrant pain. Colonoscopy done 2 years prior to presentation had demonstrated quiescent disease. The patient was started on mesalamine 4800mg daily. Two weeks after starting mesalamine, patient endorsed hypopigmented spots on scalp and torso, generalized pruritis, and bilateral foot pain. Mesalamine was stopped. Within 2 weeks, patient developed a new rash (Figure). He was urgently referred to Dermatology clinic and noted to have tense bullae and pruritic pink plaques on his torso. Punch biopsy was performed, and labs were sent including pemphigoid Ab panel that confirmed diagnosis of bullous pemphigoid (BP). Patient was started on prednisone 40mg daily for 2 weeks. At return visit in two weeks, skin lesions had resolved, and the patient was weaned from prednisone.
Discussion: We presented a case of drug-associated bullous pemphigoid (DABP) associated with mesalamine therapy. There are multiple reports of mesalamine-induced Steven Johnson Syndrome, but BP has been rarely described. Although our patient was on a PD-1 inhibitor, his discontinuation 18 months prior makes the likelihood of it causing his cutaneous symptoms exceedingly unlikely. Mesalamine-DABP is a

cutaneous manifestation of mesalamine hypersensitivity and can be recurrent upon re-introduction of mesalamine. Although a rare complication, mesalamine-DABP is an adverse event that gastroenterology providers should be aware of when starting patients on mesalamine.



[2710] **Figure 1.** Drug-associated bullous pemphigoid after mesalamine treatment.

S2711

Biologic Therapies for Isolated Recurrent, Persistent Complex Perianal Fistulas Without Luminal Crohn's Disease

Hannah W. Fiske, MD[1], Chung Sang Tse, MD[2], Sean Fine, MD, MS[3].
[1]Brown University/Rhode Island Hospital, Providence, RI; [2]UC San Diego, La Jolla, CA; [3]Brown University, Providence, RI.

Introduction: Isolated complex perianal fistulas are abnormal connections between the epithelial surfaces of the anal canal and the perianal skin, meeting criteria for complex perianal fistula but without evidence of inflammatory bowel disease (IBD). While over half of patients with Crohn's disease (CD) have perianal fistulas, isolated perianal CD is rare. Here we discuss five cases of patients presenting with isolated recurrent complex perianal fistula, and we describe their diagnostic evaluation, attempted therapies, and outcomes.
Case Description/Methods: Five adults (3 women, 2 men; mean age 38 years old) with no prior GI symptoms/diseases initially presented with perianal pain (3/5), perirectal mass (2/5), diarrhea (1/5), and abdominal pain (1/5) (Table). All patents underwent exam under anesthesia (EUA) with incision and drainage (I&D) of perirectal abscesses, and setons were placed in perianal/rectal fistulas in 4/5 cases. Each patient had colonoscopy without evidence of inflammation on endoscopy or histology. Radiographic imaging (MRIs, MREs, and CT) revealed fistulas and abscesses but no evidence of luminal inflammation. All patients were treated with antibiotics and 4/5 received biologic therapy (Adalimumab, Infliximab, or Ustekinumab). Despite surgical and medical management, complex perianal fistulas were persistent in all patients at follow-up after an average of 45 months.
Discussion: For patients who develop recurrent complex fistulas, a presumptive diagnosis of CD is often made. However, patients who present with complex perianal fistulas in the absence of the luminal inflammation characteristically found in CD are said to have isolated perianal disease (IPD). It is unclear whether IPD represents truly isolated severe cryptoglandular fistulas or early presentation of undiagnosed CD, which renders the best treatment approach a clinical dilemma. IPD is classically treated with antibiotics and local surgical intervention, whereas perianal CD treatment is more complex, incorporating the use of immunosuppressive therapy. The cases described in our cohort reveal the importance of a multimodal approach when treating IPD in the absence of luminal findings of CD. While classic medications for CD are unlikely to succeed when used alone for IPD, their incorporation into the treatment regimen may be critical in achieving eventual resolution of perianal disease. Given the similarity in management, it is important to consider CD in the differential for IPD patients even in the absence of luminal findings.

Table 1. Patient Summary

PT #	Initial Presentation	Diagnostic Evaluations	Subsequent Diagnosis	Medical Therapies Attempted	Surgical Procedures	Ultimate Diagnosis and Plan
(1) 39F	Painful perianal mass, presumed to be an abscess or hemorrhoids	Flexible sigmoidoscopy Colonoscopy with bx MRI EUA	Refractory perirectal and rectovaginal fistula with abscess	**IBD medications:** Adalimumab Methotrexate **Non-IBD medical therapies:** Ciprofloxacin Metronidazole Amoxicillin-Clavulanic acid Prednisone	I&D Seton placement Fistulectomy with sphincterotomy Diverting sigmoid colostomy Fistulotomy	Non-healing cryptoglandular anal fistula complicated by surgery Discontinue IBD therapy Surgical f/u with consideration for clinical trial of stem cell injection or transperitoneal repair
(2) 34M	Abdominal pain, diagnosed with sigmoid diverticulitis	Colonoscopy with bx MRI MRE CT scan EUA	Refractory perianal fistula with abscess	**IBD medications:** Infliximab Ustekinumab Tacrolimus Azathioprine **Non-IBD medical therapies:** Metronidazole Ciprofloxacin	I&D Seton placement	Isolated perianal disease in the setting of presumed CD Chronic treatment with chronic, cyclical abx (Ciprofloxacin or Amoxicillin-Clavulanic acid IBD-directed therapy (Azathioprine + Infliximab; will consider Upadacitinib once approved by the FDA) Planning for surgical f/u
(3) 43M	Painful perianal mass, presumed to be a rectal abscess	Colonoscopy with bx MRI EUA	Refractory perianal abscess	**Non-IBD medical therapies:** Amoxicillin-Clavulanic acid	I&D	Isolated cryptoglandular abscess with potential hemorrhoids No need for chronic antibiotics Sitz baths and PrepH as needed If symptoms worsen will plan for EUA and surgical f/u
(4) 24F	Perianal pain, diagnosed as perianal abscess with fistula	Colonoscopy with bx MRI EUA	Refractory perianal abscess, inflammatory arthropathy	**IBD medications:** Adalimumab Infliximab Azathioprine **Non-IBD medical therapies:** Ciprofloxacin Metronidazole	I&D Seton placement	Presumed CD with perianal disease and inflammatory arthropathy IBD-directed therapy (Azathioprine + Infliximab) Planning for surgical f/u
(5) 50F	Diarrhea and rectal ulcers, presumed to have CD	Colonoscopy with bx MRI CT EUA	Refractory perianal fistula with abscess	**IBD medications:** Infliximab **Non-IBD medical therapies:** Colchicine Prednisone	I&D Seton placement Perineal debridement Lay open fistulotomy	Presumed CD with perianal disease IBD-directed therapy (Infliximab)

Abbreviations: Bx = biopsies. CD = Crohn's disease. EUA = exam under anesthesia. F = female. F/U = follow up. I&D = incision and drainage. IBD = inflammatory bowel disease. M = male. MRE = magnetic resonance elastography. MRI = magnetic resonance imaging

S2712

Capecitabine-Induced Ileitis vs Late-Onset Crohn's Disease: A Case Report

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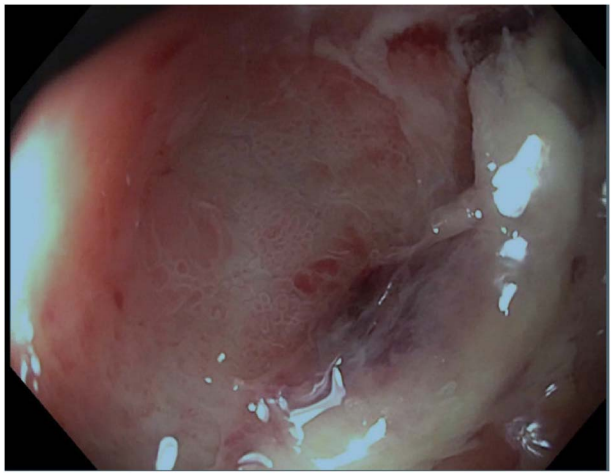
Introduction: Ileitis is most commonly thought to be related to Crohn's disease. Other causes do exist, including infection, vasculopathy, ischemia, neoplasm, medication induced, and eosinophilia. Proper diagnosis relies upon clinical course, systemic manifestations, appearance on imaging and endoscopy, and histological analysis. Making the correct diagnosis is integral to management of the underlying disease. Here we present a case of long segment ileitis caused by capecitabine vs late-onset Crohn's disease.

Case Description/Methods: A 72 y.o. male with a history of cholangiocarcinoma (CCA) who had left hepatic lobe trisegmentectomy and Roux-en-Y hepaticojejunostomy with lymphadenectomy followed by chemotherapy with capecitabine 3 months later. He was admitted for nausea and vomiting 2 months after this was initiated. CT abdomen revealed distal ileitis with upstream distention. A colonoscopy was performed, showing severe inflammation with ulceration in the terminal ileum. Biopsies showed chronic active inflammation and cryptitis with crypt abscesses, concerning for Crohn's disease. MRI enterography showed long segment ileitis. He began a prednisone taper, and capecitabine was stopped. He clinically improved and was discharged home. At follow-up in GI clinic, his symptoms had significantly improved. Because of the temporal association between the initiation of capecitabine and the patient's symptoms, the decision was made to monitor the patient clinically and only consider starting biologic agents if he had persistent symptoms and endoscopic findings consistent with Crohn's disease. (Figure)

Discussion: This case illustrates the potential overlap between chemotherapy induced ileitis and Crohn's disease. Our patient had a history of CCA, but hepatic resection did not show evidence of primary sclerosing cholangitis (PSC). Previous ERCP did show dilation of the common bile duct and intrahepatic bile ducts, but this may have been related to his malignancy. Because of the correlation between CCA, PSC, and inflammatory bowel disease, this makes Crohn's disease a likely possibility. However, there have been multiple cases of capecitabine induced ileitis in the literature. Patients with capecitabine induced ileitis were found to improve with discontinuation of the medication and occasionally steroids whereas Crohn's Disease would require additional therapy with biologic agents. The proper diagnosis is integral to treatment, so further evaluation is indicated.



[2712] **Figure 1.** Terminal Ileum Ulcer.

S2713

Biomarkers, Imaging and Pain: An Interesting Overlap of Disease Presentations

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Introduction: The association between acute pancreatitis and ulcerative colitis is described in literature, with a majority of pancreatitis in this population being drug-induced. Endoscopic modalities offer a pathway to diagnosis and is a mainstay in differentiating IBD and associated conditions such as autoimmune pancreatitis. In these situations procedural approach to diagnosis should always be guided by clinical gestalt.
Case Description/Methods: A 20-year old male presents to his primary doctor with 1 month history of epigastric abdominal pain, constipation alternating with diarrhea, and occasional hematochezia. Family history is significant for a brother with idiopathic pancreatitis. Initial work-up was significant for an elevated lipase. He was then evaluated in the ED with a CT abdomen unrevealing for pancreatitis, but significant for mild sigmoid wall thickening. He was discharged home with opiates, anti-emetics and a clear liquid diet for presumed pancreatitis. Despite outpatient IV fluids and pancreatic enzyme replacement, he continued to have epigastric abdominal pain, immediate postprandial diarrhea, and weight loss concerning for pancreatic insufficiency. MRI abdomen was pursued and unrevealing of pancreatitis, however IgG 4 level was elevated and he was subsequently referred for EUS to rule out autoimmune pancreatitis. Due to ongoing diarrhea and weight loss, he first underwent EGD and colonoscopy which was significant for moderate inflammatory changes in the stomach and duodenum including the papilla, as well as diffuse inflammation and ulceration throughout the entire colon. Biopsies revealed chronic proctitis and colitis as well as chronic gastritis and duodenitis. The colonoscopy and histological findings suggested a diagnosis of UC with contiguous extension into the upper GI tract. Patient was initiated on prolonged prednisone taper, resulting in modest improvement of diarrhea and abdominal pain. Maintenance therapy with infliximab and azathioprine was pursued.
Discussion: This case illustrates a patient with moderate to severe ulcerative colitis with upper GI tract involvement presenting as acute pancreatitis. This patient's acute pancreatitis acted as a red herring in determining diagnosis, and while lipase elevation and abdominal pain is characteristic of pancreatitis, it may also be elevated in small bowel disease. In addition, IgG 4 also has poor specificity for pancreatic disease and elevation without other evidence of pancreatitis may suggest another underlying condition such as IBD.

S2714

Case Report: *Mycobacterium paragordonae* Associated Crohn's Disease

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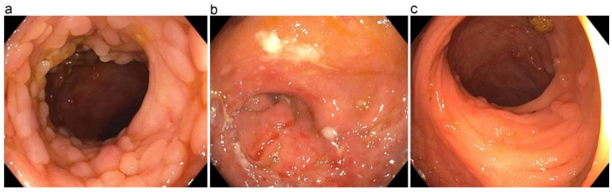
Introduction: We are reporting a case of Mycobacterium Paragordonae (M. Paragordonae) related to Crohn's disease (CD).
Case Description/Methods: A 44-year-old man presented with right-sided abdominal pain and non-bloody diarrhea. No weight loss or fevers. Labs were significant for calprotectin 117 ug/g and negative infectious stool studies. CT scan showed thickening of the ascending colon. Colonoscopy demonstrated ulcerated mucosa with pseudopolyps from the cecum to the hepatic flexure with pathology of crypt abscesses and poorly formed noncaseating granulomas, which was consistent with Crohn's colitis (Figure a & b). Capsule endoscopy was negative for small bowel disease. While waiting to start biologics, mesalamine was started. A repeat colonoscopy 6 months afterwards continued to show right-sided colitis. Meanwhile, the QuantiFERON-TB gold test was found to be positive. Chest X-ray showed fibronodular changes within the lung apices bilaterally. Sputum acid-fast smear was negative, but culture was positive. Further identification showed M. Paragordonae. While pending the final speciation of mycobacterium, treatment with 4-drug RIPE treatment was initiated for concern of possible active tuberculosis. The patient refused to continue the full RIPE treatment due to side effects. Therefore, it was decided to continue isoniazid and rifampin daily for another 5 months. The patient's symptoms improved significantly. Repeat colonoscopy after treatment showed markedly improved colitis (Figure c).
Discussion: The relationship between CD and mycobacterium species needs further elucidation. Both CD and tuberculosis (TB) can cause granulomatous inflammation of the GI tract, which can be difficult to distinguish. Although histopathologically similar, caseating granulomas are seen in TB. It has also been suggested Mycobacterium avium subspecies paratuberculosis (MAP) as an etiology for CD since it is more prevalent in CD patients. Reports of these patients have shown remission after mycobacterial treatment. Although the histopathology of our patient is consistent with CD, there was significant improvement after mycobacterial treatment. Although M. Paragordonae is a nontuberculosis species, it is unclear if this may reflect the variability of culture sensitivity in detecting TB or a new mycobacterium associated with CD, as previously seen with MAP. Nonetheless, this case emphasizes the importance of having a high suspicion for TB in suspected CD. If identified correctly, these patients can be promptly started on treatment.



[2714] **Figure 1.** Colonoscopy on inital presentation(a & b) and after RIPE treament (c).

S2715

Clinical Correlation Recommended: Appendiceal Crohn's Masquerading as Acute Appendicitis on CT

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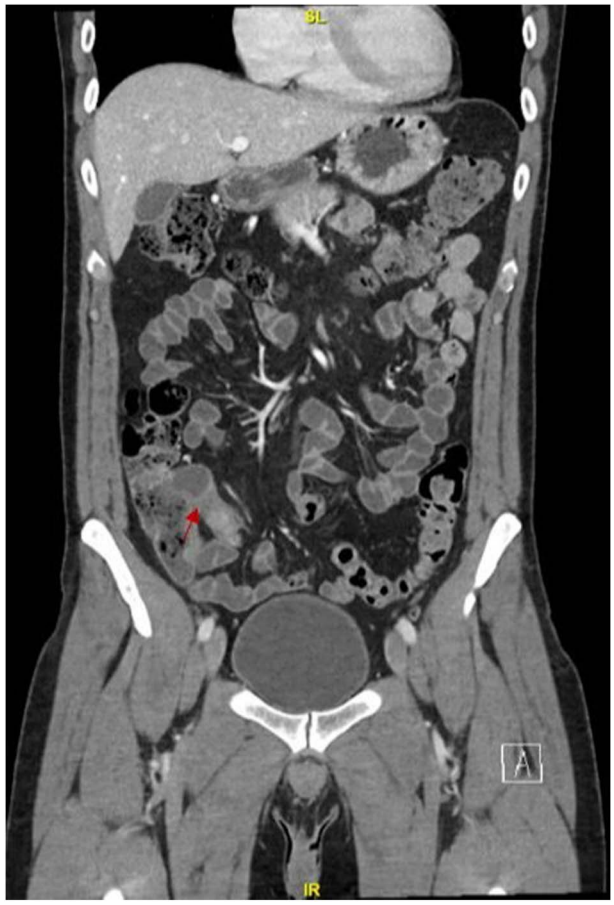
Introduction: Granulomatous appendicitis is uncommon, often caused by Crohn's disease (CD), infiltrative disease (ie sarcoidosis), or infection (ie Yersinia). We report an unusual presentation of CD limited to the appendix.
Case Description/Methods: A 46-year-old male with celiac disease presented to clinic for evaluation of intermittent epigastric and right upper quadrant (RUQ) abdominal pain occurring four times per year. When present, the pain was constant, pressure-like and gradually worsened over a three-day period. He denied nausea or vomiting, but reported non-bloody diarrhea with episodes. His symptoms persisted despite a gluten free diet and normalization of celiac serologies. In the clinic, he was afebrile with normal vital signs. Abdominal exam demonstrated mild tenderness to deep palpation of the RUQ. CT enterography demonstrated inflammation around his appendix, terminal ileum, and right ureter concerning for acute appendicitis (Figure). Given incongruity of his mild clinical presentation and chronicity of his symptoms, he underwent colonoscopy which showed inflammation of the appendiceal orifice, surrounding cecum, and distal rectum. Biopsies of the rectum and cecum demonstrated active inflammation without chronicity, with a normal terminal ileum. Due to evidence of active inflammation of unknown etiology, he underwent laparoscopic ileocecectomy with anastomosis. Pathology findings were consistent with moderately active Crohn's colitis isolated to the appendix. He had no signs or symptoms of extra-intestinal manifestations of inflammatory bowel disease. Following surgery, his symptoms resolved and repeat CT six months later demonstrated resolution of inflammation. The patient remains asymptomatic without CD treatment.
Discussion: Isolated appendiceal CD is a rare entity that is most often seen in men in their 20-30s. It typically presents with acute right lower quadrant pain, occasionally with diarrhea, lasting 0-14 days, but can become protracted. Our patient's history and nontoxic exam did not fit acute appendicitis as initially suspected on CT scan, instead suggesting a chronic process such as CD. There is no consensus regarding surveillance and treatment of isolated appendiceal CD. Recurrence rates after appendectomy are low, suggesting that appendectomy alone is a sufficient treatment for isolated disease. It was therefore recommended that this patient return for further evaluation based on symptoms alone, rather than undergo surveillance.



[2715] **Figure 1.** CT Abdomen Pelvis Enterography with IV Contrast demonstrating appendiceal inflammation.

S2716

CMV in IBD: An Innocent Bystander, or Active Pathogen?

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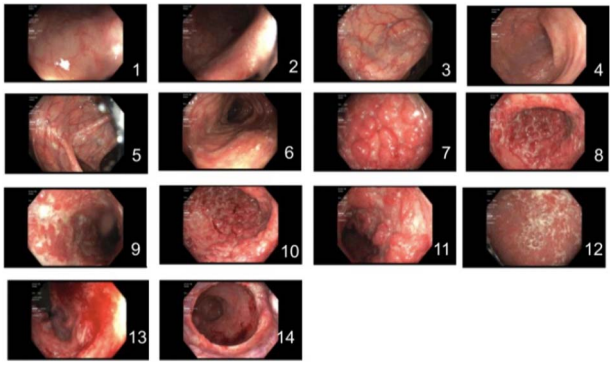
Introduction: Ulcerative Colitis (UC) is a gastrointestinal inflammatory disease that affects over 6 million people worldwide. Clinical manifestations of UC such as bloody diarrhea and abdominal pain can often mimic an infectious colitis, such as cytomegalovirus (CMV) colitis. Often a silent infection, CMV has a worldwide seroprevalence of 83%. We present an interesting case of a UC patient with biopsy positive CMV colitis, who symptomatically improved on steroids and mesalamine alone.
Case Description/Methods: A 66 year old African American female with a history of well-controlled UC was evaluated for acute onset bloody diarrhea and abdominal pain. Following negative stool studies for infection, the patient underwent colonoscopic evaluation. Preliminary imaging and results demonstrated a left-sided UC flare extending from the rectum to the splenic flexure. The patient was started on pulse dose steroids with instructions to taper as an outpatient and experienced resolution of symptoms. Biopsy revealed CMV with subsequent serologic testing showing a CMV viral load of < 390 cpy/mL, IgM level of 45.4 AU/mL and negative IgG levels. Interestingly, the patient's acute gastrointestinal symptoms resolved with glucocorticoid treatment.
Discussion: CMV reactivation is common in patients with moderate to severe UC. Symptoms of diarrhea, bloody stool, abdominal pain and complications such as megacolon, fulminant colitis and perforation often overlap in both CMV and UC. Endoscopic evaluation can provide a more definitive means of differentiating CMV colitis from an acute exacerbation of UC, however, may not be able to be quickly

performed before complications arise. There has been much debate on the role of CMV in UC and whether it is an active pathogen contributing to the inflammatory state or simply a surrogate marker for disease severity. Multiple studies have demonstrated an association of CMV antigenemia with endoscopically significant severe UC. In such patients, after detection of CMV in the colon with biopsy, treatment with antiviral therapy and withdrawal of immunosuppressive agents would be expected to induce clinical response. Continuation of immunosuppressive therapies was associated with adverse events such as fulminant colitis and colectomy. (Figure) Differentiating an active CMV infection versus a UC flare can be challenging given the wide overlap of symptoms. Colonoscopic evaluation is important in supplementing a diagnosis with histopathological confirmation of CMV and can help guide treatment.



[2716] **Figure 1.** Inflammation characterized by friability, loss of vascularity, mucous, pseudopolyps and deep ulcerations was found in a continuous and circumferential pattern in the terminal ileum (1,2), hepatic flexure (3), transverse colon (4,5,6), descending colon (7,8), sigmoid colon (9,10,11), and rectum (12,13,14). This was graded as Mayo Score 3 (severe, with spontaneous bleeding, ulcerations).

S2717

Double Trouble: Concomitant Tuberculosis and Histoplasmosis Following TNF-a Inhibitor Treatment for Crohn's Disease

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Introduction: Tumor necrosis factor (TNF)-a inhibitor (TNFI) therapy has improved clinical response and remission rates in patients with IBD, however their use has been associated with increased susceptibility to infection. We present a case of concomitant pulmonary *Mycobacterium tuberculosis* (TB) and *Histoplasmosis capsulatum* in a patient with Crohn's disease receiving Adalimumab. Co-infection is rare, and most cases have been reported in patients with HIV. One case of co-infection with TNFI has been reported, however, the patient had positive TB tests prior and was not treated. Our case is unique as our patient is HIV-negative and had negative TB screening.
Case Description/Methods: A 74-year-old female with Crohn's disease treated with Adalimumab, for 9 months, presented with a 3-month history of weakness, headache, dyspnea on exertion, fatigue, weight loss, subjective fevers and dizziness. Labs showed Hgb 7.6 g/dl, AST 89 IU/L, ALT 83 IU/L, ALP 666 IU/L. Computed tomography showed bilateral ground glass spiculated pulmonary nodules, mediastinal lymphadenopathy, and pleural thickening. Pulmonary histoplasmosis was diagnosed from methenamine silver stain of bronchial washings and treated with liposomal amphotericin B (transitioned to itraconazole). After worsening symptoms, TB PCR from bronchoalveolar lavage was positive and rifampin, isoniazid, pyrazinamide and ethambutol (RIPE) was initiated. The patient was readmitted after 10 days with recurrence of symptoms and subtherapeutic itraconazole levels. Despite switching to liposomal amphotericin B, symptoms worsened, and pneumonia or immune reconstitution inflammatory syndrome was suspected. The patient was placed on respiratory support, antibiotics and liposomal amphotericin B. Symptoms resolved and the patient was discharged on itraconazole, and RIPE with moxifloxacin substituted for rifampin.
Discussion: This was a challenging case for diagnosis and treatment due to overlapping symptoms, similar lab and radiographical findings, drug-drug interactions and worsening of symptoms despite therapy. Physicians must exercise a high clinical suspicion for co-infection of TB and other pathogens, particularly in patients with a complicated disease course and in endemic regions. In co-infection with histoplasmosis, alternate therapies should be considered due to an itraconazole-rifampin drug interaction. In TNFI-associated infections, a paradoxical worsening of symptoms should raise concern for immune reconstitution inflammatory syndrome secondary to TNFI cessation.

S2718

De Novo Crohn's Disease 3 Years Following Immune Checkpoint Inhibitor Therapy

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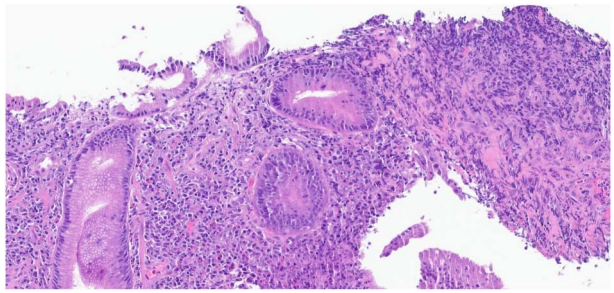
Introduction: Immune Checkpoint Inhibitors (ICIs) have become a common treatment for multiple malignancies. Side effects involving the gastrointestinal (GI) tract include an IBD-like enteritis or colitis. However, most of these described side effects occur during or soon after the discontinuation of ICI therapy. In this report, we describe a rare case of Crohn's disease diagnosed over three years after the completion of pembrolizumab therapy.
Case Description/Methods: A 71-year-old white male without significant co-morbidities diagnosed with melanoma of the trunk with nodal metastases and initiated on pembrolizumab treatment. During 20 months of successful ICI treatment, he did not experience dose-limiting adverse effects. Over a year after discontinuation of ICI, he developed mild epigastric pain and diarrhea. Upper endoscopy with biopsies demonstrating superficial gastritis and chronic duodenitis with normal villous architecture. A colonoscopy without terminal ileum examination was unremarkable. The gastritis and duodenitis were attributed to NSAID use which was then discontinued. However, he continued to have intermittent abdominal pain, diarrhea, and developed an unintentional fifteen-pound weight loss. Three years after pembrolizumab discontinuation, a CT enterography demonstrated multiple small bowel strictures concerning for Crohn's disease. Laboratory work up revealed a CRP of 34.2, hemoglobin of 11.6 (MCV 88.2), and no evidence of vitamin D or B12 deficiencies. Ultimately, anterograde double balloon enteroscopy revealed ulcers in the jejunum with associated strictures. Biopsies displayed active, chronic enteritis with ulceration. No dysplasia was detected and CMV immunostaining was negative. He was diagnosed with stricturing jejunal Crohn's Disease and was started on vedolizumab with subsequent clinical and radiographic response. (Figure)
Discussion: Cases of de novo IBD following ICI therapy have been reported and are believed to arise due to induced autoimmunity as well as distortion of the gut microbiome. This case's clinical, radiographic, endoscopic, and histologic data support a diagnosis of Crohn's disease. However, previous reports of ICI-associated IBD also reported acute colitis/enteritis that required ICI termination. This case is atypical as the patient experience no acute ICI related side effects. In summary, this case serves as an example of potential GI-related, long-term autoimmune implications of ICI therapy, even in patients without acute side effects.



[2718] **Figure 1.** Biopsy of a proximal jejunal ulcer displaying mild to moderate, active, chronic enteritis with ulceration consistent with inflammatory bowel disease.

S2719

Diagnosing Visceral Kaposi Sarcoma: The Necessity to Avoid Anchoring on the Diagnosis of a Crohn's Flare

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Introduction: Inflammatory bowel disease (IBD) and human immunodeficiency virus (HIV) affect the immune system in inverse means, IBD causes an overdrive of the immune system whereas HIV suppresses it. The decline in CD4+ count in HIV is believed to promote remission of IBD by decreasing inflammatory responses.
Case Description/Methods: We present a 45-year-old male with a self-reported history of Crohn's disease (CD) complaining of bloody diarrhea and weight loss that he presumed to be the result of a Crohn's flair. He was afebrile and tachycardic with multiple violaceous plaques on his left leg and left lower quadrant abdominal tenderness on exam. Labs were significant for anemia, elevated C-reactive protein, erythrocyte sedimentation rate, and fecal calprotectin. Abdominal computed tomography angiography revealed mild mural thickening in the mid to distal esophagus, mesenteric adenopathy, and wall thickening of the ascending colon. To rule out infectious causes, *Clostridium difficile* and gastrointestinal pathogens panel were collected and resulted as negative. The patient's course was complicated by sepsis of unknown etiology. Further investigation revealed his lower extremity lesions were recently biopsied establishing a diagnosis of Kaposi Sarcoma (KS). Initiation of high-dose glucocorticoids for possible Crohn's flare was deferred in light of this. Despite previous negative results, HIV antigen was positive with a CD4+ count of 58 cells/mm^3 and viral load >1,000,000 copies/mL. Upper endoscopy and colonoscopy demonstrated many 10 to 50 mm violaceous nodules in the esophagus, duodenum, and throughout the colon consistent with KS. This was confirmed immunohistochemistry positive for CD34 and HHV8. The KS was staged as Tumor 1 (visceral disease), Immune system 1 (CD4< 200), Systemic illness 1 (B symptoms). He was started on paclitaxel, with anti-retroviral therapy held due to increased risk of immune reconstitution inflammatory syndrome.
Discussion: KS in patients with HIV and IBD is extremely rare with a prevalence of 0.4%, and, visceral KS is rarely present with initial diagnosis of HIV. We demonstrate the risks of anchoring on a CD diagnosis of CD, as it is possible HIV would have been missed and starting treatment of CD could have been very harmful as high-dose steroids have been shown to further progress KS. We share this truly rare case of visceral KS in a patient with newly diagnosed HIV masquerading as a CD flare to promote broadening the diagnostic arsenal where the picture of IBD is not clear cut.

S2720

Crohn's Disease Manifesting as a Jejunal Obstruction at Diagnosis

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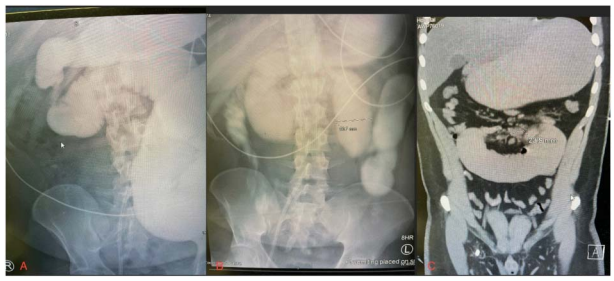
Introduction: Crohn's disease is an inflammatory bowel disease caused by transmural inflammation and may affect any portion of the luminal gastrointestinal tract. It is commonly associated with abdominal pain, fatigue, weight loss and diarrhea as the initial presentation. It is vastly uncommon that Crohn's disease is diagnosed as a bowel obstruction as it initial presentation. We present a gentleman whose initial presentation of Crohn's disease was a small bowel obstruction from an inflammatory mass.
Case Description/Methods: Patient is a 21-year-old male with no significant past medical history who presented to the ED with myalgias, abdominal pain, nausea, and vomiting for one month. He was recently seen at a different hospital for similar symptoms. He underwent EGD which showed Mallory Weiss tears in the esophagus and a gastric emptying study which showed abnormal transit of solids and liquids. He was treated at that time for gastroparesis. On this admission, he had a normal gastric emptying study. He continued to have large amounts of emesis in amounts over one liter in volume. A CT abdomen and pelvis with oral contrast showed marked distention and dilation of the duodenum to the level of the superior mesenteric artery to where there was relative obstruction and moderate narrowing and a stricture in the proximal to mid jejunum with mesenteric nodal prominence. A small bowel series with gastrografin had similar findings. Patient underwent a laparoscopic small bowel resection where a small bowel mass at the level of the mid jejunum was found, causing focal narrowing and partial obstruction. The mass pathology revealed a central structure with mural thickening and features suggestive of Crohn's disease. His post operative course was unremarkable, and he followed up with gastroenterology outpatient for evaluation and treatment of his new diagnosis of Crohn's disease. (Figure)
Discussion: Crohn's disease includes a wide collection of clinical presentations. Small bowel obstruction progresses in moderate to severe cases of Crohn's, which typically is a chronic issue. To our knowledge, one other case report has been published with the initial presentation of Crohn's disease manifesting as an obstruction. Our patient had misleading initial work up and isolated jejunal involvement without other intestinal involvement which may have contributed to the delay in his diagnosis.



[2720] **Figure 1.** Left and middle panels reveal the small bowel series with small intestine narrowing and dilatation. Right similarly reveals small bowel dilation and mesenteric nodal prominence.

S2721

Cytomegalovirus in Severe Ulcerative Colitis: Primary Villain or Innocent Bystander?

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Baystate Health, Springfield, MA.

Introduction: Cytomegalovirus (CMV) infection in severe ulcerative colitis (UC) is thought to either be the cause or the result of steroid resistant ulcerative colitis. The cause of this discrepancy is due to conflicting study results. These occur because of poor detection techniques for CMV in tissue samples compounded by unclear distinction between the type of inflammatory bowel disease (i.e. Crohn's vs UC) affected in the case description. Our goal is to add to the existing body of evidence of CMV infection in UC towards improving evidence based management and care and also highlight the diagnostic and management conundrum prevailing at this time through the following case.
Case Description/Methods: A 69 year old male presented in the outpatient setting with several months of bloody diarrhea and was found to have UC of the whole colon through colonoscopy. Biopsy results did not find any dysplasia nor granulomata. CMV immunohistochemistry was negative. Patient was on Sulfasalazine for two weeks before he presented for inpatient admission with voluminous bloody diarrhea ongoing for several days. After Clostridioides Difficile (CDiff) testing was negative, steroid therapy was started. After 3 days, steroid resistant disease was determined and patient was transitioned to Infliximab with some initial improvement. He had significant deterioration after 4 days of treatment and was then found to be CDiff positive for which oral Vancomycin was initiated. A flexible sigmoidoscopy was performed, revealing extensive inflammation with spontaneous bleeding and evidence of ulceration. Biopsy results indicated CMV coinfection this time. Intravenous Ganciclovir treatment was initiated. However, patient had no improvement after three days of antiviral therapy and hence underwent colectomy with end ileostomy.
Discussion: Current guidelines recommend treatment with 14 days of Ganciclovir in CMV infection in UC. However, due to conflicting evidence, they do not recommend delaying colectomy until a full course of antiviral medication management is complete. As surgical intervention, especially those resulting in stoma, have significant negative burden on quality of life for patients, it is important to expediently work towards evidence based consensus on treatment and management of this condition. Improving the quality and quantity of clinical data through case reports and series along with better detection techniques for CMV are the first steps towards this goal.

S2722

Cytomegalovirus Colitis in an Immunocompetent Patient Presenting With New Onset Ulcerative Colitis: A Clinical Vignette

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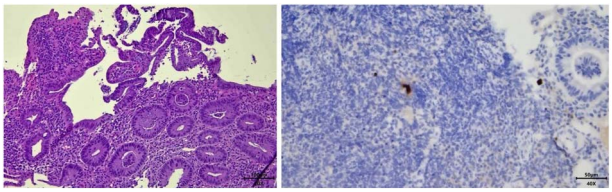
Introduction: *Cytomegalovirus* (CMV) colitis is a rare disease among immunocompetent patients presenting with inflammatory bowel disease (IBD). CMV can cause steroid-refractory IBD, which may require antiviral and infliximab (IFX) combination therapy.
Case Description/Methods: A 23-year-old woman was admitted for dehydration and poor oral intake in the setting of eight bloody bowel movements per day, tenesmus, and weight loss. She presented to an outside hospital 5-weeks prior with abdominal cramps and bright red blood per rectum. The CT scan showed bowel wall thickening and mucosal enhancement in the rectosigmoid and descending colon. A colonoscopy 2-weeks prior to admission was suggestive of severe ulcerative colitis (UC) and she was started on mesalamine/budesonide. Due to poor clinical response, she was switched to prednisone 40 mg for 5 days. Outpatient medical management failed and, upon admission, she was converted to methylprednisolone 20 mg every eight hours. Serum CMV PCR was positive at 1,758 IU/mL and colonic biopsies showed scattered CMV inclusions by immunohistochemical staining. She was started on ganciclovir 5mg/kg/dose IV in addition to the steroid regimen and IFX infusions were deferred. By day 2 of ganciclovir IV and day 7 of methylprednisolone IV, IBD symptoms began to resolve. On discharge at hospital day 12, patient was transitioned to twice daily oral valganciclovir 900 mg for a 3-week course and an oral prednisone taper. CMV PCR was 1,185 IU/mL on discharge and $<$ 100 IU/mL at one week follow up. IFX therapy was initiated 45 days post discharge with improved symptoms, as characterized by a 17-lb weight gain at 3-month follow-up. (Figure)
Discussion: CMV colitis is a rare diagnosis in immunocompetent patients with early, steroid naïve IBD. Serum PCR positive infection has been reported more commonly after 2-3 weeks of steroid therapy. CMV infection is a recognized complication and marker of poor prognosis in moderate to severe UC, especially those who present with steroid refractory disease. It is believed that the inflammatory mediators associated with UC play a synergistic role in CMV reactivation and subsequent disease. In addition, local corticosteroid induced immunosuppression may further facilitate CMV gene transcription, resulting in disease progression and poor steroid response. There remains no consensus for management of UC with concomitant CMV colitis however, in our patient the use of antiviral and biologic therapy (IFX) promoted disease regression and clinical improvement.



[2722] **Figure 1.** H&E Stain (20x) demonstrating active chronic colitis (left). Immunohistochemical staining (40x) showing CMV immunoreactivity (right).

S2723

Endoscopic Treatment of Pouchocele

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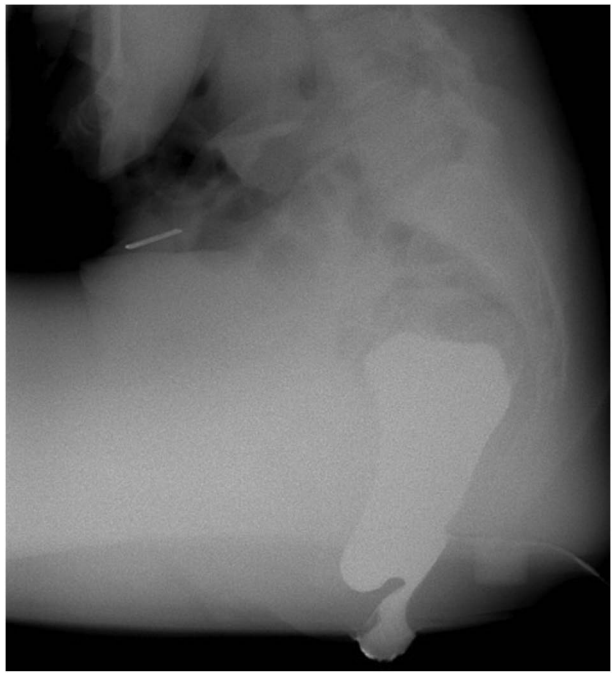
Introduction: Ileal pouch-anal anastomosis (IPAA) is a standard treatment option for patients with medically refractory ulcerative colitis (UC), UC-associated neoplasia, or familial adenomatous polyposis (FA) who require colectomy. However, this procedure is often associated with various adverse sequelae, one such rare complication being pouchocele, a form of floppy pouch complex, which describes the bulging of the anterior pouch wall into the vagina or perineum. Little is known about the management of pouchocele due to it being a rare complication. We describe a case in which a pouchocele was successfully treated with endoscopic banding ligation.
Case Description/Methods: A 53-year-old woman who underwent a staged restorative proctocolectomy and IPAA for medically-refractory UC in 2019 presented with dyschezia, incomplete evacuation, and weight loss of 40 pounds. Barium defecography performed in February 2021 showed difficult evacuation due to an anterior pouchocele and a thick fold projecting into and narrowing the lumen of the pouch posteriorly (Figure). The pouchocele was treated with banding (Boston Scientific Corporation, Marlborough, MA, USA) x 7 with submucosal injection of 50% glucose. The pouchocele was further treated in the same manner during additional procedure performed in April 2021 and June 2021. After the 3 sessions of endoscopic therapy, the patient's symptoms resolved. Repeat defecography in July 2021 showed that the anterior pouchocele became significantly smaller, with minimal associated incomplete evacuation.
Discussion: There are many structural complications following IPAA that can cause mechanical obstruction. Floppy pouch complex refers to disorders in which redundant pouch or bowel leads to luminal angulation or obstruction. Pouchocele often coexists with pouch prolapse, which may be mucosal or full-thickness, and anterior, posterior, or circumferential. Patients can present with symptoms such as dyschezia, incomplete evacuation, weight loss, and frequent passing of stools. These symptoms can affect quality of life. Here, we describe the treatment of a pouchocele using banding with good results. This is a novel treatment and has not previously been described.



[2723] **Figure 1.** Barium defecography before treatment.

S2724

EBV as a Very Unusual Etiology of Mucocutaneous Ulcer of the Neo-Ileum in a Patient With Crohn's Disease

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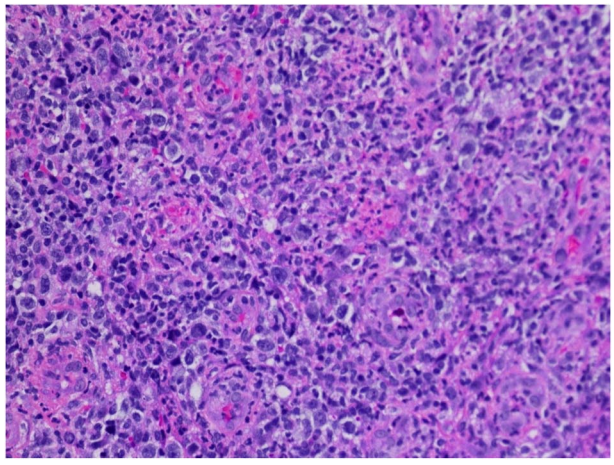
Introduction: A member of the herpes virus family, Epstein Barr virus (EBV) is one of the most common human viruses. It can cause latent infections in humans, leading to serious health complications, including lymphomas and lymphoproliferative disorders. Mucocutaneous ulcers associated with EBV (EBVMCU) are a recently established entity of the lymphoproliferative disorders in 2010.
Case Description/Methods: An 82-year-old male with Crohn's disease s/p right hemicolectomy with the formation of neo-ileum seven years earlier, bladder cancer, lung cancer s/p lobectomy in remission for both cancers. He presented to the hospital complaining of bright red blood per rectum. He reports chronic loose stools attributed to a history of Crohn's disease and right hemicolectomy seven years earlier when 30 cm colon was removed, including terminal ileum to the proximal transverse colon. The patient reports that he believed his Crohn's was never symptomatic and was worried about the side effects of biologic Crohn's treatment, which he refused in the past. Colonoscopy revealed extensive ulceration at the neo-ileum with friable mucosa. The histology shows scattered large atypical EBV-positive cells of B cell lineage in inflamed and ulcerated mucosa with granulation tissue. A definitive diagnosis could not be made, and further biopsies were recommended. PET scan and CT scan were unremarkable for metabolically active malignant lesions or lymphadenopathy. Colonoscopy repeated two months later showed the same ulcerated lesion with the same histological features mentioned earlier. (Figure)
Discussion: EBVMCUs manifest as shallow sharply circumscribed ulcers on the mucosa or skin and are histologically distinguished by the proliferation of variable-sized, atypical B-lymphocytes, making the site of the ulcers in the neo-ileum very atypical and unique. The lesion usually develops in individuals with impaired immunity, such as those who are elderly, have iatrogenic immunosuppression, have primary immune disorders, or are HIV/AIDS-infected. The lack of a tumor mass favors an EBV-positive mucocutaneous ulcer, a newly recognized entity that can involve the GIT and occurs as an age-related disease and in immunosuppressed patients. In contrast to other EBV-related lymphoproliferative disorders, such as EBV-positive diffuse large B-cell lymphoma, EBVMCU has a good prognosis. A watch-and-wait approach or reduction in immunosuppressants are usually sufficient to cause EBVMCU patients to achieve remission.



[2724] **Figure 1.** Neo-ileum biopsy: The atypical cells are large with ovoid to irregular nuclear membrane, hyperchromatic nuclei, variable prominent nucleoli, and cytoplasmic clearing.

S2725

Enteral Nutrition in Crohns Disease With Abscess

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Introduction: Enteral nutrition has emerged as a treatment option for patients with active Crohn's disease. We report a patient achieving remission with enteral nutrition in conjunction with ustekinumab.
Case Description/Methods: A 29-year-old Caucasian male with Crohn's disease not on therapy presented with abdominal pain, nausea and vomiting. In the past 3 years, he had multiple visits to urgent care for symptoms, each treated with systemic steroids. On presentation, he had an elevated CRP of 143.9 mg/L and MR enterography showed inflammation in the small bowel and terminal ileum. The patient completed a 7-day course of piperacillin-tazobactam and was started on ustekinumab. He was readmitted 10 days later with WBC of 16.9 10*3/ul, CRP of 305.6 mg/L, tachycardia, night sweats and worsening abdominal pain. Imaging showed continued inflammation of small bowel and terminal ileum with a mesenteric abscess connected to the D4 portion of duodenum by a fistulous tract. Piperacillin-tazobactam was started for 14 days along with 5 weeks of exclusive enteral nutrition (EEN) with BOOST, ~2145 kcals daily. Repeat imaging showed interval decrease in abscess size and then complete resolution. Disease remission was obtained with alleviation of abdominal pain and weight gain of 5 lbs. Labs normalized with CRP $<$ 3 mg/L, at the end of the 5 weeks of EEN.
Discussion: EEN is the administration of a polymeric formula as the sole source of nutrition for a limited period (4-8 weeks). In Crohn's disease, EEN has been shown to help reach remission in 85-90% of patients. It has special consideration in achieving remission in CD patients who have steroid intolerance or contraindications to systemic steroids. The mechanism of EEN in treatment of Crohns disease is not completely understood but is hypothesized to be multifactorial and potentially involve alterations in gut microbiota, decreasing gut permeability, and allowing restoration of epithelial barrier. Limited studies have been conducted on concomitant use of EEN with biologic agents. These studies have primarily been done looking at anti-TNF agents, such as infliximab, and sustained remission rates. Induction therapy with such agents as ustekinumab take time to have clinical effect, 56% of patients have response in 6 weeks. In this patient, initiation of ustekinumab along with EEN was successful in achievement of clinical remission and reduction in inflammatory markers.

S2726

Five Crohn's Disease Patients Treated With Vedolizumab for Pyoderma Gangrenosum

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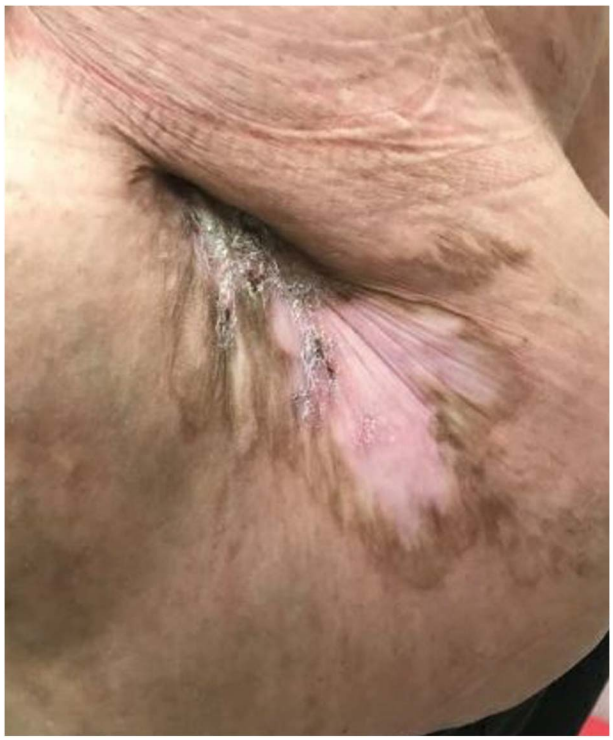
Introduction: Management of pyoderma gangrenosum (PG) is complex due to limited data from extensive studies to guide treatment options. Vedolizumab (VDZ) is a promising new biologic that has shown benefit in treating PG based on case reports. We performed a retrospective chart review to investigate the role of VDZ for the treatment of Ulcerative Colitis (UC) or Crohn's Disease (CD) associated PG.
Case Description/Methods: Using the McKesson billing database, we identified patients with UC or CD-associated PG treated with VDZ between January 1, 2016, and December 31, 2019, at Baystate Medical Center, a 715-bed teaching hospital in western Massachusetts. Sixty-two charts came up in the search and were reviewed manually. Five met our inclusion criteria, and a chart review of these patients' clinical histories was performed with patient characteristics recorded in Table. Case #1 was a 38-year-old woman with colonic CD diagnosed at age 30, status post subtotal colectomy with end ileostomy, complicated by arthralgias and severe PG of her face, legs, and peristoma, who was followed for CD and recurrent PG. She was steroid dependent for nearly the entire duration of her disease, unable to wean below 20 mg daily prednisone without her PG flaring. Adalimumab, infliximab, sulfasalazine failed to control her PG. She was started on VDZ, and after her fourth induction dose, her PG lesions were in complete resolution / remission. After three months of maintenance infusions, she was tapered to 5 mg daily prednisone. Three years later, her PG remains in remission with VDZ (Figure). Case #5 was a 47-year-old man with colonic CD, diagnosed at age 30, complicated by anorectal stricture and fistulization, status post multiple seton placements and left hemicolectomy with Colo vesical fistula repair and a right transverse colostomy, who had peristomal PG that did not improve with adalimumab for eight months and mesalamine. He was started on VDZ, and at his four-month follow-up, he reported complete resolution of his peristomal PG. He has remained on VDZ therapy for the last five years with no recurrence of PG reported.
Discussion: In conclusion, 2 out of 5 of our CD patients with PG responded favorably to VDZ. Our case series suggests that VDZ can be an effective treatment for refractory PG in CD patients; however, given the paucity of data, larger studies are needed.



[2726] **Figure 1.** Case 1's peristomal pyoderma gangrenosum in remission after approximately one year of vedolizumab therapy.

Table 1. Patient characteristics

	Case #1	Case #2	Case #3	Case #4	Case #5
Age	38	65	33	44	47
Sex	Female	Male	Female	Female	Male
BMI	49.8	36.1	27.8	34.9	24.4
IBD type	CD	CD	CD	CD	CD
Montreal Classification	A2 L2 B3	A2 L2 B2	A2 L2 B3p	A2 L3 B3p	A2 L2 B3p
Duration of IBD	8 years	Unknown	10 years	26 years	17 years
Associated medical conditions	Morbid obesity, obstructive sleep apnea, iron deficiency anemia, thyroid nodule	Varicose veins	Depression, hypertension, hyperilpidemia, psoriasis, irritable bowel syndrome	Type 2 diabetes	Insomnia, alcohol use
Other extra intestinal manifestations	Arthralgias	None	Arthralgias	None	None
PG site(s)	Face, peristomal, legs	Peristomal	Legs	Breasts, perineum, labia	Peristomal
Failed biologic therapy	Adalimumab, infliximab	Adalimumab	Infliximab, adalimumab, ustekinumab, certolizumab pegol	Adalimumab, infliximab, certolizumab pegol	Infliximab, adalimumab
PG response to VDZ	Improved	Not improved	Not improved	Not improved	Improved

S2727

Favorable Colitis Outcome After Combination Therapy With Gut Selective Anti-Integrin and Fecal Microbiota Transplantation for Immune Checkpoint Inhibitor Diarrhea and Colitis

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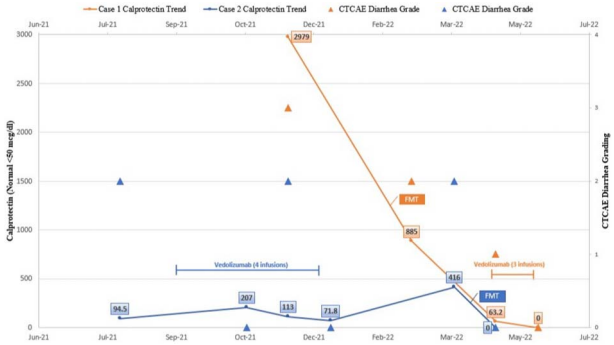
Introduction: Immune-checkpoint inhibitor (IMC) diarrhea/colitis, is the most common immune-related adverse events (irAEs) often leading to delay/ interruption in cancer care. Initial work-up includes ruling out infectious etiology of diarrhea/colitis. Medical therapy of IMC is limited to immunosuppressant therapy. Anti-integrin therapy, namely vedolizumab selectively inhibits the influx of inflammatory cells into the bowel and bears a favorable safety profile in cancer patients. Additionally, the composition of gut commensal bacteria is associated with both response to immune checkpoint inhibitor (ICI) therapy and IMC severity. Fecal microbiota transplant (FMT) has demonstrated utility in management of recurrent Clostridium difficile infection as well as IMC patients. We present a case series of two patients with advanced malignancies who developed IMC and were successfully treated with anti-integrin therapy and FMT.
Case Description/Methods: Case 1: A 64-year-old Caucasian woman with metastatic cervical cancer on pembrolizumab developed Common Terminology Criteria for Adverse Events (CTCAE) grade 3 diarrhea. Infectious work-up was positive for C. difficile. Colonoscopy demonstrated moderate pancolitis with biopsies showing chronic active colitis. She underwent FMT followed by vedolizumab therapy and is currently in clinical remission. Case 2: A 77-year-old Caucasian woman with metastatic urothelial cancer on pembrolizumab presented with grade 2 diarrhea. Infectious work-up was negative. Endoscopic evaluation was notable for normal-appearing small and large bowel mucosa with histology demonstrating lymphocytic colitis. She received vedolizumab followed by FMT and remains in clinical remission. (Figure) (Table)
Discussion: The microbial composition within the GI tract should be at the forefront of considerations in management of ICI colitis. Fecal microbiota transplant for the treatment of IMC represents a novel approach to manipulate the gut microbiome of IMC patients and confer clinical benefit. Vedolizumab is an anti-integrin α4β7 antibody with gut-specific immunosuppressive effects that has demonstrated success in the management of IMC without interfering with ICI therapy. Studies looking into the synergistic effect of gut selective immunosuppression with therapeutic manipulation of the gut microbiome need to be considered.



[2727] **Figure 1.** Trend of CTCAE Grade of Diarrhea and Fecal Calprotectin with Combination Therapy.

Table 1. Clinical Features and Findings

	Case 1	Case 2
Age (Years)	64	77
Gender	Female	Female
Cancer Type	Gyn (stage IV)	GU (stage IV)
ICI Type	Anti-PD-1	Anti-PD-1
ICI Infusions	6	9
CTCAE grade (diarrhea)	Grade 3	Grade 2
GI panel	C. difficile DNT positive, toxin negative	Negative
Stool inflammatory biomarkers	Lactoferrin Positive Calprotectin *2979	Lactoferrin Positive Calprotectin *416

Table 1. (*continued*)

	Case 1	Case 2
Endoscopy	Mayo score 2 pancolitis	Normal colonic mucosa
Histology	Chronic active colitis	Lymphocytic colitis
Management	FMT followed by Vedolizumab	Vedolizumab followed by FMT
Colitis status	Remission	Remission
Cancer status	Stable disease	Remission

Abbreviations: CTCAE, Common Terminology Criteria for Adverse Events; DNA, Deoxyribonucleic acid; FMT, Fecal Microbiota Transplantation; GI, Gastrointestinal; GU, Genitourinary; Gyn, Gynecologic; ICI, immune-checkpoint inhibitor; PD1, Programmed death protein 1. * Indicates calprotectin level prior to FMT.

S2728

From Shortness of Breath to Bowel Unrest: COVID-19-Induced Ulcerative Colitis

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Introduction: COVID-19 is recognized for its respiratory complications, but it can also cause extrapulmonary manifestations such as gastrointestinal complaints. Usually, GI manifestations are transient and rarely progress to chronic disease. We highlight a rare case of newly diagnosed ulcerative colitis triggered by COVID-19 infection.
Case Description/Methods: A 49-year-old female with history of GERD presented with bloody diarrhea and abdominal pain that persisted six weeks after recent COVID-19 infection with otherwise complete resolution of other disease related symptoms. CT abdomen/pelvis showed colonic wall thickening from the hepatic flexure to the rectum concerning for colitis. Labs were significant for leukocytosis 13,600/microliter with elevated CRP 39.1 mg/L. Infectious workup and celiac panel were negative. Colonoscopy was performed and revealed pancolitis with pathology showing architectural distortion with crypt abscesses and chronic inflammatory cells in lamina propria. She was started on a steroid taper with rapid resolution of symptoms for presumed COVID-induced colitis. Unfortunately, upon completion of the taper, her symptoms recurred. Repeat labs showed CRP 8.7 mg/L with imaging negative for colitis. Repeat colonoscopy showed pseudopolyps at the hepatic flexure with segmental biopsies showing moderately active chronic colitis in the right colon. Patient was ultimately diagnosed with ulcerative colitis triggered by COVID-19 infection. She was started on Mesalamine with Prednisone induction eventually requiring Ustekinumab for disease control.
Discussion: Incidence of gastrointestinal manifestations in COVID-19 are variable ranging anywhere from 3-50% of cases. However, COVID-19 induced inflammatory bowel disease is exceedingly rare with only a handful of case reports documenting such occurrence. While not completely understood, the pathophysiology behind COVID-19 related gastrointestinal manifestations likely involves binding of ACE-2 receptors along the epithelium, disrupting the gut barrier. In most patients this disruption is self-resolving; however, patients who develop inflammatory bowel disease likely have underlying genetic predisposition that results in chronic intestinal inflammation. Our case demonstrates the importance of recognizing the extrapulmonary manifestations of COVID-19 which can have life altering implications as seen in our patient.

S2729

Failed Tofacitinib Rescue Therapy in Acute Severe Ulcerative Colitis Refractory to Steroids and Anti-TNF Therapy

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Introduction: Acute severe ulcerative colitis (ASUC) is a life-threatening condition that may lead to complications such as toxic megacolon, infection, perforation, or hemorrhage. Current medical therapy has a high failure rate with approximately a third of patients requiring colectomy.
Case Description/Methods: A 60-year-old Indian man with a three-year history of ulcerative proctitis on mesalamine therapy was admitted to the hospital for diarrhea, abdominal pain, and hematochezia after failing outpatient oral prednisone and rectal budesonide foam. His vital signs on admission were normal. Labs showed WBC of 12.5, Hgb of 10.6, platelet count of 530, albumin of 2.7, CRP of 143.2, ESR of 75, and fecal calprotectin of 1860. C. difficile testing was negative. CT scan showed mild colonic wall thickening. The patient was started on IV methylprednisolone 60 mg/daily. Colonoscopy which showed severe (Mayo Score 3) pancolitis with negative CMV on biopsies. Surgery was consulted after his symptoms did not improve after five days of steroid therapy and he required several blood transfusions. Due to the unavailability of inpatient Infliximab use in our hospital at the time, he was started on Adalimumab and received 160 mg dose, followed by another 160 mg injection in 9 days due to the lack of significant improvement after first dose. The patient refused to undergo colectomy until all medical therapies failed. Given some data on the treatment of ASUC with Tofacitinib, he was started on a 10 mg dose three times daily. CRP declined initially but quickly worsened. Patient decided to transfer care to another tertiary center for colectomy. While awaiting transfer, he developed brisk lower GI bleeding and became hypotensive. He was moved to the ICU and required emergent exploratory laparotomy with colectomy and an end ileostomy, three weeks after his admission to the hospital.
Discussion: Despite recent data demonstrating some efficacy of tofacitinib as a rescue therapy with concomitant IV steroids, our case failed to respond to this treatment. Further delay in surgical intervention likely resulted in the need for emergent surgery. Data to support rescue tofacitinib is based on observational and retrospective case-control data with several limitations. Clinicians should be cautious delaying a definitive surgical intervention until more robust data supports tofacitinib rescue therapy for this sick population. Fortunately, this patient had an uncomplicated post-op course and was discharged to rehab in ten days.

S2730

Heart Aches With Mesalamine: A Rare Case of Aminosalicylate-Induced Myopericarditis in a Basic Military Trainee

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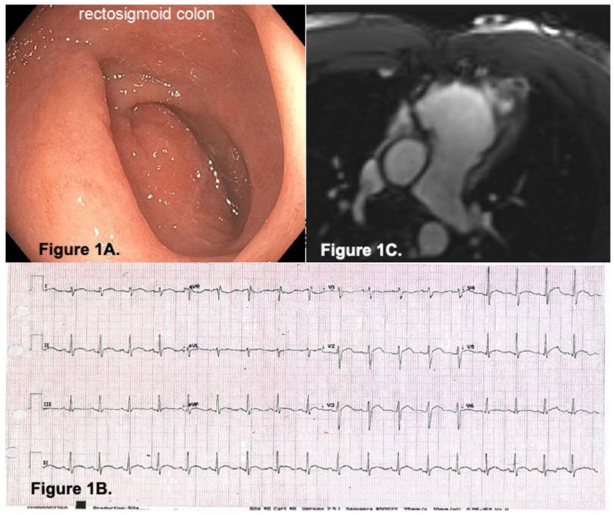
Introduction: Ulcerative Colitis (UC) is a chronic autoimmune condition predominately manifesting as colonic inflammation with serious morbidity. Early intervention with medical therapies can alter the disease course, improving symptoms and reducing the need for hospitalization and surgery. While patients and providers are increasingly focused on the use and side effects of biologic therapies, older medications such as mesalamine (5-ASA) are still commonly prescribed and can cause idiosyncratic reactions. We present a case of 5-ASA induced myopericarditis to highlight this rare, life threatening complication.
Case Description/Methods: A 28 year old male basic military trainee was referred for evaluation of iron deficiency anemia. Patient reported chronic 2-4 bowel movements daily and hematochezia with wiping. Physical exam was unremarkable. Labs revealed hemoglobin of 11.6g/dL, iron saturation 15% and ferritin 16ng/mL. The patient underwent colonoscopy, which demonstrated features consistent with Mayo 2 UC extending from the anus to 30cm (Figure), with biopsies confirming chronic active proctitis and colitis. Patient was started on oral 5-ASA for mildly active left sided UC with good clinical response. Three weeks after starting treatment, patient presented to the Emergency Department with pleuritic chest pain, worse with exertion. Electrocardiogram (EKG) showed diffusely elevated T waves. Labs revealed a troponin of 0.03ng/mL and proBrain natriuretic peptide of 1888pg/mL. Patient was admitted to the hospital and ruled out for alternative infectious and autoimmune etiologies. Cardiac MRI demonstrated diffuse, patchy ventricular enhancement and a reduced left ventricular systolic function. Patient was diagnosed with 5-ASA induced myopericarditis and discharged on colchicine and prednisone with good clinical response.
Discussion: Myopericarditis is a rare, potentially lethal complication of 5-ASA therapy. The pathophysiology of 5-ASA related cardiac manifestations are poorly understood, with reactions typically seen within the first 1-4 weeks of treatment. Diagnosis of 5-ASA pericarditis is clinical without distinguishing features from other causes of pericarditis. Most patients improve dramatically with discontinuation and lifelong avoidance of mesalamine, with the role for steroids and anti-inflammatory therapy somewhat controversial. Our case serves to remind clinicians of this serious side effect and the importance of thorough risk-benefits counseling for any UC treatment.



[2730] **Figure 1.** A; Colonoscopy images showing erythema, vascular drop out, small erosions, and contact friability consistent with Mayo 2 UC. B: EKG demonstrating diffuse T wave elevations consistent with Pericarditis. C: Cardiac MRI demonstrating diffuse, patchy left ventricular gadolinium enhancement.

S2731

Gastroduodenal Crohn's Disease and the Importance of Concurrent Upper Endoscopy

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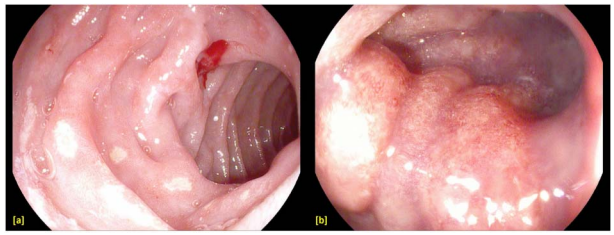
Introduction: Gastroduodenal Crohn's disease (CD) is an unusual phenomenon affecting 0.5-4% of all CD patients. First described by Gottlieb in 1937, the majority of these individuals have concurrent involvement of the colon with isolated gastroduodenal disease accounting for less than 0.07% of all CD patients. Pathology is more obscure in the upper gastrointestinal (GI) tract than with ileocolonic CD and non-caseating granulomas – a hallmark of distal CD – are not necessarily needed for confirmatory diagnosis. Often, only focal gastritis, lymphoid aggregates and other nonspecific inflammatory changes are noted on histopathology. Though many patients are asymptomatic, gastroduodenal involvement highlights a more severe form of CD and thus warrants steroid treatment and biological agents earlier in the disease course.
Case Description/Methods: A healthy 30-year-old male presented with 3 months of hematemesis, watery diarrhea, and abdominal pain for with a 30lb weight loss. He had a leukocytosis of 12,000 with neutrophilic predominance. A colonoscopy showed significant ileocolonic mucosal ulceration throughout the rectum with an inability to traverse the sigmoid due to significant inflammation. Pathology was confirmatory for new onset CD. An esophagogastroduodenoscopy (EGD) showed focal gastritis and shallow ulceration up to the 2nd part of the duodenum with pathology consistent with concurrent gastroduodenal CD. He was discharged on infliximab but returned with a flare due to noncompliance. He was then trialed on an adalimumab-azathioprine regimen with good remission and maintenance response.
Discussion: Current literature is bereft of controlled studies assessing the efficacy of medication for the treatment of CD in the upper GI tract and treatment is therefore based on a combination of distal disease activity and clinical experience. As gastroduodenal CD is usually asymptomatic in adults, often an EGD is not routinely performed. We emphasize the importance of including routine upper endoscopy in the diagnostic evaluation of ileocolonic CD patients to investigate the presence, distribution, and severity of gastroduodenal involvement. Furthermore, the frequent obscurity in identifying gastroduodenal CD on endoscopy and pathology encourages the integration and amalgamation of clinical, endoscopic, histological, and radiological findings along with practitioners' clinical experience and gestalt in order to establish a confirmatory diagnosis of this disease.



[2731] **Figure 1.** [a] View of proximal duodenum via upper endoscopy showing multiple non-bleeding, round, clean based and shallow ulcers ranging between 3-7mm [b] View of sigmoid colon via colonoscopy showing extensive ulceration and friability.

S2732

IgA Nephropathy and Crohn's Disease: Chicken or the Egg?

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Introduction: Crohn's disease (CD) is often associated with extra-intestinal manifestations. Common renal complications include nephrolithiasis and tubulointerstitial disease. Renal parenchymal disease is less common, and immune-complex glomerulonephritis is rarely reported in literature. CD usually precedes the nephropathy. We present two patients with CD and IgA nephropathy.
Case Description/Methods: Case 1: A 29 year old male presented with hematuria and acute renal failure at age 16. He was diagnosed with IgA nephropathy by renal biopsy and treated with steroids. Ten years later, he developed a perirectal abscess, was diagnosed with Crohn's ileocolitis and started Infliximab infusions. Both the IgA nephropathy and CD remained stable. Case 2: A 29-year-old male with a known history of Crohn's ileocolitis, on infliximab, developed facial swelling and severe hypertension. Labs: BUN 86 mg/dL and creatinine 3.86 mg/dL. Renal biopsy revealed IgA nephropathy. Infliximab was discontinued and he was started on Cyclophosphamide by nephrology. His renal function worsened, and he started hemodialysis. He is being evaluated for a kidney transplant and CD remains in remission.
Discussion: The pathophysiology of IgA nephropathy remains unclear. A number of mechanisms have been postulated. Kett et al showed an increase in IgA1 producing cells in the colonic tissue of patients with IBD, suggesting that abnormal helper T cells stimulate plasma cells in the bone marrow to secrete polymeric IgA. It is hypothesized that these intestine derived IgA complexes are deposited in glomerular mesangial cells producing IgA nephropathy. Case 1 is unusual in that the nephropathy preceded CD by many years, calling into question this hypothesis. Genetic factors may play a role, HLA-DR1 maybe a potential link between the two diseases. Environmental factors have been considered as well. M edian age of onset for IgA nephropathy is 22 yrs, with a range of 10-36y yrs. Symptoms can range from gross

hematuria, hypertension, and edema to acute renal failure. It appears that successful treatment of IBD with medications or resection is associated with clinical remission of IgA nephropathy, as seen in case 1 and that IBD associated nephropathy is associated with a worse prognosis as seen in case 2. It is important to consider IgA nephropathy as a differential diagnosis in patients who present with signs of renal impairment in order to prevent adverse outcomes.

S2733

How to Manage Silent Inflammatory Bowel Disease

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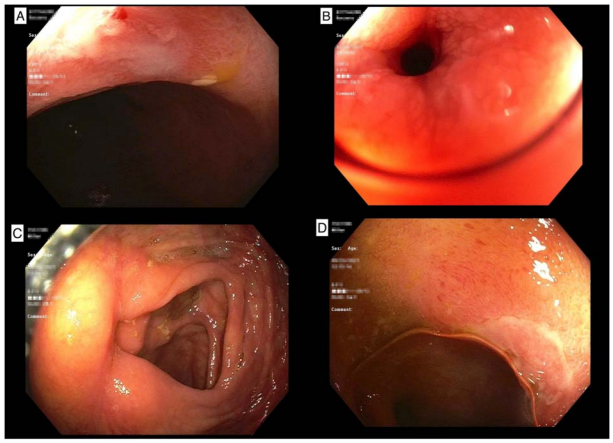
Introduction: The incidence and prevalence of inflammatory bowel diseases (IBD), Ulcerative Colitis (UC) and Crohn's Disease (CD), are increasing worldwide. The pathogenesis of IBD is multifactorial and the disease has a pre-clinical stage where inflammation and damage progress to develop intestinal symptoms. However, some patients in the pre-clinical stage of IBD may be identified on screening modalities. This finding often poses a dilemma as asymptomatic patients may not be willing to initiate medical treatment. Here we describe two cases of pre-clinical IBD found on screening colonoscopy.
Case Description/Methods: Patient 1 is an asymptomatic 47-year-old female without significant past medical history who presented for screening colonoscopy. Colonoscopy revealed ileocecal valve stenosis with inflammation that prevented intubation beyond the valve but tissue sample of the ileum was obtained (Figure A-B). Biopsies revealed focal active ileitis with mild glandular distortion and rare pseudopyloric glandular distortion. Magnetic resonance elastography (MRE) showed findings of the terminal ileum with marked bowel wall thickening, luminal narrowing, upstream dilatation suggestive of stricture and penetrating disease with enteroenteric and enterocolonic fistulas. Patient was classified A3/L3/B3. Patient 2 is an asymptomatic 51-year-old female with a past medical history of gastroesophageal reflux disease and anxiety who presented for screening colonoscopy. Colonoscopy was noted to have a patchy, erythematous and ulcerated ileum, and distorted IC valve (Figure C-D). Biopsies revealed severe active ileitis with ulceration. Patient subsequently underwent further workup revealing positive anti-Saccharomyces cerevisiae antibodies (ASCA). Patient was classified as A3/L1/B1.
Discussion: Identifying pre-clinical IBD on screening modalities should not dissuade a clinician from appropriately managing moderate to severe cases of IBD. It may be difficult to decide who to treat because such patients are asymptomatic, but persistent inflammation has been shown to be associated with higher rates of hospitalization, surgery, or new abscesses or fistulas. Clinicians can follow up with lower risk patients to monitor symptoms like patient 2, but asymptomatic fistulizing disease and stenoses are high risk like seen in patient 1. Awareness of pre-clinical IBD is important and further discussions about screening and management are warranted.



[2733] **Figure 1.** Screening Colonoscopy of Patients A – Patient 1 Ileocecal valve B – Patient 1 Stenosed Ileocecal valve unable to be traversed C – Patient 2 Normal appearing ileocecal valve D – Patient 2 Terminal ileum ulcer.

S2734

Hodgkin's Lymphoma in a Patient With Ulcerative Colitis: Case Presentation

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Introduction: Ulcerative colitis (UC) is a chronic inflammatory condition characterized by relapsing and remitting episodes of inflammation limited to the colon's mucosal layer. Hodgkin lymphomas (HL) are lymphoid neoplasms of malignant cells admixed with a heterogeneous population of non-neoplastic inflammatory cells. Patients with autoimmune disorders are at increased risk for developing HL. Still, it is unclear if this is directly related to these conditions or to the immunosuppressive agents used to treat them.
Case Description/Methods: The case is a 36-year-old male patient diagnosed with UC in 2013 that was treated for four years with Humira and Prednisone with multiple episodes of relapsing. The patient presented numerous disease complications during this period, such as iron deficiency anemia. In January 2017, a follow-up colonoscopy reported pseudo polyps within the distal transverse colon and descending colon with active colitis in the sigmoid and rectum, with evidence of severe active colitis with some mass-like nodules. Due to these findings, the patient was evaluated for proctocolectomy, and plans were made for elective surgery. Before going for proctocolectomy, the patient received a diagnosis of lymphoma. In March 2017, the patient presented in the hospital with a history of more than one month of fever and generalized lymphadenopathies. After the lymph node biopsy, the patient was diagnosed with Hodgkin's lymphoma III B. The patient was treated for HL with 12 cycles of combined chemotherapy (ABVD), tolerated the treatment, and achieved stable remission of HL and UC. He continues in remission after five years of follow-up. The last visit was in March 2022.
Discussion: The resolution of the UC during the treatment for HL results in an interesting benefit that doesn't justify the chemotherapy for UC. Still, it is similar to the other few occasional cases in the literature.

S2735

Induction of Inflammatory Bowel Disease by Interleukin-17 Inhibitor

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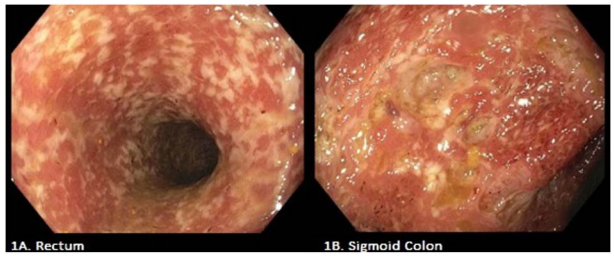
Introduction: Ixekizumab is a monoclonal antibody targeting interleukin-17 (IL-17) approved for treating psoriasis. We report a case with rare gastrointestinal (GI) manifestation with ixekizumab use.
Case Description/Methods: A 40-year-old male with psoriasis presented with 4 weeks of abdominal pain and intermittent watery diarrhea with blood & mucous. He was febrile to 102 °F with other vitals unremarkable. Physical exam revealed psoriatic plaques, generalized abdominal tenderness, & bilateral knee stiffness. Patient's medications included topical betamethasone-calcipotriene, methotrexate weekly, folic acid, golimumab monthly, and piroxicam. Two months prior, he began taking ixekizumab for worsening psoriasis. Psoriatic lesions and arthropathy improved. However, hematochezia started one month after using ixekizumab. Work up revealed WBC 15.1k/mm3, CRP 174.4 mg/L, and ESR 76 mm/hr. CT abdomen and pelvis with IV and oral contrast demonstrated diffuse circumferential long segment wall thickening of the distal colon and rectum with mucosal enhancement. Patient continued to report daily hematochezia. Colonoscopy demonstrated a contiguous area of bleeding ulcerated mucosa in his rectum, sigmoid colon, descending colon and splenic flexure (Figure). Biopsies demonstrated crypt architecture abnormalities including bifurcation of crypts, prominent chronic inflammation consisting of lymphocytes, plasma cells, and eosinophils with mucosal ulcerations and crypt abscess formation. No granulomas were noted. Stains for HSV & CMV, and GI pathogen panel were negative. This patient's clinical findings

were most consistent with ulcerative colitis (UC). Ixekizumab was discontinued. Hydrocortisone and mesalamine were started. Shortly thereafter all GI symptoms completely resolved and patient was discharged home.

Discussion: Here we present a patient with history of psoriasis, who developed severe UC in the context of recent IL-17 inhibitor use. Clinical trials investigating IL-17 inhibition in inflammatory bowel disease (IBD) suggest that it may cause worsening or relapse in symptoms. We present a unique case of ixekizumab causing new-onset UC. This patient had no family history of IBD, no smoking history, & no extra-intestinal manifestations suggestive of UC. Only after introduction of ixekizumab he developed symptoms and pathology related to UC. This case describes rare GI manifestations of ixekizumab and other IL-17 inhibitors. It reminds us to be cognizant and monitor for IBD symptoms in patients taking such medications.



[2735] **Figure 1.** Colonoscopy demonstrated a contiguous area of bleeding ulcerated mucosa in the rectum (1A) and sigmoid colon (1B).

S2736

Insulin-Like Growth Factor I Receptor Inhibitor-Induced Inflammatory Bowel Disease

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Introduction: Graves' orbitopathy is an autoimmune disease that develops in approximately 40% of patients with Graves' disease. Insulin-like growth factor I receptor (IGF-IR) is overexpressed in this disease and plays a central role in this ophthalmopathy. Teprotumumab is a monoclonal antibody against IGF-IR used for active Graves' orbitopathy. We report a patient who presented with rectal bleeding and was found to have a reoccurrence of inflammatory bowel disease (IBD) thought to be secondary to recent teprotumumab therapy.

Case Description/Methods: A 46-year-old female with a diagnosis of Crohn's disease, off of therapy for 4 years with endoscopic and histological remission, history of pyoderma gangrenosum, psoriasis, vitiligo, and Graves' orbitopathy presented to the emergency department for rectal bleeding. On review, the patient had finished teprotumumab infusions 17 days prior to presentation. Following each infusion, she would experience 2 days of self-resolving rectal bleeding. After her last infusion, the bleeding persisted for more than a week leading her to seek medical care. Labs were significant for hemoglobin 11.4, CRP 0.4, and ESR 28. Colonoscopy revealed continuous severe inflammation extending from the dentate line up to the sigmoid colon as well as the presence of a cecal patch. Biopsies showed active proctocolitis with cryptitis, crypt abscesses and lymphoplasmacytosis. Patient was started on solumedrol 20 mg IV every 8 hours. Her symptoms resolved with the IV solumedrol and she was discharged home on a course of oral corticosteroids.

Discussion: IGF-1 induces proliferation of regulatory T cells and pauses progression of autoimmune disease in the bowel. Animal models have suggested that IGF-1 is involved in mucosal repair and has an anti-apoptotic function in gut mucosa. Patients with active IBD have reduced levels of IGF-1. Therefore, it could be inferred that the use of teprotumumab, a medication whose method of action is to inhibit this growth factor receptor, may exacerbate or illicit IBD. The drug prescribing information does caution that teprotumumab can trigger exacerbation of the underlying IBD and recommends close monitoring of IBD patients. This case highlights a potentially detrimental side effect and appropriate discussions with patients should be held prior to this medications usage. Ideally the gastroenterologist should be kept abreast of the decision to initiate such therapy to allow for careful monitoring.

S2737

Is It Inflammatory Bowel Disease or Something Else?

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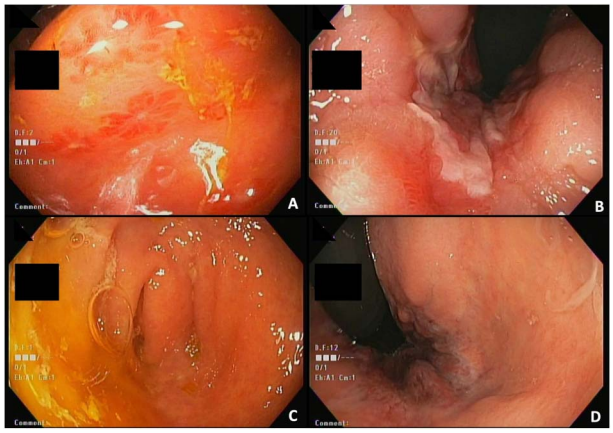
Introduction: Gastrointestinal manifestations of sexually transmitted infections (STI) are not readily recognized, and the diagnosis of STIs is often delayed due to the overlapping symptomology with inflammatory bowel disease (IBD). For this reason, a thorough sexual history is highly recommended when encountering patients with risk factors who present with anorectal symptoms.

Case Description/Methods: A 36-year-old male with a history of HIV on HAART presented to his primary care physician with bright red blood per rectum. He reported tenesmus, rectal pain, and bleeding with the passing of bowel movements. He denied significant weight loss, changes in bowel habits, melena, abdominal pain, dyspepsia, or any other constitutional complaints. His father was diagnosed with anal cancer in his late 40s and his maternal grandmother was diagnosed with colon cancer in her late 70s. The patient underwent a colonoscopy which showed superficial ulcers and erosion in the cecum, normal terminal ileum, and a 2-cm rectal ulcer. Biopsies of the affected areas revealed chronic active colitis, with lymphoid aggregates without cryptitis, crypt abscess, granulomas, or dysplasia. The patient was started on azathioprine by his gastroenterologist for presumed IBD. Incidentally, his rectal chlamydia swab was positive after his partner was diagnosed with genitourinary C. trachomatis. He was then treated with azithromycin his azathioprine was discontinued. A repeat colonoscopy showed no evidence of colitis or rectal ulcers.

Discussion: STI can cause proctocolitis and in particular chlamydial proctitis can present similarly to IBD clinically, endoscopically, and histologically. Physicians should obtain a sexual history for high-risk patients who present with anorectal symptoms especially before patients are treated with immunomodulator/biologic agents for presumed IBD. A high index of suspicion and risk stratification can prevent delays in care and provide cost-effective care.



[2737] **Figure 1.** A: Initial colonoscopy showing superficial ulcers and erosions in cecum. B: Initial colonoscopy showing 2cm rectal ulcer. C: Repeat colonoscopy without evidence of colitis. D: Repeat colonoscopy healed rectal ulcer.

S2738

Isolated Celiac Artery Vasculitis Presenting as Ileus in a Patient With Ulcerative Colitis

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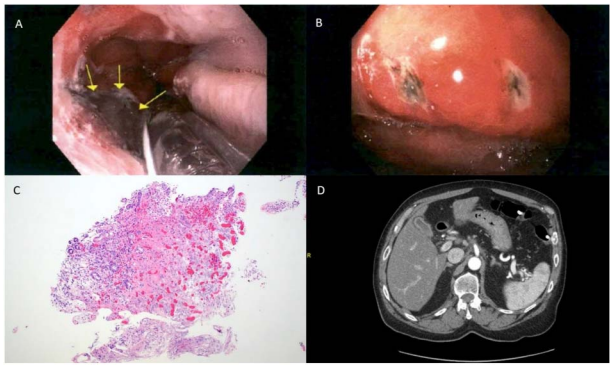
Introduction: Small case series have reported an association between IBD and large vessel vasculitides, ANCA-associated vasculitis, and cutaneous vasculitis. Gastrointestinal (GI) involvement of vasculitis can be a severe complication, resulting in mesenteric ischemia, ileus, or GI bleeding, and often requires aggressive medical or surgical interventions. We report a case of celiac artery vasculitis presenting as abdominal pain and ileus in a patient with ulcerative colitis (UC).
Case Description/Methods: A 69 year old male with an 11 year history of UC in remission on infliximab and azathioprine (AZA) presented to the emergency room with abdominal pain and constipation for five days. He had decreased AZA from 200 mg to 100 mg one month prior. Initial CT abdomen and pelvis showed stranding surrounding the celiac artery, fluid-filled small bowel loops, and segmental areas of distal colon collapse with proximal colon distention. He developed progressive small bowel and colonic distention with cecum diameter of 10 cm. A colonoscopy was performed for decompression. He had no evidence of active UC. EGD demonstrated dusky appearing gastroesophageal junction and inflammation with cratered ulcers in the gastric cardia and body. Biopsies confirmed ischemic necrosis. CTA demonstrated perivascular inflammation of a patent celiac artery without evidence for dissection, suggestive of acute vasculitis. ESR and CRP were 50 mm/hr and 7.8 mg/dL respectively. Myeloperoxidase, serine-proteinase 3, rheumatoid factor, ANA, were negative. He was started on methylprednisolone IV with oral prednisone taper at discharge, and AZA was increased to 200 mg daily. A CT one month later showed minimal residual inflammation. ESR and CRP had normalized. (Figure)
Discussion: We present the first case of isolated celiac artery vasculitis in a patient with IBD. A diagnosis of IBD often precedes vasculitis, and patients are typically on immunosuppressive therapy at the time of onset. Anti-TNF agents have been implicated as a potential inciting cause. Although it is unclear whether long-term anti-TNF therapy precipitated vasculitis in our patient, the dose reduction in AZA prior to presentation may have unmasked vasculitis. This was supported by his rapid clinical and radiographic improvement with combination of steroids and increased AZA dose despite continuation of infliximab. This case highlights the importance of maintaining a high degree of suspicion for vasculitis in patients with IBD on immunosuppressive therapy presenting with ischemia or ileus.



[2738] **Figure 1.** A 69 year old male underwent EGD for evaluation of abdominal pain and NG tube placement; he was found to have inflammation with a dusky appearing mucosa at the gastroesophageal junction (GEJ) (A). Non-bleeding gastric ulcers with overlying pigment (Forrest Class IIc) were identified (B). H&E stain image shows the GEJ biopsy with extensive ischemic necrosis and hemorrhage (C). Initial CTA abdomen/pelvis shows fat stranding surrounding the celiac artery (D).

S2739

Incidental Finding of Intestinal Spirochetosis in a Patient With Inflammatory Bowel Disease

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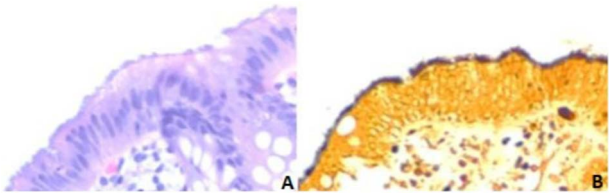
Introduction: Intestinal spirochetosis (IS) is an infection most commonly caused by Brachyspira aalborgi, a gram-negative spirochete. Early on, IS was thought to be most commonly associated with HIV infection, but recent studies have shown a link to patients with a wide variety of risk factors, including IBD. We present a case of an IBD patient with incidental ly intestinal spirochetosis identified on colonic biopsy.
Case Description/Methods: A 40-year-old female with a history of stricturing ileocolonic Crohn's disease was seen in gastroenterology clinic for follow-up. She was diagnosed with Crohn's disease in 2019, initially treated with adalimumab; however, due to antibody formation, she was transitioned to ustekinumab. She reported 1 to 2 formed bowel movements daily and no other significant symptoms such as abdominal pain, nausea, rashes, sores, or weight loss. She underwent colonoscopy for disease monitoring, which revealed normal colon, ileal stricture and 1 small ileal erosion but otherwise no signs of active disease. Incidentally, her pathology revealed intestinal spirochetes. Of note, the patient used to work as a veterinarian and has a dog at home.

Discussion: IS is typically asymptomatic but may present with chronic, watery diarrhea or vague abdominal pain. Diagnosis is made incidentally on histology of colonic mucosal biopsies. Some reports have described polypoid and erythematous lesions associated with IS, but they are typically not easily identifiable. Histologically, silver stains or immunostains for Treponema pallidum may be necessary to identify these organisms . A hallmark of IS is the "false brush border" formed by a band of spirochetes adhering to the epithelial layer . Originally, IS was mainly found in areas of low socioeconomic status in veterinary medicine. Human colonization has been observed more recently predominantly in HIV and homosexual male populations. IBD patients are at a higher risk of infection due to immunocompromised status. Asymptomatic patients do not require treatment. However, for those requiring treatment, a trial of metronidazole can be use. One case report documented IS in an IBD patient with symptoms of abdominal pain and watery diarrhea that was successfully treated with metronidazole leading to complete resolution of symptoms. (Figure) This case highlights a rare etiology of chronic diarrhea that should be considered, especially in immunocompromised patients with no other clear cause of symptoms.



[2739] **Figure 1.** A – Attached to the luminal border are fuzzy basophilic structures, recall that colonic mucosa does not have a microvillus border, and even if it did, this is too thick (hematoxylin and eosin 40X). B – The organisms are positive on silver based stains.

S2740

Incidentally Discovered Cryptogenic Cirrhosis in a Patient With Untreated Celiac Disease

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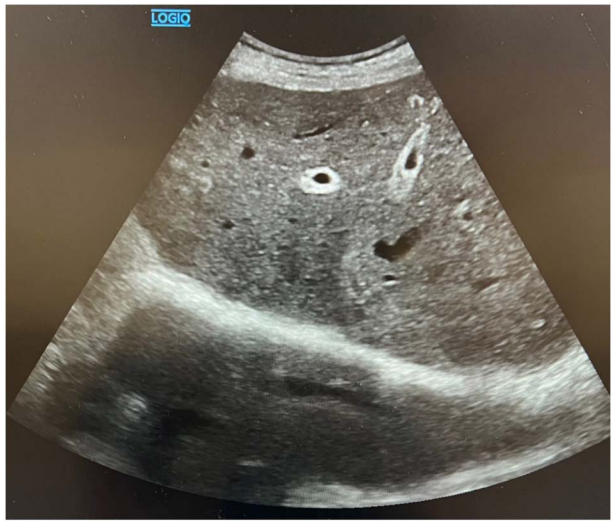
Introduction: Celiac disease is an autoimmune enteropathy that affects around 1% of the general population and primarily manifests its effects on the small bowel. However, the systemic nature of this condition, especially regarding the liver, has been gaining some recognition in the literature. Mild liver disease is common, but few cases progress to cirrhotic liver disease. In this case report, cryptogenic cirrhosis was incidentally discovered in a patient with a long history of untreated celiac disease with no evidence of any other underlying cause for the cirrhosis.
Case Description/Methods: A 78-year-old male with past medical history of longstanding celiac disease, atrial fibrillation, CHF, T2DM, CKD III, and thoracic aortic aneurysm underwent a CT scan for thoracic aortic aneurysm surveillance. Incidentally, on CT scan, a 1.2 cm enhancing focus in left hepatic lobe, cirrhotic liver morphology, and sclerosing mesenteritis were discovered. Initial lab work-up was remarkable for an elevated alkaline phosphatase of 171 and initial tissue transglutaminase (TTG) was >100. Confirmatory ultrasound showed a liver with heterogeneous echotexture, 1.2cm cyst on the left hepatic lobe, and patent main portal vein. Further laboratory workup showed negative anti-smooth muscle antibody, negative antimitochondrial antibody, negative liver kidney microsomal antibody, and alpha-fetoprotein < 2. Patient reported a history of constipation but denied any other gastrointestinal symptoms, including abdominal pain, hematochezia, diarrhea, nausea, or vomiting. Patient had a remote history of alcohol use, with only occasional recreational use at presentation. The patient had never followed a gluten-free diet. (Figure)
Discussion: Celiac disease is now thought to be a systemic condition, with up to 30% of patients displaying extraintestinal manifestations. Multiple studies have shown an increased incidence of celiac disease in patients with cirrhosis, and that cessation of gluten can improve not only the small bowel, but also liver function. This suggests that there is utility in monitoring liver function in patients with celiac disease and screening patients with cirrhosis for celiac disease on initial workup. It is also important to inform patients of these connections, as compliance with a gluten-free diet may prevent the progression of the enteropathy and protect its systemic targets.



[2740] **Figure 1.** Sagittal View of Cirrhotic Liver Morphology on Right Upper Quadrant Ultrasound.

S2741

Ischemic Colitis Imitating Inflammatory Bowel Disease

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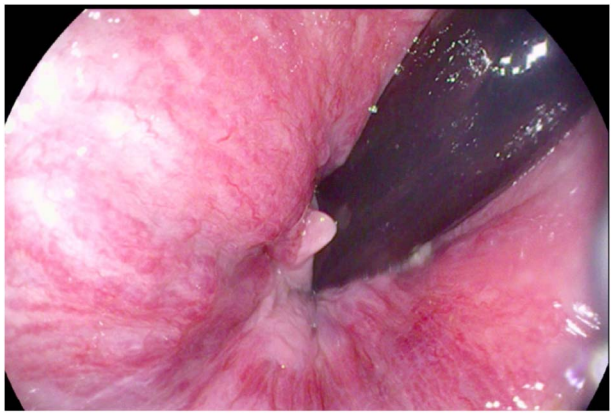
Introduction: Inflammatory bowel disease (IBD) and ischemic colitis (IC) are two different entities that can present similarly. There have been case reports of Crohn's disease mimicking IC in elderly population. In contrast, we present a case of a young patient whose clinical history was consistent with IBD, but he was ultimately found to have IC on biopsy results.
Case Description/Methods: A 36-year-old male with a history of type I diabetes mellitus, hypothyroidism as well as family history significant for IBD presented with abdominal pain, nausea, emesis, and diarrhea. In the emergency room, he was afebrile and hemodynamically stable with BP of 121/88 mmHg and HR of 90 BPM. Labs were significant for mild leukocytosis and normal lipase. Computed tomography of abdomen pelvis with contrast revealed diffuse colonic thickening concerning for acute colitis. C. difficile and gastrointestinal pathogen panel were negative. The day after admission, he was found to have intermittent episode of hematochezia along with elevated fecal calprotectin and c-reactive protein at 2945 ug/g and 38 MG/L respectively. Patient's elevated inflammatory marker in setting of negative

infectious work up, family, and personal history of autoimmune diseases were concerning for IBD. Patient underwent colonoscopy which revealed large ulcerated, edematous, and erythematous area in the mid-distal proximal transverse colon (50-80cm from the anal verge) (Figure) with rest of colonic mucosa and terminal ileum appearing normal. Biopsies from the mid transverse colon showed paucicellular lamina propria with edema, hyalinization, vascular dilation, and congestion consistent with ischemic colitis without any significant crypt architectural distortion, basilar lymphoplasmacytosis or evidence of metaplasia. Precipitant for ischemic colitis was unclear in this patient. He was treated symptomatically for ischemic colitis and had symptomatic improvement at time of discharge.
Discussion: It is essential to consider IC in a young patient with family and personal history of autoimmune disease presenting with signs and symptoms typical for IBD as IC can mimic IBD. Timely and proper diagnosis is necessary as treatment for these two disorders is completely different. IBD can require medications like biologics which may have dangerous side effects if used inappropriately where IC is managed symptomatically.



[2741] **Figure 1.** Colonoscopy showing large edematous and erythematous area in the mid-distal proximal transverse colon.

S2742

Merging the Evidence and the Art: Diagnosing Crohn's Disease From Pyoderma Gangrenosum

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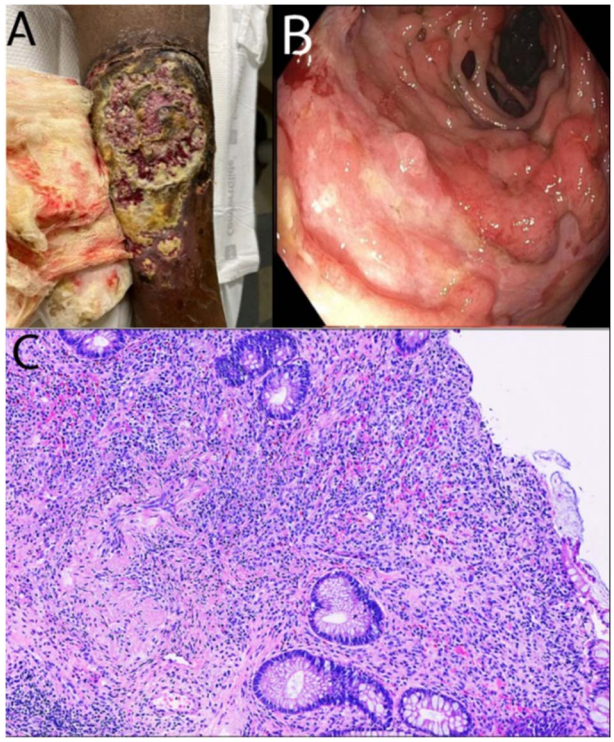
Introduction: The dermatologic exam is essential in evaluating cases of suspected inflammatory bowel disease (IBD). Pyoderma gangrenosum (PG) is a potential cutaneous finding, characterized by dermal neutrophilic inflammation; classically presenting as skin ulceration. When encountered before an established diagnosis of IBD, the finding may be mistaken for other causes of ulceration such as vascular insufficiency, diabetic foot ulcer, cancer etc. We detail an 8th decade patient with no prior history of IBD who presented with a large leg ulcer and new onset bloody stools, later diagnosed with Crohn's disease.
Case Description/Methods: A 73 year old African American male with history of diabetes mellitus and hypertension presented with painful ulcerative leg lesions, noted initially as a "scab" with rapid 2 week progression to that shown (fig 1-A). Additional history was pertinent for intermittent bloody stools of similar duration. He denied past similar symptoms and review of systems was otherwise negative. Serology was notable for severe iron deficiency anemia with hemoglobin of 2.7 g/dl, MCV of 69.2 fL, iron of 16 ug/dL and transferrin saturation of 6%. After 4-units blood transfusion and empiric IV antibiotics, the admitting service requested consults for endoscopic evaluation and skin biopsy. Colonic mucosa was notable for multiple ulcers and skip lesions throughout the colon, sparing the rectum (fig 1-B). Pathology report of colonic biopsy samples noted chronic inflammatory changes consistent with Crohn's colitis (fig 1-C). Peripheral leg lesion biopsy showed perivascular lymphocytic infiltrate. Ultimately patient was discharged with gastroenterology follow-up and scheduled re-biopsy.
Discussion: PG is a rare skin finding which may be seen in IBD. The classic variant displays salient ulceration, often of the lower extremities. This patient was advanced in age, and his only gastrointestinal complaint was that of bloody stools — features for what would be diagnosed as Crohn's. His ulcer may have erroneously been attributed to diabetes or vascular disease and anemia to causes other than IBD. The rapidity of lesion development, well-defined appearance and violaceous borders were consistent with PG. Although histologically defined by neutrophilic infiltration, peripheral biopsy tends to show chronic inflammatory infiltrate with features suggestive of vasculitis as was the case in our patient. Physicians should maintain suspicion for IBD despite few colitis symptoms in patients with ulcerative skin lesions.



[2742] **Figure 1.** (A) left lower extremity demonstrating a large well-circumscribed central ulcerative lesion with violaceous border. Similar but smaller lesions seen inferiorly. (B) Photograph taken during colonoscopy showing mucosal ulceration and inflammation of the ascending colon. (C) (x200) Photomicrograph of hematoxylin and eosin-stained section of the right colonic biopsy, showing inflamed granulation tissue with an ulcerative process, areas of lamina propria fibrosis, granulation tissue, mixed acute and chronic inflammation, and crypt architectural distortion.

S2743

Mesalamine-Induced Interstitial Lung Disease in a Crohn's Patient With COVID-19

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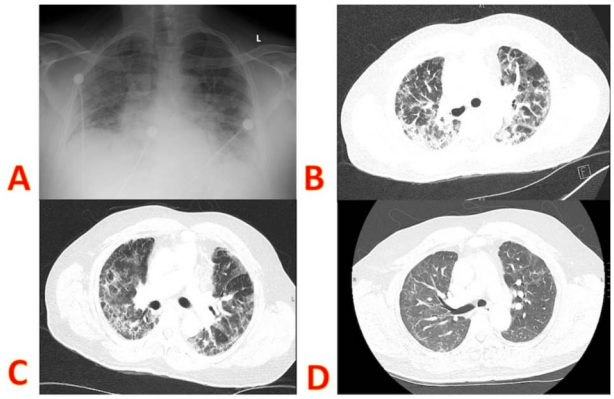
Introduction: Extraintestinal manifestations of Crohn's disease (CD) generally correlate to the disease activity and may be seen in 1 of 4 patients with CD. Though the prevalence of bronchopulmonary manifestations in CD is 0.4%, subclinical pulmonary changes may be seen in up to half of adults with CD, with involvement of the tracheobronchial tree, lung parenchyma or the pleura.
Case Description/Methods: A 61-year-old man, with a history of CD diagnosed 2 years ago, currently in remission with mesalamine, was admitted to the ICU with acute hypoxic respiratory failure due to COVID-19. Inflammatory markers were elevated and he needed high-flow nasal cannula. He was started on a 5-day course of dexamethasone. By HOD-9 O2 requirement and inflammatory markers had trended down. However, around HOD-10 his O2 requirement increased to 6-10 L at rest. CT-chest showed peripherally distributed ground-glass opacities and superimposed early diffuse fibrotic lung changes. Superadded bacterial infection was ruled out. Mesalamine was discontinued and the patient was started on a course of iv methylprednisolone, after which oxygen requirements dramatically declined. He was discharged on HOD 24 with 2L O2 at rest and 4L on ambulation and a prednisone taper. Chest x-ray in 8 weeks showed improving infiltrates. On follow-up 5 months later, he was not on O2 anymore and was doing well.
Discussion: Latent interstitial pulmonary involvement is seen in around 20%-55% of patients with IBD, with the most common manifestation being drug-induced lung disease, due to sulfasalazine, mesalamine, methotrexate, or anti-TNF agents. Pulmonary function tests can help in early identification of lung injury since respiratory involvement is latent many times. Onset of drug reaction can occur from 5 days to 44 months after initiation of mesalamine therapy and has been reported in the form of eosinophilic pneumonia, organizing pneumonia, nonspecific interstitial pneumonia and hypersensitivity pneumonitis. The absence of other extra-intestinal manifestations, and the remission of CD itself, can be helpful in excluding other pulmonary manifestations of CD from drug-induced lung disease. Discontinuation of the causative drug, along with a course of steroids, can help in reversing the symptoms. Though the differential of mesalamine-induced lung injury, cannot be confirmed nor excluded here, this patient probably had underlying lung pathology from his CD or its treatment, making his recovery from COVID-19 more complicated (Figure).



[2743] **Figure 1.** A: Portable Chest X-ray showing multifocal pneumonia, low lung volumes with bilateral patchy airspace disease; B, C: CT-Chest showing peripherally distributed ground-glass

opacities, distributed in upper and lower lobes. There were superimposed early diffuse lung fibrotic changes, without any evidence of pulmonary thromboembolism; D: CT Chest, 5 months post-discharge, showing improvement in opacities.

S2744

Loperamide-Induced Ventricular Fibrillation Cardiac Arrest in the Setting of Recently Diagnosed Ulcerative Colitis

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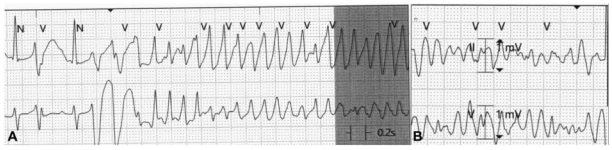
Introduction: Loperamide is a peripheral mu opioid receptor agonist that inhibits intestinal peristalsis and decreases fluid and electrolyte loss. While typically used over-the-counter for diarrhea, it may cause cardiotoxicity at higher dosages, leading to arrhythmia and cardiac arrest.
Case Description/Methods: A 36 year-old female with a recent diagnosis of ulcerative colitis, presented with unresponsiveness while eating dinner. Cardiopulmonary resuscitation was initiated by family, found to be in ventricular fibrillation by paramedics. Return of spontaneous circulation was achieved after one defibrillation and administration of epinephrine. Upon admission to the intensive care unit, she developed torsades de pointes leading to recurrent ventricular fibrillation cardiac arrest, requiring 12 defibrillations and subsequent esmolol and lidocaine infusions. Computed tomography pulmonary angiogram was unremarkable for pulmonary embolism, and transthoracic ultrasound revealed no structural abnormalities. Cardiac MRI had no evidence of acute myocarditis or infiltrative cardiomyopathy. Cardiac catheterization revealed nonobstructing coronary arteries. For secondary prevention, an implantable cardiac defibrillator was placed. Upon further discussion after unplanned self-extubation, patient disclosed that she had been overutilizing loperamide at about 16 mg daily to help control her frequent episodes of diarrhea. (Figure)
Discussion: Loperamide may act similar to antiarrhythmic medications, with dose dependent effects causing ventricular instability. Blockage of sodium channels prolongs the QRS complex causing polymorphic ventricular tachycardia, which may develop into torsades de pointes, ventricular fibrillation and cardiac arrest. Loperamide may be dosed over-the-counter up to 8 mg per day. While the half-life of loperamide is 9 to 14 hours, it may be greater than 40 hours at 16 mg doses, likely due to decreased peristalsis that slows its rate of absorption. Typical management of QTc prolongation arrhythmias due to medications may be refractory in loperamide-induced cardiotoxicity, including sodium bicarbonate, magnesium sulfate, amiodarone and defibrillation. Cardiac stabilization may not be obtained for up to 5 days. While most cases of loperamide-induced cardiotoxicity have been related to alleviating symptoms of opioid withdrawal or causing euphoria, our patient exemplifies an attempt to control symptoms of new onset Ulcerative Colitis.



[2744] **Figure 1.** Telemetry strips showing polymorphic ventricular tachycardia (A) inducing ventricular fibrillation (B).

S2746

Mesenteric Venous and Portal Vein Thrombosis in a Patient With Ulcerative Colitis: Delayed Post-Operative Presentation or Hypercoagulable State?

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Introduction: Mesenteric venous thrombosis (MVT) and portal vein thrombosis (PVT) are conditions involving occlusion of the vascular supply of the intestinal system. The symptoms of MVT and PVT may be nonspecific, however, patients may present with acute abdominal pain. The cause of venous thrombosis of the gastrointestinal system may be multifactorial, including patients with pro-coagulable conditions. Here we present the case of a patient with ulcerative colitis (UC) who underwent a recent colectomy with end ileostomy and arrived at the Emergency Department (ED) with acute abdominal pain secondary to superior mesenteric vein thrombosis extending into the portal vein.
Case Description/Methods: This is the case of a 40-year-old male with a history of refractory ulcerative colitis diagnosed 7 years before admission, with evidence of disease on descending, sigmoid, and rectum. He underwent laparoscopic total abdominal colectomy with end ileostomy a month before admission. His symptoms were controlled with Ustekinumab and Prednisone tapering. The patient arrives at the ED with symptoms of tenesmus, generalized abdominal pain, and rectal bleeding. His physical examination was remarkable for hemodynamic stability and diffuse abdominal pain on palpation, without rebound or guarding. Abdominopelvic computed tomography with intravenous contrast revealed a large intramural thrombus extending from the superior mesenteric vein into the portal vein. The patient was started on an intravenous heparin drip, which was transitioned to direct oral anticoagulation therapy prior to discharge.
Discussion: Patients with ulcerative colitis who require surgical intervention are at an increased risk of thromboembolic events. Here, we presented the case of a patient with evidence of extensive portomesenteric thrombosis with delayed onset after surgical intervention. Post-operative thrombosis is prevalent within 7-10 days after surgery. However, our patient presented with extensive thrombosis more than 1 month after the intervention. Our case raises concerns regarding the multifactorial etiology of the patient's presentation. Moreover, UC has been known to increase prothrombotic state. Therefore, this case highlights how MVT in patients with UC may be secondary to a combination of factors, such as the hypercoagulable state of UC due to chronic inflammation and mechanical endothelial injury from surgical intervention. Prompt evaluation is essential to prevent intestinal infarction and reduce morbidity and mortality in these patients.

S2747

Malignant Peritoneal Mesothelioma Seen on MRI Enterography During IBD Colitis Investigation in a 32-Year-Old Non-Asbestos Exposed Female Healthcare Worker

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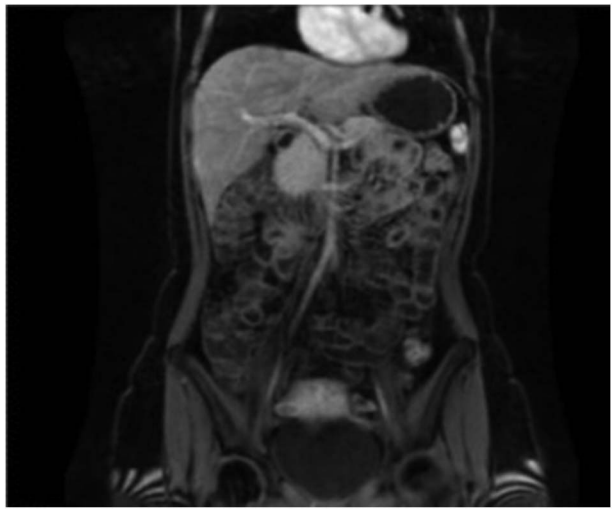
Introduction: This case describes an unexpected diagnosis of a malignant peritoneal mesothelioma (MPM) in a 32 y/o female physician without any known asbestos exposure. She presented to our department with a prior diagnosis of non-celiac gluten intolerance and intermittent but worsening left-sided abdominal pain for over 20 years. Several CTs suggested findings associated with IBD-related etiology and IBD specialist consultation was advised. After negative EGD/colonoscopy, an MRI Enterography revealed a small enhancing nodule suggestive of peritoneal malignancy. Pathology report after biopsy revealed a biphasic MPM. This case highlights the insidious nature of MPM and adds to the body of literature suggestive of IBD-mimicking symptomatology associated with this disease.
Case Description/Methods: A 32 y/o F presented with chronic intermittent left-sided abdominal pain and gluten intolerance. Throughout her life, she reports 2-week periods of abdominal pain that is usually dull and sometimes sharp. The pain is focused LUQ with occasional LLQ pain. This is worsened by acute angle bending and deep palpation to the area. The patient still experiences pain despite a gluten-free diet. EGD is negative for celiac disease. CT imaging showed a left-sided pericolonic abscess and wall thickening of the lower descending and proximal sigmoid colon. An ill-defined soft tissue density in the left paracolic gutter was also seen and classified as a reactive lymph node. Abscess underwent CT aspiration; follow-up CT noted a new focal area of segmental wall thickening in the ascending colon with an inflamed diverticulum. IBD consult was recommended where negative EGD/colonoscopy resulted in MRI Enterography referral and results suggestive of peritoneal malignancy (Figure). Pathologic examination confirmed the presence of MPM, biphasic type (epithelial/spindle) with cytologic atypia and invasive growth being consistent with malignancy. The patient is on nivolumab, ipilimumab, carboplatin, pemetrexed and leuprolide for the next 3 months and considering debulking.
Discussion: MPM presenting with decades long history of LUQ/LLQ pain exacerbations is rarely seen. CT results led to consideration of IBD etiology, as wall thickening, inflamed diverticulum, and a timeline suggestive of IBD was described. The lack of asbestos exposure highlighted the unlikely MPM differential. Prompt advanced imaging was key to diagnosis. Due to the insidious nature of MPM and poor outcomes, further exploration of timely advanced imaging is warranted.



[2747] **Figure 1.** MRI enterography reveals no evidence of active or chronic inflammatory bowel disease and no evidence of diverticulitis or diverticular abscess. There is a 10 mm enhancing nodule along the serosal margin of the splenic flexure in the left upper quadrant that is suspicious for a peritoneal malignancy.

S2748

Necrobiotic Lung Nodules in Patient With Ulcerative Colitis

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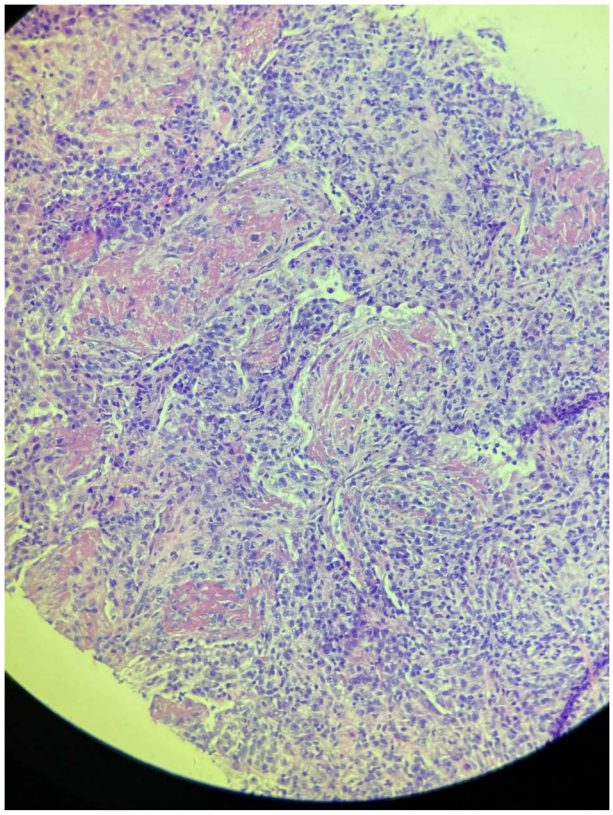
Introduction: Ulcerative colitis and Crohn's disease are two forms of inflammatory bowel disease (IBD). 25-40% of IBD patients have extra-intestinal manifestations (EIM). Pulmonary manifestations are one of the rarest forms of EIM, particularly necrobiotic nodules. It is a challenge to diagnose as it presents with symptoms similar to autoimmune, vasculitis, or infectious pathologies. We present a rare case of a patient who was found to have necrobiotic lung nodules during an acute ulcerative colitis flare.
Case Description/Methods: 44-year-old male with newly diagnosed ulcerative pancolitis, presented with diarrhea and hematochezia for 8 weeks and 4 weeks of leg ulcers. He denied any other symptoms. 4 months ago, he was started on high dose steroids and switched to vedolizumab, however began to relapse after steroids were tapered. On admission, vitals significant for tachycardia at 118 bpm. Physical exam was significant for lower extremity ulcers consistent with pyoderma gangrenosum. Labs significant for leukocytosis (16,500/μL), Hg of 6.8, and elevated CRP at 160.26. Findings were suggestive of IBD flare and he also underwent chest x-ray which showed multifocal nodular airspace opacities, which appeared to have developed cavitations. CT chest revealed bilateral pulmonary nodules. He underwent infectious, autoimmune and vasculitis work up including HIV, tuberculosis, bacterial, viral, endocarditis, ANA, ANCA as well as fungal serologies which were all negative. He had CT guided biopsies, which were suggestive of necrobiotic lung nodules. Repeat CT chest showed interval improvement in solid and cavitary nodules. Given extensive negative infectious work up and improvement with steroids and infliximab, his presentation was consistent with necrobiotic lung nodules secondary to uncontrolled inflammatory bowel disease. (Figure)
Discussion: We describe a rare case of necrobiotic lung nodules as an extra-intestinal manifestation of uncontrolled ulcerative colitis. Histologically, these nodules are sterile aggregates of neutrophils, that can cavitate and have a high degree of resemblance to pyoderma gangrenosum in cases of IBD. Few cases of necrobiotic lung nodules with IBD have been reported and most of them had respiratory symptoms but our case did not present with respiratory manifestations. In conclusion, necrobiotic lung nodules should be considered as a differential diagnosis of lung nodules in patients with IBD while excluding any infectious etiologies as mandatory before starting treatment with steroids and biologics.



[2748] **Figure 1.** CT guided biopsy suggestive of necrobiotic lung nodule.

S2749

Not Just Another Infection: Rare Case Abscess in Ulcerative Colitis

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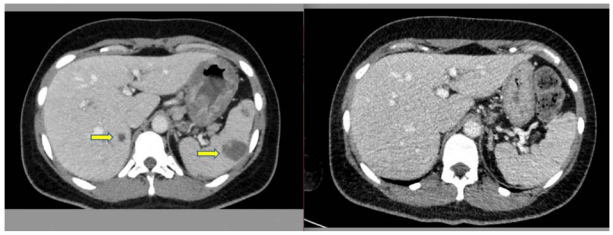
Introduction: Aseptic abscess syndrome (AAS) is a rare manifestation of inflammatory bowel disease (IBD). This condition is characterized by sterile neutrophilic infiltration of deep tissues, most often in the spleen, liver, skin, or lymph nodes. Patients commonly present with fever, abdominal pain, and weight loss. We present a case of a 40-year-old female diagnosed with AAS in the setting of IBD.
Case Description/Methods: A 40-year-old female with a history of Ulcerative Colitis (UC) not on treatment for past 2 years presented with 2 weeks of bloody diarrhea, left-sided abdominal pain, unintentional weight loss, and fatigue. On exam, she was tachycardic, normotensive, and had left lower quadrant abdominal tenderness. Initial lab work was significant for leukocytosis of 23.3×10^9 /L and elevated C-reactive protein. Computed tomography (CT) scan of the abdomen demonstrated diffuse colonic thickening and multiple hepatosplenic abscesses. Broad-spectrum antibiotics were initiated. She underwent colonoscopy which revealed Mayo 2 colitis from rectum to the distal transverse colon. Blood cultures (fungal, bacterial, and mycobacterial) and parasitic serologies were negative. Fluid aspiration from the spleen drained purulent material, but fluid cultures were negative. Despite treatment with broad-spectrum antibiotics, and antifungals, the patient continued to remain febrile with persistent leukocytosis and gastrointestinal symptoms. After ruling out infectious and neoplastic processes, a diagnosis of aseptic abscess syndrome was made. Systemic steroids were initiated with resulting improvement in her symptoms and lab parameters. The patient was discharged home on a steroid taper. Repeat cross-sectional imaging performed 3 weeks post-discharge demonstrated complete resolution of all abscesses. For UC, she was started on Vedolizumab and she remains in clinical remission. (Figure)
Discussion: AAS is a diagnosis of exclusion. This syndrome should be considered in IBD patients in the setting of multiple disseminated abscesses with a negative infectious work-up and lack of clinical improvement with antimicrobial agents. The specific pathophysiology is largely unknown, although similar neutrophilic infiltration can be seen in pyoderma gangrenosum. Antibiotic therapy is universally ineffective for AAS. However, about 95 % of patients respond to corticosteroids. Disease-modifying agents and biologics have been successfully used as maintenance therapy.



[2749] **Figure 1.** Initial and subsequent CT imaging of abdomen/pelvis with contrast demonstrating hepatic and splenic abscesses with interval improvement of abscess.

S2750

Mucosa-Associated Lymphoid Tissue Lymphoma of the Rectum Incidentally Found in a Patient with Ulcerative Colitis

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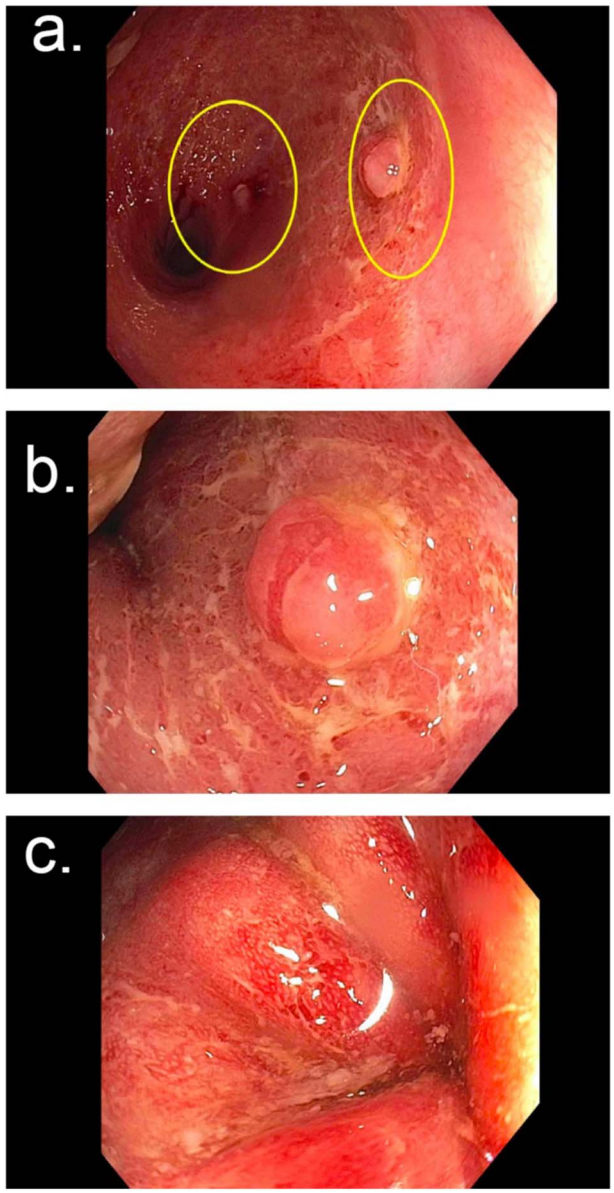
Introduction: Mucosa-associated lymphoid tissue (MALT) lymphomas are extra-nodal marginal zone B-cell lymphomas, most commonly found in the stomach, associated with *Helicobacter pylori* infections, and generally not linked with inflammatory bowel disease. Rectal MALT lymphoma is very uncommon and often associated with painful defecation, change in bowel habits, or rectal pressure/prolapse. Here, we present a rare case of an asymptomatic female with ulcerative colitis (UC) found to have benign-appearing rectal polyps during a routine screening colonoscopy.
Case Description/Methods: The patient is a 56-year-old female with a history of left-sided UC, diagnosed in 1993, with one flare after receiving the 2nd dose of the Moderna COVID-19 vaccine, taking oral Olsalazine 500 mg twice daily, low-dose Prednisone, and mesalamine suppositories as needed presenting for screening colonoscopy. The patient was asymptomatic, citing regular non-bloody bowel movements and normal stool consistency. Colonoscopy revealed two 7 mm sessile, non-bleeding rectal polyps, surrounded by congested, erythematous, friable, and ulcerated mucosa in the rectosigmoid colon. Cold forceps biopsies were taken. Hematopathology evaluation of the routine colon biopsy samples revealed chronic nonspecific colitis while pathology of the rectal polyps showed marked lymphoplasmacytic infiltrate and extra-nodal marginal zone lymphoma of MALT. Ancillary studies, immunohistochemistry, and molecular studies for B-cell gene rearrangement confirmed extra-nodal marginal zone lymphoma of MALT with prominent plasmacytic differentiation. The patient was informed and close follow-up in Gastroenterology clinic was arranged. (Figure)
Discussion: Rectal MALT lymphoma is rare with unclear management options. Treatments of UC include watchful waiting, surgical resection, endoscopic mucosal resection, radiation, and/or chemotherapy. *Helicobacter pylori* infections, though strongly linked with *gastric* MALT lymphoma, have not been shown to be strongly correlated with *rectal* MALT lymphoma. Given that patients with UC have chronic UC-associated colonic inflammation, lymphoma is often difficult to distinguish visually during colonoscopy, frequently masked by ulcerations and pseudo-polyps. In cases like these, more definitive treatments such as surgical resection could therefore be warranted. Long-term follow-up data is sparse and definitive management remains a clinical conundrum, thus these patients require reliable long-term multidisciplinary close follow-up.



[2750] **Figure 1.** a. 2 sessile 7 mm rectal polyps; b. rectal polyp; c. rectosigmoid junction.

S2751

Non-Obstructive Sinusoidal Dilation in a Patient With Crohn's Colitis

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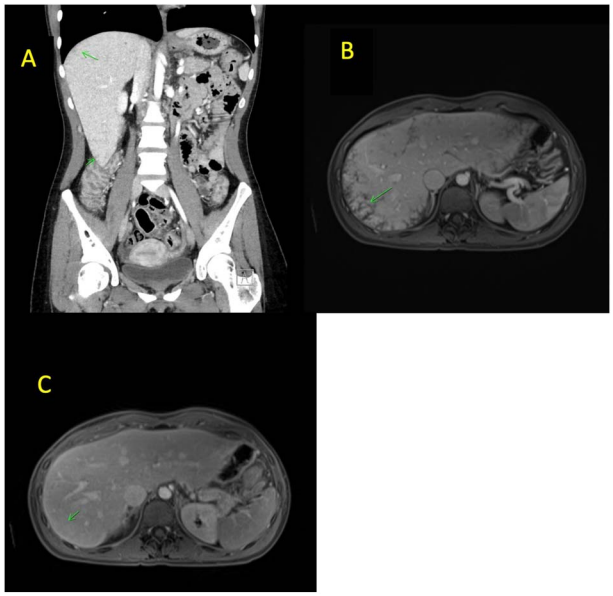
[1]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; [2]Rutgers Robert Wood Johnson University Hospital- New Brunswick, New Brunswick, NJ.

Introduction: Non-obstructive sinusoidal dilation (NOSD) is an enlargement of the hepatic capillaries without venous outflow obstruction. It is characterized by a "mosaic pattern" of mottled and reticular hepatic enhancement radiographically and by distended sinusoidal spaces most evident in Zone III histologically. While it has been associated with active malignancy, certain medications, and inflammatory conditions, an understudied association exists between NOSD and IBD.
Case Description/Methods: We present a 27-year-old female recently diagnosed with sigmoid-sparing Crohn's colitis. Despite initiating mesalamine therapy, her symptoms progressed. A CT abdomen/pelvis noted the colitis, as well as heterogeneous attenuation of the liver (Fig 1a). MRI/MRCP identified abnormal reticular enhancement in the right hepatic lobe without blockage in venous outflow, consistent with NOSD (Fig 1b,1c). Liver chemistries revealed no hepatocellular or cholestatic abnormalities. The patient's IBD symptoms improved with the initiation of glucocorticoids and adalimumab, allowing for discharge to outpatient follow-up.
Discussion: While the etiology of NOSD is not well understood, pre-clinical evidence suggests that altered angiogenesis may play a role. Mice injected with vascular endothelial growth factor (VEGF) produce tumors containing massive NOSD, which reverse with anti-VEGF therapy.1 Additionally, mice overexpressing either IL-6 or IL-6 receptor demonstrate sinusoidal dilation and nodular hyperplasia.1 Interestingly, IBD patients also have increased levels of VEGF, IL-6, and IL-6 receptor, which may contribute to their risk of dysregulated angiogenesis and NOSD development. (Figure) There is still little research on the natural history of NOSD and its response to treatment of underlying comorbidities. A single-center study of a patient with Crohn's disease found that the degree of NOSD remained unchanged in the patient when comparing liver biopsy specimens collected pre-and post-surgical resection of disease. 2 Therefore, treatment of underlying IBD may not resolve associated NOSD, unlike estrogen-induced NOSD for which laboratory abnormalities are reversible upon medication withdrawal.



[2751] **Figure 1.** A) Contrast enhanced CT coronal image shows peripheral low density reticular pattern of sinusoidal dilation. B) Contrast enhanced T1 weighted axial image during portal venous phase shows peripheral reticular pattern without enhancement of the hepatic sinusoids, indicating sinusoidal dilation. C) Contrast enhanced T1 weighted axial image 5 minutes after the portal venous phase shows filling in with contrast of the hepatic sinusoids, indicating non-obstruction.

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S2752

New Onset Inflammatory Bowel Disease Due to Anti-IL-17 Therapy With a Unique Twist

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Introduction: Both psoriasis and inflammatory bowel disease (IBD) are driven by inappropriate immune responses. Antibody therapy to the pro-inflammatory cytokine interlukin-17 (IL-17) has been associated with de-novo IBD. We describe two cases of new onset IBD in patients started on anti-IL-17 antibodies ixekizumab and secukinumab, both with unique clinical courses.
Case Description/Methods: Patient 1: A 47-year-old woman with hypertension, type 2 diabetes mellitus, and psoriasis presented with 2 weeks of abdominal cramping and rectal bleeding. She had been stable on brodalumab but switched to ixekizumab two months prior to presentation. She denied a family history of IBD. Her labs were notable for mild leukocytosis, thrombocytosis, and elevated CRP. CT showed evidence of descending colitis. Colonoscopy revealed multifocal colitis, with biopsies suggesting IBD or drug-induced colitis. She was started on ustekinumab for Crohn's disease which resolved her GI symptoms. Repeat colonoscopy one year later confirmed endoscopic and histologic remission. Patient 2: A 36-year-old woman with pre-diabetes and psoriasis presented with watery diarrhea, abdominal cramping and stool discharge per vagina one week after switching from adalimumab to secukinumab. She reported a family history of Crohn's disease in her mother. Her labs were notable for leukocytosis, thrombocytosis, and elevated CRP. CT revealed left sided colitis and MR showed a rectovaginal fistula. Colonoscopy revealed ileo-pancolitis and biopsies were consistent with IBD or drug-induced colitis. Secukinumab was discontinued. One week after discharge, the patient reported cessation of stool discharge per vagina and improvement in diarrhea and abdominal pain.
Discussion: These case reports add to the literature that describes a relationship between IL-17 antagonism and IBD. Patient 1 is unique in that she was exposed to two different IL-17 antibodies prior to her diagnosis of IBD and she represents the first reported case of ustekinumab rescue of ixekizumab-induced IBD. Patient 2 is the only case of IL-17-induced IBD with a rectovaginal fistula described in the literature. Although recent meta-analyses do not show a statistically significant relationship between anti-IL-17 therapy and *de-novo* IBD, further study is warranted. Providers should avoid anti-IL-17 therapies for patients with a personal history of IBD and should monitor patients on these therapies closely for the development of IBD.

S2753

Nodular Regenerative Hyperplasia-Induced Peristomal Variceal Bleeding: A Rare Thiopurine Side Effect

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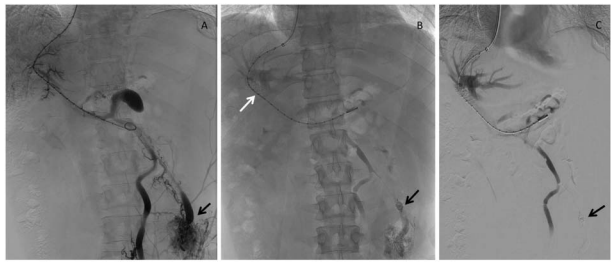
Introduction: Azathioprine (AZA) and 6-Mercaptopurine (6-MP) are agents used to treat Inflammatory Bowel Disease (IBD). One of the rare side-effects described in cases throughout the literature is the development of Nodular Regenerative Hyperplasia (NRH) of the liver. NRH can lead to the development of non-cirrhotic portal hypertension (NCPH) which can then progress to ascites and varices. We present a patient who developed NRH from long-standing 6MP leading to peristomal variceal bleeding.
Case Description/Methods: This case involves a 12 y/o male with fistulizing and stricturing Crohn's disease, who was on 6-MP monotherapy from ages 14-18 and then restarted at age 27. At age 29, he underwent a partial colectomy with colostomy creation. Subsequently, he began to experience blood in his ostomy bag, which was later identified to be due to peristomal varices. Abdominal CT revealed lower esophageal varices and a nodular appearing liver. Liver biopsy then confirmed NRH, which had progressed to NCPH, and ultimately bleeding peristomal varices. The patient underwent a successful TIPS procedure with resolution of the varices and has not had any further bleeding. (Figure)
Discussion: While there are a few cases of esophageal and gastric variceal bleeding due to NCPH secondary to thiopurine induced NRH, a case of peristomal variceal bleeding has yet to be described. NRH is a poorly understood condition that is characterized by diffuse transformation of normal liver parenchyma into small regenerative nodules with little to no fibrosis. Increased liver nodularity can cause NCPH and subsequently formation of varices throughout the GI tract. Patients with IBD on thiopurines have a cumulative incidence of NRH of 0.6% and 1.28% at 5 and 10 years, respectively1. NRH has a variable clinical presentation- from asymptomatic to severe complications of NCPH–and patients often do not present until late in the disease course. Several risk factors associated with development of NRH are male sex, stricturing and/or fistulizing disease, and history of a bowel resection. While NRH and its pursuing complications from thiopurines remains a rare entity, clinicians should be cognizant of this potential complication–particularly in those with fistulizing/stricturing disease and/or a surgical resection with an ostomy who present with gastrointestinal bleeding.



[2753] **Figure 1.** A – Digital subtraction angiographic (DSA) image shows catheter-directed venography of a dilated branch of the inferior mesenteric vein (IMV) that supplies a network of peristomal varices (black arrow). B - After successful creation of a transjugular intrahepatic portosystemic shunt (TIPS) with a covered stent (white arrow), a DSA image shows a plug and foam (black arrow) in the dilated IMV branch with decreased blood flow into the peristomal varices. C- Final DSA image of completion IMV venography shows absent blood flow into the dilated IMV branch and peristomal varices.

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S2754

New-Onset Inflammatory Bowel Disease After Ixekizumab Initiation for Psoriatic Arthritis

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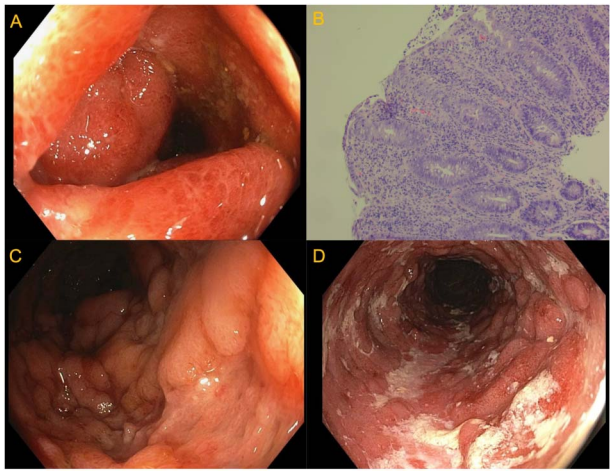
Introduction: Monoclonal antibodies have become common practice for treatment of psoriatic arthritis (PsA), inflammatory bowel disease (IBD), and many autoimmune diseases. IL-17 inhibitors (IL-17i), such as Ixekizumab (IXE), are suspected to paradoxically exacerbate subclinical IBD or induce new-onset IBD in psoriatic arthritis patients.
Case Description/Methods: A 50-year-old male presented with worsening upper abdominal pain, intermittent fevers, and diarrhea for 3-weeks. Patient began IXE 2-months prior for PsA. One-week before admission, computed tomography (CT) showed changes consistent with proximal and transverse colitis, autoimmune panel found ASCA IgG 27.7. Colonoscopy 3-years prior for hemorrhoidal banding showed diverticulosis in the sigmoid colon. On arrival, patient was hypotensive with labs: fecal calprotectin 3424 mcg/g, ESR 40 mm/hr, CRP 227 mg/L, and C. difficile negative. IXE was held and colonoscopy revealed severe rectal proctitis, sparing of sigmoid and distal descending colon, with inflamed ulcerations in the transverse colon preventing advancement of the scope, leading to initial diagnosis of indeterminate IBD (A,B). While on IV methylprednisolone 20 mg every 8 hours for 1-week, symptoms persisted with repeat labs: fecal calprotectin 725 mcg/g, ESR 11 mm/hr, CRP 1.72 mg/L. Repeat colonoscopy showed improved inflammation in a continuous circumferential pattern from transverse colon to the cecum, with sparing of the rectum and descending colon (C). Days later, he improved and was discharged with outpatient follow-up on oral prednisone 40 mg. One-month later, patient worsened with fecal calprotectin 2990 mcg/g. After another month, colonoscopy revealed pancolitis from rectum to cecum (D), with biopsies, diagnosis of ulcerative colitis was confirmed. Patient was initiated on Adalimumab shortly after and is now feeling significantly better as he tapers off his steroid regimen. (Figure)
Discussion: IL-17i's ability to affect cell dysregulation and gut dysbiosis can explain the suspected risk of IBD in PsA. Recent literature has found rare cases and low incidence rates of new-onset IBD when treating diseases like PsA with IL-17i (2.4 per 1000 patient-years). Despite the rarity, there are practical recommendations prior to initiating IL-17i: discuss adverse risks, screen IBD history, obtain fecal calprotectin, and if $>$ 250 mcg/g with further testing confirming inflammation (colonoscopy, CT), IL-17i are contraindicated and alternative immunosuppressive agents are recommended.



[2754] **Figure 1.** (A) Colonoscope view of transverse colon; inflammation characterized by congestion, erythema, and friability in a continuous and circumferential pattern from descending colon to the transverse colon, graded as Mayo Score 3 (severe, with spontaneous bleeding, ulcerations) preventing colonoscope from advancing past the transverse colon. (B) Rectal biopsy found severe chronic active proctitis, crypt abscesses, and mucosal erosions/ulceration; negative for dysplasia or granulomas. (C) Repeat colonoscope view of transverse colon; colitis with altered vascularity, congestion and pseudopolyps in a continuous circumferential pattern from transverse colon to the cecum. (D) Final colonoscope view of transverse colon; mild to severe pancolitis from rectum to cecum, with superficial ulcerations and friability of mucosa, Mayo Score 3.

S2755

New-Onset Crohn's Disease Unmasked by Secukinumab

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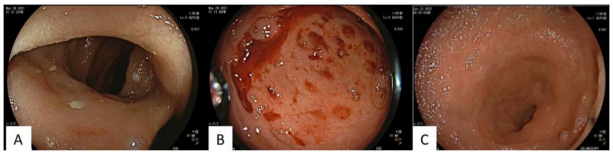
Introduction: Psoriasis is an autoimmune disease that affects 1% to 2% of the population. Patients with this condition showed high expression of proinflammatory cytokines including interleukin (IL)-17. Secukinumab, an IL-17 inhibitor, is indicated for the treatment of psoriasis and psoriatic arthritis. IL-17 inhibition in patients with Crohn's disease may be associated with worsening of the disease. We present the case of a 38-year-old female who received secukinumab therapy for psoriatic arthritis with subsequent unmasking of Crohn's disease.
Case Description/Methods: A 38-year-old female with psoriatic arthritis, presented with generalized abdominal pain, and diarrhea. She had no prior history or family history of inflammatory bowel disease (IBD). She started treatment with secukinumab one month prior to her presentation. After receiving 4 doses of secukinumab, she developed fecal urgency, watery diarrhea with intermittent hematochezia. Laboratory evaluation showed elevated inflammatory markers. Computed tomography of the abdomen showed colitis. Secukinumab was stopped and the patient was scheduled for esophagogastroduodenoscopy and colonoscopy which revealed ulcers in the antrum, terminal ileum, and throughout the colon. Biopsies showed acute and chronic colitis consistent with Crohn's disease. Secukinumab was changed to infliximab which led to resolution of her symptoms. Six months later, colonoscopy showed no active inflammation (Figure).
Discussion: IL-17 is a proinflammatory cytokine that has a significant role in autoimmune disorders including psoriasis and psoriatic arthritis. IL-17 may play a protective role in IBD. A few case reports describing new-onset IBD in patients treated with secukinumab, IL-17 inhibitor, have been reported. The incidence rate of IBD in patients treated with secukinumab in 21 pooled studies was 0.56%. In our case, IBD was unmasked one month after starting secukinumab. This rare occurrence can happen anytime from one week up to one year or longer after starting secukinumab. Although studies have shown very low incidence of new onset or exacerbation of preexisting IBD with IL-17 inhibitors, this association is not negligible. Clinicians should perform thorough risk stratification and screening for IBD prior to therapy and close monitoring for new-onset or worsening IBD following IL-17 inhibitor therapy initiation. Other agents that target IL-23 (ustekinumab) instead of IL-17 have shown promise in treating both psoriasis and IBD.



[2755] **Figure 1.** Colonoscopy from 5/2021 shows terminal ileum with aphthous ulcerations (A) and scattered ulcerations in the rectosigmoid (B). Colonoscopy from 1/2022 shows normal ileum (C).

S2756

Not So Sweet: A Rare Extraintestinal Manifestation in Crohn's

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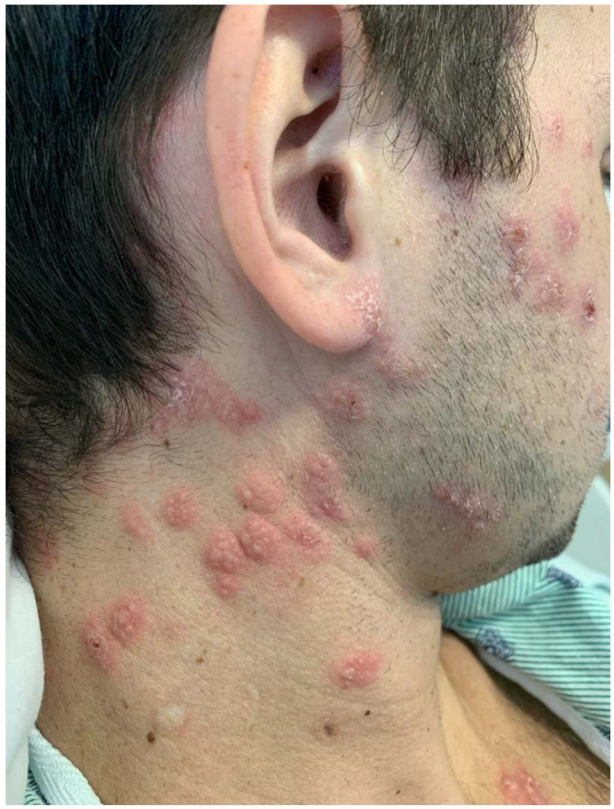
Introduction: Acute febrile neutrophilic dermatosis (Sweet's syndrome) is a rare extraintestinal manifestation (EIM) of inflammatory bowel disease (IBD). Other neutrophilic dermatoses include pyoderma gangrenosum and erythema nodosum. Only 40 cases associated with Crohn's disease have been reported in the literature. Characteristics include abrupt onset of painful erythematous nodules with fever, arthralgias, and leukocytosis which typically resolve with systemic corticosteroids.
Case Description/Methods: We describe a case involving a 22-year-old male with presumed UC associated fulminant colitis and perforation requiring ostomy. During staged proctocolectomy with plans for a J pouch, he underwent flexible sigmoidoscopy with biopsies consistent with UC. He was started on high dose Infliximab. One month after being placed in continuity as the final stage of J pouch creation, he developed fevers and wound dehiscence. Imaging revealed fistula formation giving rise to the concern for Crohn's colitis. Despite antibiotics, his fevers persisted. During this hospitalization, he developed red papules and pustules with peripheral scaling on his face spreading across his body (picture 1) with evidence of pathergy at IV sites. Dermatology diagnosed him with acute febrile neutrophilic dermatosis. Despite the concern for poor wound healing, he was treated with IV corticosteroids 1mg/kg for 5 days with resolution of his lesions. He remains stable on Infliximab.
Discussion: Most commonly, Sweet's Syndrome is reported in women (87%) and associated with active disease (67-80%). It is more common in Crohn's disease than in UC. Early recognition is important in order to start corticosteroids quickly in concert with traditional IBD therapy. Not only does this case demonstrate a rare finding of Sweet's syndrome in a male with Crohn's, it brings up an important discussion about acute systemic corticosteroid therapy initiation during the perioperative period. It is known that corticosteroids affect the process of wound healing. This case highlights a favorable outcome despite use of high dose steroids in this patient who was critically ill requiring treatment. In review of existing literature, 1 randomized double-blind study evaluated the effect of acute administration of steroids in the perioperative period. This study discovered no wound infections and only 1 patient with wound dehiscence. Sweets is a rare EIM and in severe presentations, systemic steroids are indicated, despite presenting in the immediate perioperative period.



[2756] **Figure 1.** Picture 1.

S2757

Eye-BD—A Rare Case of Orbital Myositis as an Extra-intestinal Manifestation of Crohn's Disease

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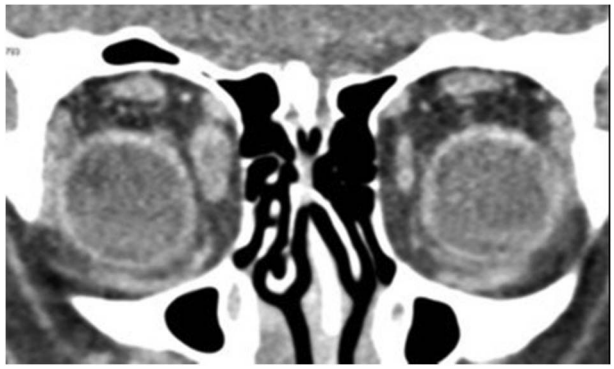
Introduction: Crohn's Disease (CD) is often associated with a diverse array of extra-intestinal manifestations (EIMs). The estimated prevalence of EIMs in patients with CD is 25-70%. The estimated prevalence of ocular manifestations in patients with CD is 3.5-6.8%. Orbital myositis (OM), characterized by inflammation of the extraocular muscles, is a rare ocular EIM associated with CD.
Case Description/Methods: A 22-year-old female with CD on ustekinumab for maintenance therapy in remission presented with three days of right eye swelling and pain with extraocular movements. CT of the orbits reported minimal pre-septal tissue swelling, without evidence of orbital cellulitis. She was started on NSAIDs. A week later, the patient presented to the Ophthalmology clinic with resolution of her right eye symptoms but with new, similar symptoms in her left eye, including diplopia, restriction of lateral and medial gaze, and chemosis of the lateral conjunctiva. She denied symptoms concerning for a Crohn's flare or other EIMs. The initial CT of the orbits was reviewed, and an addendum was made, reporting subtle enlargements of multiple extra-ocular muscles in the right orbit. She was diagnosed with bilateral OM. Infectious, endocrine, and autoimmune work-up was performed which were unrevealing and her OM was likely an EIM of her CD. She was started on prednisone 40 mg daily, which resulted in complete resolution of her symptoms at one-week follow-up. She was kept on ustekinumab maintenance therapy as she remained in clinical remission without evidence of other EIMs and completed her steroid taper without further complication. The patient was informed of the high recurrence rate of CD-associated OM and close follow-up was arranged. (Figure)
Discussion: Overall, our patient's OM was a likely EIM of her CD, as further laboratory work-up for commonly implicated etiologies to include thyroid disease, vasculitides, sarcoidosis, and IgG4-related disease was all negative. This case illustrates a rare EIM of CD in a patient believed to be in clinical remission, emphasizing the point that certain EIMs may occur independently of gastrointestinal luminal disease activity. Given that a high index of suspicion was necessary to reach the diagnosis given the subtle exam and imaging findings, this case also reiterates the importance of timely diagnosis and early management to minimize morbidity risk, which can be best accomplished through multidisciplinary coordination among subspecialty providers.



[2757] **Figure 1.** Orbital CT, Coronal- Asymmetric enlargement of the medial rectus in the RT orbit.

S2758

Extraintestinal Manifestations of Ulcerative Colitis Presenting as Tracheobronchitis

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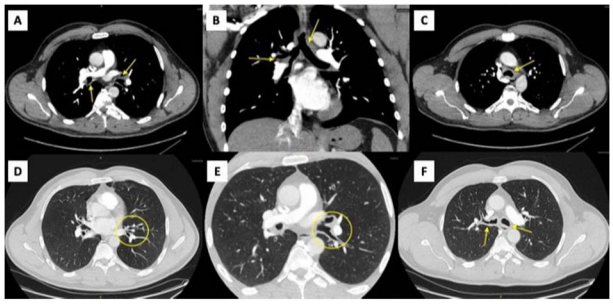
Introduction: Ulcerative Colitis (UC) is an inflammatory condition primarily involving the colon but is commonly associated with different extraintestinal manifestations. However, pulmonary manifestations, specifically tracheal involvement, in UC is extremely rare with only a few documented cases in the literature to date. We present a case of pulmonary manifestations of UC presenting as a chronic cough in a patient with UC status post colectomy.
Case Description/Methods: A 54-year-old male with a past medical history of GERD, reflux laryngitis, and UC status post total colectomy with J-pouch 10 years prior presented to his primary care provider's office with the complaint of persistent shortness of breath. Associated symptoms included hoarseness and a chronic cough with thick sputum production and chest tightness. On examination, the patient had extensive wheezing and thus was instructed to utilize an albuterol inhaler and was prescribed a 10-day prednisone taper. Following completion of the prescribed regimen, the patient's chest tightness and dyspnea improved but his hoarseness and cough persisted. The patient was therefore started on Fluticasone Furoate-Vilanteril 100-25 mcg/inhalation and sent for chest imaging. CT chest was completed and revealed moderate, concentric thickening of the trachea and walls of the bronchi and bronchioles. There was no evidence of parenchymal disease or serositis, but findings were very suspicious for pulmonary UC involvement (Image 1). Following initiation of Fluticasone Furoate-Vilanteril, the patient did have moderate improvement in symptoms. However, considering the CT imaging findings, the decision was made to increase the dosage to Fluticasone Furoate-Vilanteril 200-25 mcg/inhalation to allow for inflammatory suppression over the course of next couple of months. (Figure)
Discussion: Bronchopulmonary involvement only occurs in 0.21 to 0.4% of all inflammatory bowel disease (IBD) cases, and there are less than 20 documented cases of tracheobronchitis in patients with UC in the literature to date. Few of these cases have occurred in patients whose IBD have been in remission or have undergone total colectomies the year prior. Fortunately, pulmonary involvement in UC responds favorably to corticosteroids often resulting in quick improvement both clinically and radiographically. However, given its manifesting symptoms, patients can be easily misdiagnosed with asthma or COPD if physicians do not have a high index of suspicion.



[2758] **Figure 1.** A-F: Moderate concentric thickening of the wall of the trachea and diffuse thickening of the walls of the bronchi and bronchioles. Overall findings highly suspicious for airway involvement of ulcerative colitis.

S2759

Case of Concomitant Cryptosporidiosis and Ulcerative Colitis

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Introduction: Cryptosporidiosis is a parasitic infection of gastrointestinal epithelia that presents primarily as acute watery diarrhea. In patients with inflammatory bowel disease (IBD), cryptosporidiosis can be mistaken for a flare. We present a case of an active duty service member with positive Cryptosporidium PCR on workup of what appeared to be an ulcerative colitis (UC) flare.
Case Description/Methods: A forty-three year-old male presented after two weeks of acutely worsening diarrhea, rectal pressure, blood with wiping, and bloating. Testing for Cryptosporidium was negative by routine histology and Giemsa and GMS stains of duodenal biopsies but was positive on a stool PCR panel. Both calprotectin and CRP were elevated. Colonoscopy showed inflammation to 30cm with friability, spontaneous hemorrhage, and ulceration. He was started on nitazoxanide for Cryptosporidium and oral mesalamine and a prednisone taper for UC flare. He improved symptomatically, with less frequent cramping and bowel movements and more formed stools.
Discussion: This case resembles documented cases of cryptosporidiosis in IBD patients but is unique in that most other cases were in Crohn's patients [2-5,7-9]. Our patient's improvement on the three medications makes it difficult to definitively attribute the patient's symptoms to either cryptosporidiosis or UC flare. Combining nitazoxanide with immunosuppression has not worsened his disease severity, which is also reflected in literature [9]. It is possible, however, that nitazoxanide alone would have resolved his symptoms and obviated steroid use [3]. The decision whether to test for Cryptosporidium in suspected UC flare should be based on pre-test probability and type of testing available. As seen in our case, less sensitive tests like Giemsa and GMS staining may result in false negatives. Stool PCR is the gold standard for detecting Cryptosporidum. PCR does not depend on fecal oocyst shedding, unlike modified Ziehl-Neelsen acid fast stain, direct immunofluorescence antibody testing, and stool microscopy [1,6]. The weakness of stool PCR is that it also detects nonviable Cryptosporidium, and a positive test does not necessarily confirm an infectious cause of diarrhea. Lessons from this case include the importance of correct diagnosis to guide treatment, consideration of Cryptosporidium testing in cases of suspected UC flare, and the range of sensitivities among Cryptosporidium tests.

S2760

Twist and Shout: A Case Report of Twisted Pouch Syndrome

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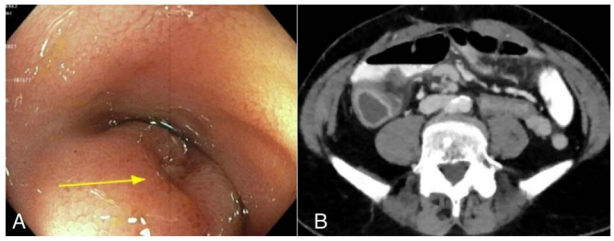
[1]LSUHSC, New Orleans, LA; [2]University Medical Center - LSUHSC, New Orleans, LA.

Introduction: Total proctocolectomy (TPC) with ileal pouch-anal anastomosis (IPAA) is recommended in the setting of medically refractory ulcerative colitis (UC). Following reanastomosis, complications can occur. We present a case of a patient who developed recurrent obstructive symptoms four years after IPAA. Imaging was concerning for a stricture in the pre-pouch ileum although no stricture was noted on pouchoscopy. Twisted pouch syndrome (TPS) was suspected.
Case Description/Methods: A 61-year-old male with refractory UC status post TPC with IPAA presented to clinic for acute nausea, constipation, and epigastric pressure. CTE revealed a distended stomach and small bowel with multiple air-fluid levels as well as narrowing and a transition point at the anastomosis and in the more proximal ileum. Endoscopy revealed few aphthous ulcers in distal pre-pouch ileum; the anastomosis was easily traversed and no stricture was found. Eight months later, the patient presented for 4 weeks of severe, worsening, diffuse abdominal pain associated with alternating diarrhea and constipation, decreased oral intake, nausea, and vomiting. CT re-demonstrated potential stricture proximal to pouch with dilation of the distal ileum and scattered areas of distal small bowel thickening. Pouchoscopy showed few patchy aphthous ulcers in the pre-pouch ileum with dilation, an angulated pouch inlet, and a large aphthous ulcer following the pouch inlet that caused narrowing but no stricture. He was ultimately diagnosed with TPS.
Discussion: TPS is caused by intraoperative misalignment of the ileal pouch and manifests as erratic bowel habits, unexplained abdominal or pelvic pain, and obstructive symptoms. Although malrotated and twisted pouches are known complications of IPAA, TPS was only recently named to describe this triad of symptoms that has proven difficult to diagnose pre-operatively. A retrospective review of Cleveland Clinic's Pouch Center registry of redo IPAA operative reports identified 29 cases of TPS with less than 25% of them diagnosed pre-operatively despite a thorough workup. Most cases were diagnosed intra-operatively and treated with redo surgery. This case is consistent with TPS, and the pouch ulceration and pouchitis seen could be due to mechanical stress and vascular insufficiency secondary to the twisting. More literature and awareness of TPS is needed to aid in proper diagnosis and management of these patients (Figure).



[2760] **Figure 1.** A: Narrowing caused by large ulcer in pre-pouch ileum B: Dilated distal ileum with wall thickening and segment of luminal narrowing proximal to pouch.

S2761

Crohn's Disease Presenting as Diffuse Granulomatous Mesenteric Adenitis

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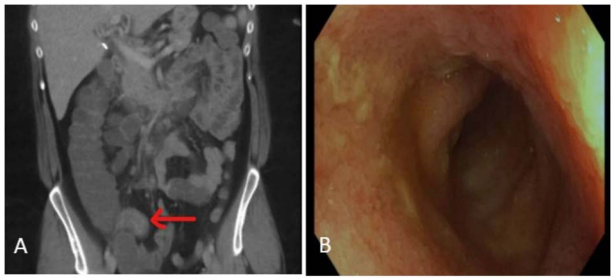
Introduction: Crohn's Disease (CD) is a chronic idiopathic inflammatory bowel disease with variable clinical and histologic manifestations. Microscopic findings include transmural inflammation and may show granuloma in a subset of patients. The impact of extraintestinal granulomatous inflammation in CD is not well understood. We present an atypical initial presentation of CD in the form of diffuse granulomatous mesenteric adenitis.
Case Description/Methods: A 31-year-old woman with ampiginous choroiditis presented with a month of diffuse abdominal pain and fever. Computed tomography (CT) of the abdomen/pelvis showed diffuse mesenteric lymph node enlargement with normal appearing bowels. Given her fevers, lymphadenopathy, mild leukocytosis, and elevation in inflammatory markers, thorough infectious and rheumatologic workups were pursued and unrevealing. Whole body positron emission tomography showed hypermetabolic mesenteric lymph nodes and terminal ileitis; subsequent colonoscopy noted inflamed, friable mucosa with biopsies showing active ileitis, ulceration, architectural distortion, and well-formed intramucosal granuloma consistent with Crohn's ileitis. CT-guided lymph node biopsy also showed granulomatous inflammation, making sarcoidosis a differential diagnosis. The patient was discharged in stable condition and followed at the outpatient gastroenterology clinic. Given uncertainty regarding the underlying diagnosis, she was trialed on 2 months of budesonide. MRE following treatment showed significantly improved inflammation of the terminal ileum with resolution of mesenteric lymphadenopathy.
Discussion: Mesenteric adenitis with terminal ileitis has been shown to occur in infectious ileitis, CD, and sarcoidosis. Rarely, CD can coexist with sarcoidosis. CD has transmural inflammation, with ulceration and granuloma formation, in contrast to intestinal sarcoidosis which only involves the mucosa. Granulomas outside the gastrointestinal tract favor the diagnosis of sarcoidosis but can still occur with CD. In CD, the location of granulomatous inflammation may play a role in predicting clinical course. The presence of mesenteric lymph node (MLN) granulomas has been associated with younger age, transmural inflammation, and postoperative disease recurrence risk. (Figure) Mesenteric granulomatous adenitis without intestinal involvement can be the initial presentation of CD, as noted in our patient. Prompt evaluation of competing diagnoses is warranted to ensure timely diagnosis and management.



[2761] **Figure 1.** A. Computed tomography showing mesenteric haziness and terminal ileitis (red arrow). B. Endoscopic findings of inflamed terminal ileum with congested, erythematous, and ulcerated mucosa.

S2762

Poor Bowel Preparation or Ileosigmoid Fistula: An Interesting Complication of Fistulizing Crohn's Disease

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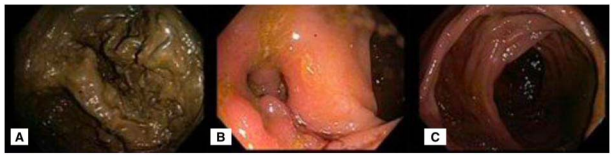
Introduction: Fistulas are a relatively common complication of severe Crohn's disease (CD), which affects up to 50% of patients. Fistula formation is believed to be secondary to bowel inflammation, leading to defects in the epithelial barrier. These defects can lead to penetration and breakdown of neighboring tissues, leading to the formation of a fistula. Fistulas are classically named relative to their anatomic location. Here, the authors present a patient with an interestingly located fistula, preventing successful bowel preparation for colonoscopy.
Case Description/Methods: A 29 year old Caucasian male presented to his gastroenterologist with loose stools for two months. He described occasionally noticing mucus in his bowel movements. He denied current abdominal pain, unintentional weight loss, and fecal incontinence. He also denied family history and previous diagnosis of inflammatory bowel disease. The patient underwent colonoscopy, for which he completed 24 hour bowel preparation. The colonoscopy was terminated early, as stool was seen throughout the entire colon. Patient then completed 48 hour bowel preparation in anticipation for a second colonoscopy. The second colonoscopy again revealed stool throughout the entire colon [A], however it was noted that the sigmoid and rectum had improved preparation, with what appeared to be a possible fistula located 20 cm from the anus [B, C]. Yellow liquid output was noted from the possible fistula. Biopsies obtained during colonoscopy revealed findings concerning for CD. The patient then underwent CT abdomen and pelvis with oral and IV contrast as well as MRI enterography, which revealed mural thickening and stricture of the terminal ileum and signs suggestive of an ileosigmoid fistula. The patient was then referred to colorectal surgery for bowel resection and fistulectomy. Ultimately, the patient had 17cm of the ileum and 10.5cm of the right colon resected. He was found to have an ileosigmoid fistula measuring 2.5cm, which was resected along with 10.5cm of the sigmoid and rectum. Postoperatively, patient was referred to an IBD comprehensive care center, where biologic therapy with infliximab was initiated. Patient has had complete resolution of his presenting symptoms and continues to tolerate therapy without complications. (Figure)
Discussion: The treatment for most fistulas require surgical resection along with medical therapy. When patients are in remission from CD, the likelihood of developing fistulas is significantly decreased compared to those not in remission.



[2762] **Figure 1.** A) Image obtained during colonoscopy demonstrating poor bowel preparation of the transverse colon. B) Image obtained during colonoscopy demonstrating fistula in the sigmoid colon. C) Image obtained during colonoscopy demonstrating good bowel preparation of the rectum.

S2763

Post-Transplant Lymphoproliferative Disorder Presenting as an Isolated Pre-Pouch Ileal Ulcer in a Liver Transplant Patient With Crohn's Disease

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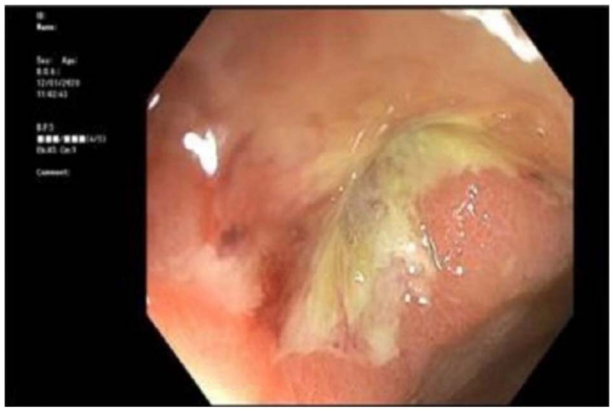
Scripps Clinic, La Jolla, CA.

Introduction: Post-transplant lymphoproliferative disorder (PTLD) can occur in solid organ and hematopoietic cell transplant recipients in the setting of chronic immunosuppression. It often results from Epstein-Barr virus (EBV) affected B-cell propagation. We present a case of PTLD in a liver transplant (LT) patient with Crohn's disease (CD) on biologic therapy.
Case Description/Methods: A 67-year-old male with primary sclerosing cholangitis (PSC) cirrhosis status post living donor LT in 2001 on tacrolimus, multiple skin cancers, recurrent PSC after transplant and pan-ulcerative colitis on sulfasalazine underwent total proctocolectomy with ileo-anal anastomosis in 2013 to 2014 for colonic dysplasia. In 2019, he was diagnosed with moderate-to-severe CD of the J-pouch and pre-pouch ileum, up to 50cm from the entry site. Vedolizumab (VDZ), an α4β7 integrin monoclonal antibody, was initiated with steroid-free clinical response on every four week dosing. Repeat pouchoscopy on VDZ showed pre-pouch ileitis up to 30cm and a large, isolated ulcer in the pre-pouch ileum, 10cm proximal to the ileitis (Figure). Biopsies revealed B-cell lymphoma, consistent with PTLD. Negative EBV-encoded RNA (EBER) in-situ hybridization suggested that this diagnosis was unrelated to EBV exposure. Positron emission tomography (PET) scan did not identify distant disease activity, and bone marrow biopsy was unremarkable. VDZ was stopped due to loss of response, budesonide resumed and R-CHOP chemotherapy (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisone) was subsequently initiated. Follow-up pouchoscopy showed lymphoma regression but persistent CD activity.
Discussion: PTLD typically presents as extra-nodal masses involving the central nervous system, lungs, gastrointestinal tract, liver, skin or allograft within one year of transplant. Immunosuppression reduction is the cornerstone of management; however, more aggressive cases, as in our patient, require systemic therapy. This case highlights a unique presentation of PTLD as an isolated ileal ulcer in a CD patient 19 years post-LT. Interestingly, the ulcer did not appear endoscopically distinct from CD-related ulceration. Furthermore, while malignancy is a potential risk of certain treatments for inflammatory bowel disease (IBD), our patient had never received thiopurines or anti-tumor necrosis factor (TNF) agents, and VDZ has not been associated with an increased risk of B-cell lymphoma. He is currently stable on low dose tacrolimus and budesonide.



[2763] **Figure 1.** Isolated pre-pouch ileal ulcer.

S2764

Racial and Ethnic Differences in Diagnosed Prevalence, Specialist Visits, and Treatment Utilization of Inflammatory Bowel Disease: Retrospective Analysis of U.S. Claims Data

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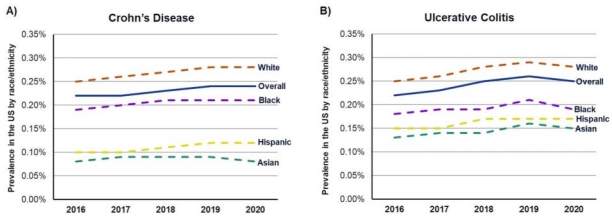
Introduction: Conflicting evidence exists regarding racial/ethnic disparities in the treatment and outcomes of Crohn's disease (CD) and ulcerative colitis (UC). This study assessed the racial/ethnic-specific differences in diagnosed prevalence and management of CD and UC among commercially insured patients (pts) in the US.
Case Description/Methods: Adults with CD or UC were identified from the Optum™ Clinical and Claims Database (2016–2020; 15–18 million annual beneficiaries). Diagnosed prevalence of CD and UC, proportion of pts with ≥1 gastroenterologist (GE) visit, excessive corticosteroid use (defined as ≥10 mg/day of prednisone equivalents for ≥60 consecutive days or one prescription of ≥600 mg prednisone per year), and use of any advanced therapy (AT) were assessed by race/ethnicity (White, Black, Asian, and Hispanic) and reported by year. Comparisons were made by Chi square tests.Between 2016–2020, overall diagnosed prevalence of CD and UC increased and was highest among White pts; Hispanic and Asian pts had the lowest diagnosed prevalence (Figure). Over time, GE visit rates declined for CD (Δ3%) and UC (Δ4%) pts and there were significant differences in the proportion of pts with an annual GE visit by race/ethnicity in 2020 among the CD (Asian: 75.5%; White: 69.8%; Black: 68.5%; Hispanic: 62.6%) and UC populations (Asian: 71.0%; White: 67.8%; Black: 69.1%; Hispanic: 61.5%). AT use increased over time (CD: Δ6%; UC: Δ5%) with almost twice as many CD pts (39.7%) receiving an AT compared to UC pts (21.1%). In 2020, significant differences were found for AT use by race race/ethnicity. Generally, fewer Hispanic (36.2% CD, 19.8% UC) and Black pts (37.4% CD, 19.1% UC) with CD or UC were prescribed AT vs White (40.2% CD, 21.5% UC) and Asian (42.4% CD, 22.3% UC) pts. Excessive corticosteroid use among pts with CD (12.1%) and UC (13.2%) decreased over time (Δ2%), with no significant differences by race/ethnicity.
Discussion: Among pts with commercial insurance (2016–2020), White pts had the highest diagnosed prevalence in the US, with fewer Black, Hispanic, and Asian pts diagnosed with IBD. Significant differences were observed for GE visits and AT use by race/ethnicity, especially in Hispanic populations. These findings may vary in populations with other/no insurance. The understanding of racial/ethnic differences in disease prevalence, treatment utilization, and access to care is a critical first step to ensuring appropriate access and improved outcomes for all pts.



[2764] **Figure 1.** Prevalence of Crohn's Disease and Ulcerative Colitis by Race/Ethnicity in the US from 2016—2020 White, Black, and Asian patients are non-Hispanic.

S2765

Rapid Development of Cervical Adenocarcinoma in a Young Woman With Crohn's Disease

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Introduction: Inflammatory bowel disease (IBD), further characterized into Crohn's disease or ulcerative colitis, is a chronic condition that involves immune-mediated inflammation and subsequent damage to the gastrointestinal tract. Treatment involves immunosuppression, increasing risk for infections and malignancies. Elevated cervical cancer rates are seen in these patients, and thus guidelines recommend annual cervical cancer screening in women receiving immunosuppressive therapy.
Case Description/Methods: A 46-year-old female with Crohn's disease (diagnosed at 18) presented with left lower quadrant pain and bloating. Her disease was steroid-refractory and did not respond to mesalamine, azathioprine, or adalimumab. She was in remission for four years on infliximab, however, it was discontinued after a spontaneous mediastinal abscess. She was later treated with vedolizumab and eventually ustekinumab. She had a history of recurrent infections with a negative primary immunodeficiency workup. Computed tomography (CT) abdomen/pelvis revealed two large pelvic masses. Surgical pathology confirmed stage IVA cervical adenocarcinoma, human papillomavirus (HPV) independent, with involvement of the bilateral ovaries and fallopian tubes. CT abdomen/pelvis and Papanicolau smear with HPV co-testing performed less than a year prior to her cancer diagnosis were negative for evidence of malignancy.
Discussion: Human papillomavirus (HPV) is the most common cause of cervical cancer. It has been hypothesized that HPV underlies the elevated cervical cancer risk in immunosuppressed patients. This case is notable as it involves an HPV-independent cervical cancer, found at an advanced stage, in a relatively young patient on immunosuppression. To the best of our knowledge, no similar reports have been described in the literature. Liquid based cytology pap smear and high risk HPV cotesting have demonstrated high sensitivity for cervical cancer screening. HPV-negative cervical cancers comprise only a small proportion of cervical neoplasms and are almost entirely adenocarcinomas. These cancers are often diagnosed at an advanced stage. ACG guidelines currently recommend annual screening for patients on immunosuppressive therapy. As in the case we have described, immunosuppressed patients can still develop advanced cancers between screening intervals. When caring for immunosuppressed IBD patients, there should be a low threshold for additional evaluation if patients develop signs or symptoms concerning for underlying malignancy.

S2766

Purpura Fulminans in Acute Severe Ulcerative Colitis Successfully Treated With Infliximab

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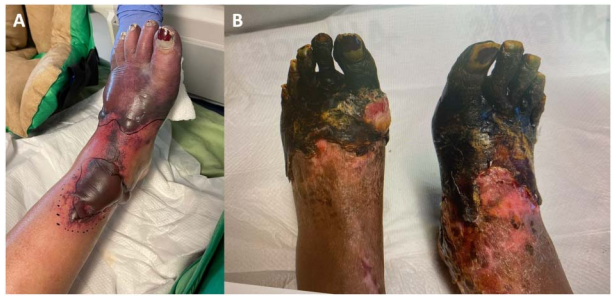
Introduction: Several extra-intestinal dermatological manifestations can be seen in patients with ulcerative colitis (UC). We report a rare case of purpura fulminans in the setting of acute, severe UC (ASUC). A few reports have shown improvement of this entity only with colectomy. We describe a case of purpura fulminans that developed in the setting of ASUC that responded with infliximab (IFX) therapy.
Case Description/Methods: A 50-year-old Female with mild pan-UC and no previous dermatologic morbidity managed with oral mesalamine therapy for 18 months developed exacerbation of symptoms. Colonoscopy reveled moderate pancolitis (Endoscopic Mayo 2). She was started on prednisone and vedolizumab but after a partial response, lost response and developed worsening gastrointestinal (GI) symptoms and presented with vesiculated, hemorrhagic bullae involving both feet, left arm and back (FigureA). White blood cell count on admission was 35,700, International normalized ratio (INR) 1.7, C-reaction protein (CRP) 227 mg/L and fibrinogen 129 (mg/dl). Skin biopsy showed microthrombi but no pus. Patient was started on corticosteroids, with mild improvement in GI symptoms but worsening skin lesions. Given case reports of purpura fulminans resolving with colectomy, the procedure was offered but declined by the patient. She was started on IFX (10 mg/Kg). Her GI symptoms improved and her skin lesions stabilized. After discharge, the skin lesions on her back and arm healed, but both feet developed skin necrosis and dry gangrene, requiring a bilateral below the knee amputations (FigureB). After 14 weeks of IFX therapy, the patient is in clinical remission, normalized CRP and only with a limited area of mucosal inflammation in the sigmoid on colonoscopy.
Discussion: To our knowledge, this is the first case of purpura fulminans in association with ASUC that responded to infliximab. While the patient required amputation, therapy with infliximab slowed the progression of her disease, limiting the areas of necrosis and potentially avoiding sepsis. Pupura fulminans is characterized by skin necrosis with thrombosis in the dermal vessels and consumptive coagulopathy. Limb ischemia is a devastating complication and amputation may be necessary to reduce mortality. In conclusion, patients with ASUC that develop purpura fulminans may benefit of early and aggressive medical therapy with IFX, sparing the need for colectomy.



[2766] **Figure 1.** Purpura fulminant at presentation and follow-up.

S2767

Rapid Recurrence of Stroke After Tofacitinib Initiation: Composite Outcomes Challenge Informed Decision-Making in Ulcerative Colitis Management

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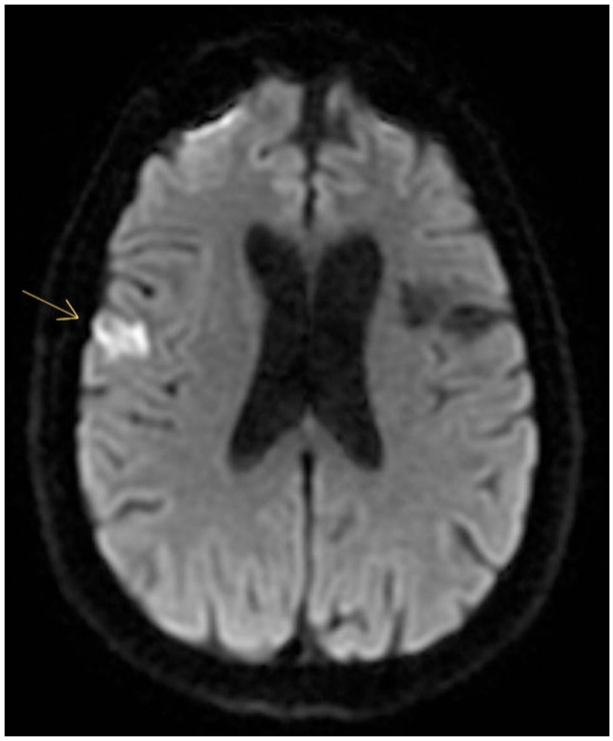
Introduction: Tofacitinib (Xeljanz) is an oral small molecule Janus kinase (JAK) inhibitor approved for the treatment of ulcerative colitis with incomplete response or intolerance to tumor necrosis factor (TNF) inhibitors. Since fall 2021 in the United States and Canada, tofacitinib carries a boxed warning for major adverse cardiovascular events (MACE) based on randomized, open-label study of cardiovascular risk-enriched adults. We present a case of recurrent stroke within one week of tofacitinib initiation in a patient with ulcerative colitis.

Case Description/Methods: A 59-year-old man with left-sided ulcerative colitis presented with acute-onset left hand weakness, numbness, facial droop, and slurred speech. He had a remote 4-pack year tobacco history and left-sided ischemic stroke 3 years ago in the setting of cocaine use. At that time, workup was unrevealing with normal cardiac function and no hyperlipidemia. He since reported complete abstinence from cocaine and continued on a statin and aspirin. His ulcerative colitis was diagnosed 8 months prior to presentation. He required multiple hospitalizations with inadequate response to oral mesalamine and intermittent intravenous steroids. He switched to infliximab but rapidly developed high anti-drug antibody titers. He started tofacitinib 10mg twice daily due to strong patient preference for an oral agent and concerns of developing antibodies against additional biologics. Five days after initiation, he presented with the neurologic symptoms above, which were mild and did not require tPA or thrombectomy. Computed tomography and magnetic resonance imaging revealed acute ischemic stroke in the posterior right frontal lobe. Low-density lipoprotein level was 40mg/dL; urine drug screen was negative. Expanded workup including hypercoagulability labs, echocardiogram, and 30-day cardiac loop monitor did not suggest a specific stroke etiology. He transitioned to ustekinumab. (Figure)
Discussion: While tofacitinib has shown elevated MACE risk compared to TNF inhibitors in rheumatoid arthritis, no studies have yet examined these outcomes in ulcerative colitis or parsed risk of stroke from composite cardiovascular events. This case highlights the rapidity with which stroke can occur after tofacitinib initiation in ulcerative colitis in a patient with underlying risk factors. Non-composite outcome data are essential to guide shared decisionmaking using patient-specific risk factors. Evolving safety profiles must be carefully balanced against patient preferences for oral therapies.



[2767] **Figure 1:** Recurrent acute ischemic stroke within one week of tofacitinib initiation. Magnetic resonance imaging reveals a focus of acute restricted diffusion (approximately 1.4 x 1.8 cm) within the posterior right frontal lobe (middle cerebral artery territory).

S2768

Secukinumab-Induced Crohn's Disease Complicated by Hemorrhagic Shock in a Patient Undergoing Treatment for Chronic Plaque Psoriasis

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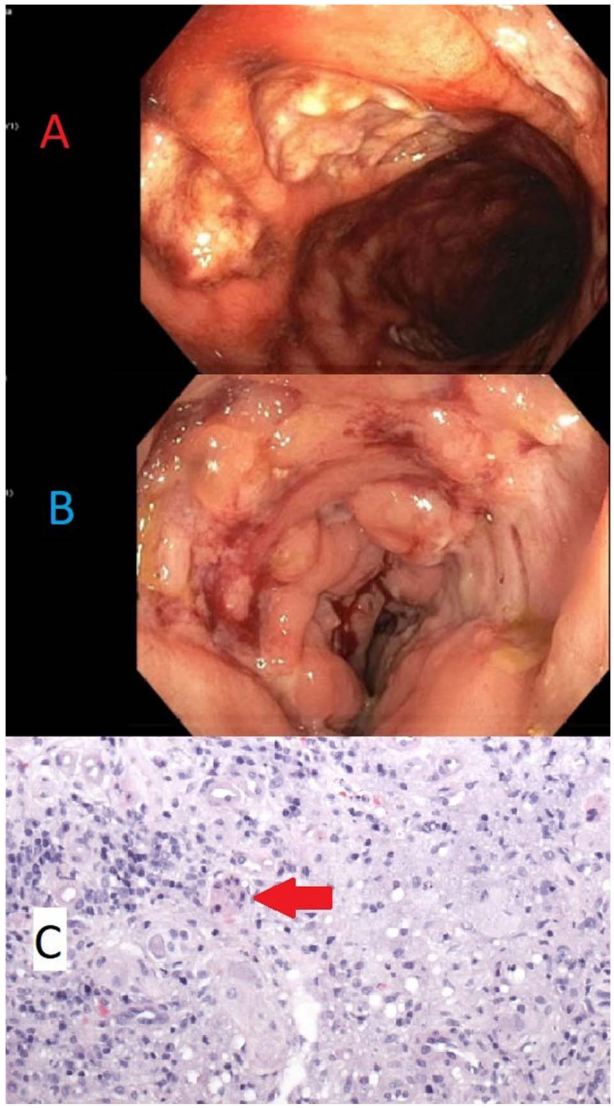
Introduction: Secukinumab is a human monoclonal antibody which inhibits the proinflammatory cytokine interleukin-17A (IL-17A). It is used to treat chronic plaque psoriasis, ankylosing spondylitis, and psoriatic arthritis. Over the past several years, it has been increasingly linked to exacerbations of pre-existing inflammatory bowel disease (IBD) as well as development of new onset IBD, including both ulcerative colitis and Crohn's disease (CD). We present an 83-year-old patient on Secukinumab for psoriasis who presented with chronic diarrhea complicated by GI hemorrhage and was diagnosed with new onset CD.
Case Description/Methods: An 83-year-old male with a past medical history of CAD, CKD and psoriasis presented with four weeks of diarrhea. He denied recent antibiotic use, travel, sick contacts or history of IBD, however endorsed initiation of Secukinumab prior to symptom onset. He reported distant ileocecectomy twenty years prior for unknown reasons. Labs remarkable for iron deficiency anemia (iron sat 3%), CRP 86 mg/dl and fecal calprotectin 1860 ug/g. CT scan revealed new ileal wall thickening with a normal appearing colon. Colonoscopy showed deep ulcers in the rectum and terminal ileum associated with mucus and friable mucosa. Biopsies revealed severe active ileitis with ulceration and rare epithelioid granulomas concerning for CD. He was started on high dose IV steroids but continued to have worsening diarrhea for 7 days. His course was further complicated by large volume hematochezia, hemorrhagic shock requiring 15 units of packed red blood cells, and acute kidney injury. Repeat colonoscopies demonstrated deep rectal ulcerations and oozing from the ileum. He was started on IV Remicade due to refractory symptoms but ultimately had significant clinical improvement and was discharged. (Figure)
Discussion: There have been several case reports of Secukinumab-induced IBD. The exact mechanism is unknown but may involve shunting of the immunologic pathway from blockade of IL-17 which results in increased stimulation of an alternative pathway. It remains unclear whether new onset IBD associated with Secukinumab is a chronic condition or resolves with discontinuation of Secukinumab. This case demonstrates Secukinumab-induced CD and is the first case report of severe GI hemorrhage requiring massive transfusion protocol. When starting patients on Secukinumab therapy, it is important to advise them of the potential complication of new onset IBD and the complications associated with IBD including intestinal hemorrhage.



[2768] **Figure 1.** A. Large, nonbleeding deep ulcerations in rectum with surrounding friable mucosa B. Oozing terminal ileum ulcerations with associated mucus and friable mucosa C. Chronic, active granulomatous inflammation with a cluster of histiocytes surrounded by lymphocytes and plasma cells (indicated by red arrow).

S2769

Salmonella Saintpaul Colitis Mimicking Crohn's Disease

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Introduction: Salmonella are classically associated with gastroenteritis. However, Salmonella may infect the colon, potentially causing an inflammatory bowel disease (IBD) misdiagnosis. Our case presents a patient with endoscopic findings suggestive of Crohn's disease but stool cultures positive for Salmonella Saintpaul. She had persistent disease resolution with a short course of prednisone and ciprofloxacin.
Case Description/Methods: A 22-year-old woman presented with a six-week history of abdominal pain and bloody diarrhea, along with nocturnal stooling, tenesmus, and subjective fevers. She denied recent sick contacts or personal or family history of IBD. Laboratory findings included a normal white count, mild microcytic anemia, and elevated C-reactive protein and fecal calprotectin. A colonoscopy revealed patchy inflammation in the terminal ileum and transverse colon extending to the rectum with scattered serpiginous ulcers. Histologic findings included moderate to severe active colitis throughout the colon, lacking chronic features. Stool culture grew Salmonella Saintpaul; other infectious stool studies were negative. Based on initial endoscopic findings, she was diagnosed with Crohn's disease. The lack of histologic chronic features of inflammation was attributed to evolving disease. She was started on prednisone taper and a two-week course of ciprofloxacin. Her symptoms rapidly resolved. Initially, it was planned to start vedolizumab. However, repeat fecal calprotectin and later colonoscopy showed complete biochemical, endoscopic, and histologic remission. She remains asymptomatic 2 years later.
Discussion: Our patient's history of a sub-acute bloody diarrhea with positive stool culture with complete disease resolution after short courses of prednisone and ciprofloxacin supports the diagnosis of Salmonella Saintpaul colitis mimicking Crohn's disease. There have been other reports of Salmonella species mimicking Crohn's disease, although with nonbloody diarrhea. To our knowledge, this is the first reported case of Salmonella Saintpaul mimicking Crohn's disease. This case also presents an important treatment consideration. Based on her presumed good response to corticosteroids, vedolizumab was considered. Fortunately, her improved symptoms prompted a repeat colonoscopy showing disease resolution, sparing her from biologic treatment. Careful consideration of potential IBD mimickers and clinical presentation should be given before starting long term treatment.

S2770

Recurrent Salmonella Associated With Relapse of Inflammatory Bowel Disease

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Introduction: Inflammatory bowel disease (IBD) includes ulcerative colitis and Crohn's disease with a clinical course comprising of multiple relapses and remissions. While numerous studies have associated clostridium difficile in IBD relapse with a prevalence of 16%, there is not much literature about the role of recurrent salmonella infection in this population.
Case Description/Methods: A 43-year-old female with history of Crohn's disease, small bowel obstruction and multiple episodes of salmonella enteritis, presented to the hospital with persistent abdominal pain, nausea, and vomiting. Physical examination showed generalized abdominal tenderness with normal bowel sounds. A CT abdomen and pelvis revealed dilated mid jejunal loops without hyperemia, consistent with partial small bowel obstruction. Due to concerns of Crohn's relapse, a stool PCR was ordered which was positive of salmonella. Patient as started on a fourteen-day course of cefpodoxime and was given a gastrografin challenge that relieved the obstruction as KUB after 6 hours showed contrast in the colon and patient had large bowel movements. Patient was also started on ustekinumab as she previously failed adalimumab and infliximab-abda due to formation of antibodies and recurrent salmonella enteritis. With improvement in symptoms, she was discharged with an outpatient follow up.
Discussion: Relapse of inflammatory bowel disease is described in association with various micro-organisms including campylobacter, clostridium difficile (C-difficile), shigella and salmonella. Salmonella is a facultative gram-negative anaerobic bacillus that enters the body through gastrointestinal tract and can cause various infections including enteric fever, gastroenteritis, osteomyelitis, and abscesses. Unlike C-difficile infection, very little is known about the role of recurrent salmonella in an IBD relapse. Our patient is one of the few cases with multiple relapses of Crohn's disease due to recurrent salmonella. In case of a relapse, it is important to send stool studies early in the disease as it may prevent the unwarranted use of immunosuppressive medications and/or steroids and treating underlying infection would help fasten the recovery time. Also, it has been suggested that patients infected with non-C. Difficile infections remain in remission longer than to those infected with C. Difficile itself. With salmonella and IBD relapse, antibiotics are helpful in severe cases, but more research should be done to establish definite guidelines.

S2771

Saddle PE in an IBD Patient

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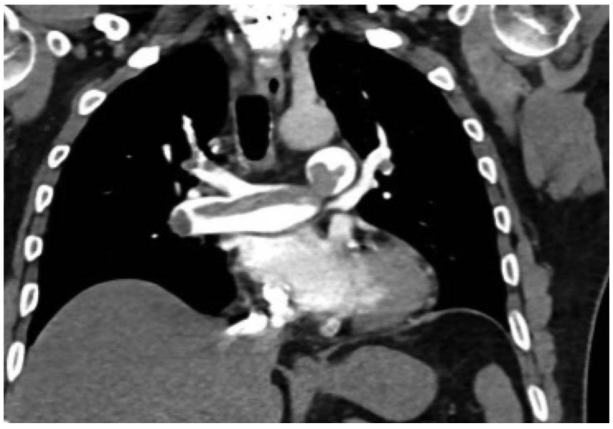
Introduction: Inflammatory bowel disease patients are at an eight-fold increased risk for venous thromboembolism (VTE) due to the systemic inflammatory nature of this disease state. VTE in IBD is associated with significant morbidity and mortality. Despite this increased risk, adherence to pharmacologic prophylaxis for VTE appears to be low.
Case Description/Methods: A 56-year-old Cuban male with past medical history notable for ulcerative pancolitis, hypertension, and type 2 diabetes presented to the emergency department for worsening hematochezia. He reported six bloody bowel movements per day, accompanied by fecal urgency and nocturnal diarrhea. Upon admission, he denied shortness of breath, chest pain, fevers, and chills. Laboratory studies were notable for CRP 1.2 mg/dL (ULN of 0.5 mg/dL). Infectious work up, including *Clostridium difficile* stool-based testing, was unremarkable. Flexible sigmoidoscopy revealed a diffuse area of moderately friable mucosa without bleeding and superficial ulcerations, consistent with Mayo 2 activity. Treatment was subsequently initiated with intravenous methylprednisolone. He received enoxaparin injection for VTE prophylaxis. Over the course of two days, the patient improved and was discharged home. As he was leaving the hospital, the patient reported sudden-onset chest pain and a near syncopal episode while standing in the hospital elevator. Work up with a CT angiography of the chest demonstrated a large, saddle pulmonary embolism with right heart strain. Labs revealed an elevated BNP and troponin elevation. He was subsequently admitted to the intensive care unit for catheter-directed thrombolysis and heparin infusion. His respiratory condition improved. He remained hemodynamically stable and was ultimately discharged on apixaban. (Figure)
Discussion: This case highlights the importance of VTE prophylaxis in all hospitalized IBD patients. Despite receiving VTE prophylaxis, the patient developed a saddle pulmonary embolism with right heart strain on the day of discharge. It also begs the question of whether or not IBD patients with high VTE risk would benefit from post-discharge VTE prophylaxis. Despite this clear association, VTE prophylaxis is underutilized in this population.



[2771] **Figure 1.** Large saddle embolism at the bifurcation of the pulmonary artery

S2772

Subcutaneous Sweet Syndrome Successfully Treated With Ustekinumab in Patient With Ulcerative Colitis

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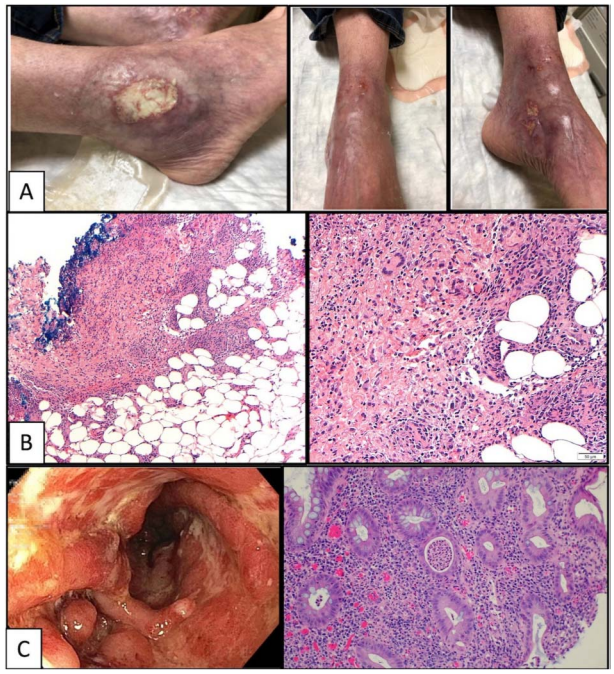
Introduction: Extraintestinal manifestations (EIMs) of inflammatory bowel disease (IBD) are well-established. Sweet syndrome (SS), or acute febrile neutrophilic dermatosis, is a reactive mucocutaneous manifestation of IBD presenting as erythematous papules/plauqes with associated fever and arthomyalgias. There is limited evidence regarding efficacy of Ustekinumab in management of EIMs of UC, particularly SS.
Case Description/Methods: The patient is a 50-year-old woman with left-sided UC (Montreal classification E2) that previously failed several therapies, including mesalamine, azathioprine, infliximab, adalimumab, vedolizumab, and a fecal microbiota transplant trial. She presented with worsening abdominal pain, diarrhea/hematochezia, and bilateral lower extremity pain. She was febrile and tachycardic with tender, violaceous, and ulcerated subcutaneous nodules on the bilateral ankles with hemorrhagic bullae (FigureA). Labs revealed negative *C. diff,* elevated ESR/CRP, thrombocytosis, and borderline leukocytosis with neutrophilic predominance. Lower extremity MR imaging and bone biopsy revealed multifocal sterile osteomyelitis with adjacent abscess; skin biopsy demonstrated dense granulomatous/neutrophilic infiltrate in the deep dermis/subcutis without microorganisms, consistent with subcutaneous SS (FigureB). A restaging colonoscopy demonstrated severe proctosigmoid ulcerative colitis (FigureC). Given that the patient had failed several immunomodulators and biologic therapies, she was started on prednisone and Ustekinumab. Four months later, she reported complete resolution of her cutaneous SS off steroids and improving UC symptoms (less frequent and more formed stools, minimal hematochezia). Repeat MRI demonstrated resolution of the sterile osteomyelitis and abscess.
Discussion: Our case highlights the novel use of Ustekinumab in the treatment of subcutaneous SS with sterile osteomyelitis in a patient with flaring UC. SS is a neutrophilic dermatosis that is a rare EIM of IBD, classically characterized by tender cutaneous lesions. There is limited evidence supporting the use of Ustekinumab in treating EIMs of CD, and a lack of data regarding its efficacy in treating EIMs of UC. Our case fills a major gap in the literature and highlights the clinical efficacy of Ustekinumab for SS and UC especially in patients that have a contraindication to, failed previous treatment with, or otherwise cannot tolerate corticosteroids and TNF-alpha antagonists.



[2772] **Figure 1.** 1A. Right lateral malleolus with 2.5 cm shallow erosion with slightly violaceous borders and central bright yellow fibrinous debris. There was slight atrophy of surrounding skin with mild edema and hyperpigmentation (left image). Left medial malleolus/dorsal foot with grouped irregular shallow ulcers with surrounding mild violaceous erythema (middle and right image). 1B. Left ankle biopsies showed mixed septal and lobular panniculitis with granulomatous and neutrophilic inflammation. Histologic sections show a mildly spongiotic epidermis with dense granulomatous and neutrophilic inflammatory infiltrate in the deep dermis and subcutis (left image). The inflammatory infiltrate, which consists of prominent neutrophils, histiocytes, and scattered lymphocytes, surrounds vascular and adnexal structures, as well as adipocyte lobules. Definitive features of vasculitis are not seen. PASd (periodic acid-Schiff-diastase), GMS (Grocott's methenamine silver), Gram, and Fite staining fail to highlight microorganisms (right image). 1C. Colonoscopy demonstrated severe (Mayo Endoscopy Score 3) proctosigmoid ulcerative colitis to 30 cm (left image). Sigmoid biopsies showed significant immune cell infiltration with crypt architectural distortion concerning for severe chronic active colitis. No evidence of granulomas, dysplasia or cytomegalovirus (right image).

S2773

Successful Treatment of Complicated Ulcerative Colitis With Oral Vancomycin in a Patient With Primary Sclerosing Cholangitis

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Introduction: Ulcerative colitis with primary sclerosing cholangitis (UC-PSC) is associated with earlier age of onset and pancolitis, and is thought to be a distinct entity. Current therapeutic approaches to patients with UC-PSC are similar to patients with UC alone. Oral vancomycin has been shown to have therapeutic effects on colitis in patients with UC-PSC. We present a complicated case of UC-PSC that was successfully treated with oral vancomycin.
Case Description/Methods: A 28 year-old African-American male with a 2 year history of UC-PSC was referred to our inpatient service for severe UC (Mayo score 11) as well as night sweats, weight loss, and severe peripheral polyarthritis. He had previously failed adalimumab, azathioprine, and infliximab-dyyb. At the time of presentation, he had been on vedolizumab for 7 months, as well as amphotericin B and fluconazole for disseminated coccidiomycosis involving his lungs, skin, eyes and other organs. Stool pathogen panel was negative, and flexible sigmoidoscopy demonstrated Mayo 2 colitis. He had severe arthritis in both knees, along with less severe arthritis in other peripheral joints, and was unable to ambulate because of this. Synovial fluid aspirate of the knee was suggestive of inflammatory arthritis, though his coccidioides antigen was positive. Given the desire to avoid further immunosuppression with IV steroids, he was started on oral vancomycin 500 mg twice daily. Within 24 hours, he began to note improvement in all symptoms and within 7 days, his partial Mayo score was 0, and he was ambulating with minimal pain. Six months later, he has regained 15 pounds and remains in clinical remission of his colitis on oral vancomycin and vedolizumab, as well as antifungals and ursodiol. His alkaline phosphatase remains elevated and his MRCP continues to show intrahepatic PSC.
Discussion: Numerous case reports have described the benefit of oral vancomycin in patients with UC-PSC in both adult and pediatric patients. This case adds to that body of evidence, and also highlights the need for safe, effective agents for inflammatory bowel disease that can be used in patients without concern of activating or exacerbating infections such as tuberculosis, hepatitis B, or in the case of our patient, disseminated coccidiomycosis.

S2774

Sweet Syndrome as One of the Manifesting Symptoms of Inflammatory Bowel Disease

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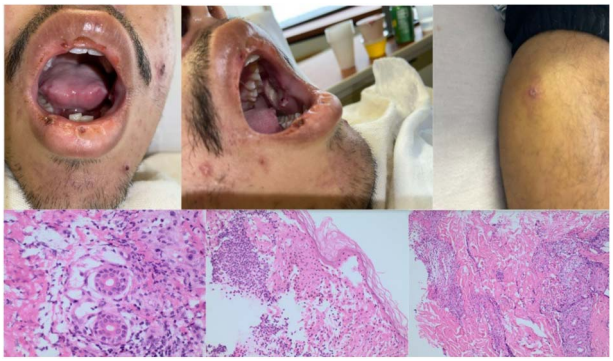
Introduction: Sweet's syndrome (SS), a subtype of neutrophilic dermatosis (ND), is an uncommon skin disorder characterized by the abrupt appearance of painful erythematous skin lesions, fever, and neutrophilia. Diagnosis of SS is made via biopsy showing a dense neutrophilic infiltrate of the dermis and epidermal sparing. SS is associated with hematologic malignancies or drug reactions and less commonly with inflammatory bowel disease (IBD). Treatment of SS, and other NDs, mirrors treatment of the underlying condition and is typically steroid responsive. Identification is important as SS is an extra systemic manifestation of underlying disease and indicates a poor prognosis. We present an 18 year old male with SS as a manifesting symptom of IBD.
Case Description/Methods: An 18 year old male presented with 1 month of abdominal pain, oral ulcerations, hematochezia, and a left lower extremity lesion. He had a diffusely tender abdomen, multiple ulcers bilaterally on his buccal mucosa, cheilitis, and a 1 cm ulcerated lesion on his left leg. He was febrile and blood tests revealed anemia, thrombocytosis, neutrophilia, elevated inflammatory markers, and a positive C-ANCA. His leg and oral lesions were biopsied as well as a cratered esophageal ulcer found during endoscopy. Sigmoidoscopy demonstrated a circular ulceration of the anal mucosa and severe patchy inflammation in the descending and sigmoid colon. He was started on methylprednisolone for empiric treatment of presumed IBD. The skin biopsy showed ND with an interstitial and perivascular inflammatory infiltrate with epidermal necrosis without vasculitis most consistent with SS. He was diagnosed with Crohn's Disease and has seen improvement of his skin lesions, oral lesions, and abdominal symptoms after a prolonged steroid taper. (Figure)
Discussion: While NDs are well described in association with IBD, SS is not a subtype of ND that commonly occurs with less than 100 cases described. Biopsy is the definitive diagnostic study and should be done promptly as ND's differential includes drug-reaction, malignancy, and the skin lesions may appear similar to infectious lesions. The two former conditions will respond to treatment though may relapse if not identified, and the latter will be exacerbated by immunosuppression. For Physicians treating IBD, knowledge of the appearance of ND can ensure prompt biopsy and initiation, or withdrawal, of appropriate therapies.



[2774] **Figure 1.** Top Row: Mucocutaneous findings in the Mouth and Left Lower Extremity Bottom Row: Perivascular mixed inflammatory infiltrate primarily composed of neutrophils with a few eosinophils present with no evidence of vasculitis. The infiltrate is primarily limited to the dermis.

S2775

The Use of IVIG in a Patient With Uncontrolled Crohn's Disease Being Treated for Bacteremia

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Introduction: Medically refractory Crohn's Disease (CD) in a patient with multiple comorbidities can be a frustrating course for both patient's and physicians. This is a case report of a patient with uncontrolled CD and bacteremia from gut translocation who was treated with IVIG with some improvement in his subjective symptoms and laboratory markers of CD flare.
Case Description/Methods: This is a 24 year old patient who was diagnosed with CD via biopsy at age 17. He had been intermittently on infliximab, ustekinumab and certolizumab but had issues with insurance and transportation and had not been on any biologic therapy in the last 2 months. He was seen in the ED and discharged on oral antibiotics and was admitted after blood cultures from this visit were positive for gram negative rods, eventually speciating to Bacillis cereus and Mixta calida. He was treated initially with broad spectrum antibiotics for bacteremia with suspected source of gut translocation. Based on his worsening GI symptoms abdominal imaging and labs (CRP 111 (normal under 8) and fecal calprotectin >3000 (normal under 49), he was also diagnosed with a flare of his CD. IVIG was initiated on hospital day 3 since steroids and biologics couldn't be used in acute infection. He received 3 doses of IVIG and finished his course of IV antibiotics for bacteremia and had some improvement in his subjective symptoms as well as lab results (CRP 58 and fecal calprotectin 1640). Several weeks after the resolution of his acute infection, steroids and then ustekinumab were restarted to achieve better long-term control of his CD.
Discussion: While IVIG is not a frequently used treatment for uncontrolled CD, in certain circumstances, it can be beneficial, especially when other treatment options are contraindicated due to active infection. It has not been found to be effective in IBD with recurrent Clostridium difficile infection, but in cases of other severe bacterial and fungal infections, it can be successfully and safely used for the short-term management of IBD. Up to 80% of patients in small studies using IVIG had some response or remission to IVIG, so while it is an expensive option, it may be worthwhile in patients with severe disease and contraindications to typically used immunosuppressants.

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S2776

Syphilitic Proctitis Mimicking Ulcerative Colitis

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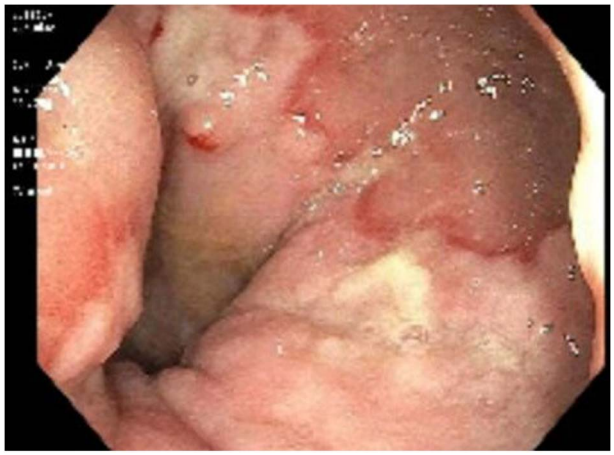
Introduction: The incidence of syphilis has increased in the past few decades in the U.S.A and it has mainly affected men who have sex with men (MSM). Syphilis may affect various organ systems like skin, genitals, and central nervous system and rarely has gastrointestinal manifestations like proctitis. Both infectious and noninfectious causes can lead to proctitis. Syphilitic proctitis is a rare clinical entity but is being reported more frequently, particularly among MSM. It generally has delayed diagnosis as it might be asymptomatic or may present with symptoms that may overlap with other disorders like inflammatory bowel disease, and nonsteroidal anti-inflammatory drug enteropathy. We report a case of syphilitic proctitis which presented with rectal pain and ulceration mimicking ulcerative colitis.
Case Description/Methods: A 26-year-old man presented with on and off blood in the stools and tenesmus for a year. He identified as homosexual and denied any complaints. A digital rectal and abdominal examination was benign. His rapid plasma reagin and Treponema antibodies were positive; screening for human immunodeficiency virus and other sexually transmitted diseases was negative. A colonoscopy revealed diffuse, friable mucosal swelling, and ulceration in the rectum (Figure). Immunostaining of the rectal biopsy sample revealed many intra- and extracellular T. pallidum in the lamina propria. The patient received weekly intramuscular injections of benzylpenicillin for 3 weeks. The clinical symptoms improved and a repeat colonoscopy in 6 months after treatment, showed resolution of the proctitis.
Discussion: Syphilis infections in atypical areas are often asymptomatic and relatively challenging to diagnose and should be considered in high-risk patients. Diagnosis requires a detailed history and a physical examination however, distinguishing between the other causes of proctitis will require a colonoscopy and tissue biopsy. Patients present with hematochezia, urgency, diarrhea, or constipation, and the endoscopic appearance of the rectal area may include features similar to inflammatory bowel disease.



[2776] **Figure 1.** Endoscopic image of redness and ulceration in the rectum.

S2777

Vedolizumab-Induced Reversible Lymphoproliferative Disorder in a Patient With Ulcerative Colitis

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Introduction: Vedolizumab is a monoclonal antibody used in ulcerative colitis and Crohn's disease, targeting the α4β7 integrin receptor on T lymphocytes. Lymphoproliferative reactions have not been reported with Vedolizumab. We report a case of reversible T-cell lymphoproliferative disorder in a patient on vedolizumab.
Case Description/Methods: A 44-year-old female presented in 2013 with bloody diarrhea and was diagnosed with ulcerative colitis (unclear extent). She was treated with mesalamine and then later with adalimumab. She had a secondary loss of response to adalimumab and was switched to vedolizumab in 2020. After the first vedolizumab infusion, she developed a pruritic skin rash that briefly improved with a course of prednisone. After completing the third infusion, the rash recurred along with symptoms of intense fatigue, joint pain, nausea, and vomiting. She had no fevers, chills, or night sweats. Labs showed a new leukocytosis (15,000/microliter) with significant elevation in lymphocytes (66% absolute lymphocyte count). Peripheral blood smear showed 10% atypical lymphocytes and LDH was elevated. A CT abdomen with contrast showed small lymph nodes in the perirectal area and splenomegaly of 17 cm. Findings were concerning a lymphoproliferative disorder and the patient was referred to hematology. Testing for EBV and CMV were negative. Peripheral blood flow cytometry was negative for tumor markers (negative CD7, CD16, and CD57) and bone marrow biopsy showed a normocellular bone marrow. Despite a thorough work-up, no other etiology for this lymphoproliferative disorder was found. Since there was a temporal relationship between the onset of systemic symptoms and the start of vedolizumab, vedolizumab was discontinued. Her systemic symptoms significantly improved within a few weeks of therapy cessation. Her lymphocytosis improved and resolved within 2 months. Repeat CT-scan at 3 months showed significant regression in spleen and lymph node size. The patient was subsequently started on infliximab monotherapy for her ulcerative colitis.
Discussion: The enhanced risk of lymphoproliferative disorders in patients with inflammatory bowel disease on anti-TNFα agents is well documented. This phenomenon has not been reported with novel biologic therapies, such as vedolizumab. To our knowledge, this is the first case of vedolizumab-induced reversible lymphoproliferative disorder and highlights the importance of routine blood cell count monitoring while on this therapy.

S2778

Ulcerative Colitis and Concomitant Pulmonary Sarcoidosis Leading to Colectomy: A Case Series

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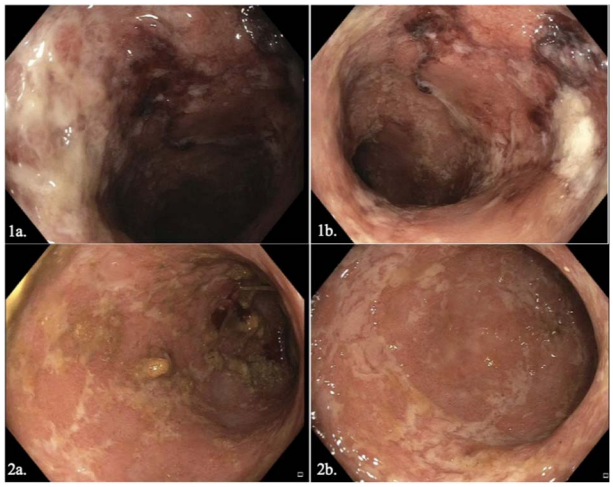
Introduction: A recent analysis of 24 cases of ulcerative colitis (UC) with concomitant sarcoidosis found a common HLA serotype (Toshiyuki 2021), however its role in disease severity is unknown. We describe 2 pulmonary sarcoidosis patients with rapidly progressing refractory UC needing colectomy.
Case Description/Methods: A 45-year-old male presented with 15-20 episodes of hematochezia a day with nocturnal bowel movements. He was diagnosed with UC and started on mesalamine and vedolizumab. He did not respond and was switched to multiple biologics including ustekinumab, adalimumab and infliximab. He ultimately underwent total colectomy within 1 year of diagnosis. He was diagnosed with pulmonary sarcoidosis 10 years prior, presenting with weight loss and chest pain. Prior to his UC diagnosis, he was not taking steroids for his pulmonary disease. His annual pulmonary function tests had been normal. A 52-year-old female presented with 3 months of hematochezia and anemia. She was treated for gastroenteritis but was hospitalized due to minimal improvement. Imaging, endoscopy, and histology confirmed colitis, thought to be Crohn's disease (CD) but later reclassified as UC. She was started on infliximab but was a primary non-responder. After 1 year of therapy she was switched to vedolizumab but received 3 doses before switching to ustekinumab. Soon after induction, her symptoms warranted hospitalization, and colectomy was performed 3 years after diagnosis. She was diagnosed with pulmonary sarcoidosis 3 years prior to her UC diagnosis and had been on daily low-dose prednisone since then. (Figure)
Discussion: Our patients were diagnosed with sarcoidosis well before their UC and had rapidly progressing disease despite biologic therapy requiring colectomy. Most studies address the link between CD and sarcoidosis. Increased CD4/CD8 ratios are specific for sarcoidosis with similar expansion of T cell subsets in patients with CD. Both have been observed more often among siblings and monozygotic twins suggesting a genetic component. A similar analysis has not been performed in UC patients. To date, there is only one case that found specific HLA serotypes associated with both UC and sarcoidosis. In addition, sarcoidosis was thought to lead to less penetrative disease and fewer colectomies. This contrasts with the cases presented here, which both progressed to colectomy within 3 years of diagnosis. Thus, more studies need to be conducted in patients with UC and sarcoidosis to further elucidate the prognosis and potential complications.



[2778] **Figure 1.** Diffuse severe inflammation characterized by erythema, friability and deep ulcerations of the rectum (Fig 1a. and 1b.). Less severe inflammation characterized by erythema of the sigmoid colon (Fig 2a. and 2b.).

S2779

A Drug After My Own Heart: Mesalamine-Induced Perimyocarditis

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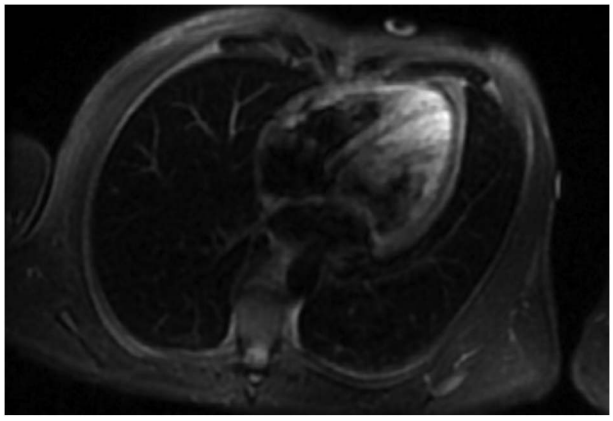
Introduction: Mesalamine is a commonly used first line treatment to induce remission in mild to moderate Ulcerative Colitis (UC) that many patients tolerate well. However it does not come without risk and can rarely cause serious and life threatening cardiac and lung inflammation including myocarditis.
Case Description/Methods: A 33 year old male with recently diagnosed ulcerative pancolitis presented with one day of pleuritic, positional chest pain and exertional dyspnea. Two months prior to presentation he had been diagnosed with moderate pancolonic ulcerative colitis and started on mesalamine 1.2 gm twice daily and mesalamine 1000mg suppository every evening, with significant improvement in his symptoms. On presentation, laboratory evaluation was remarkable for elevated troponin to 0.918 and elevated brain naturetic peptide to 2770. Electrocardiogram showed diffuse PR depression and ST elevations consistent with pericarditis. The patient was admitted for further evaluation. Mesalamine was stopped and he was started on Ibuprofen and colchicine with improvement in his pain. Common viral etiologies were ruled out with polymerase testing. A transthoracic echocardiogram revealed moderate global hypokinesis with a reduced ejection fraction (EF) of 25%. A cardiac MRI showed hyperenhancement throughout basal-to-mid inferior and inferolateral wall with ~5% scar burden proving the diagnosis of perimyocarditis. At 1 month follow up his EF recovered to 52%. His UC symptoms have returned since stopping therapy though he remains hesitant to start other UC therapy given concerns regarding adverse effects. (Figure)
Discussion: Mesalamine induced myocarditis is a rare but potentially lethal complication. It typically occurs within 1-2 weeks of starting the medication but has been reported as early as 48 hours and as late as 4 weeks. The specific pathogenesis of Mesalamine induced myocarditis is unknown. Withdrawal of mesalamine leads to symptomatic improvement in most patients as well as recovery of ejection fraction within weeks of discontinuing the medication, as seen with our patient. Future treatment with mesalamine and other 5-ASA derivatives should be avoided as they can trigger recurrent symptoms. Our case highlights a rare and life threatening complication of a commonly used medication. It also highlights the importance of discussing the potential risks of medications with patients. While rare, these authors recommend discussing the potential for myocarditis when counseling patients on treatment options for UC.



[2779] **Figure 1.** Cardiac MRI with myocardial inflammation.

S2780

J-Pouch-Salpingeal Fistulization: A Rare Consequence of Chronic Pouchitis

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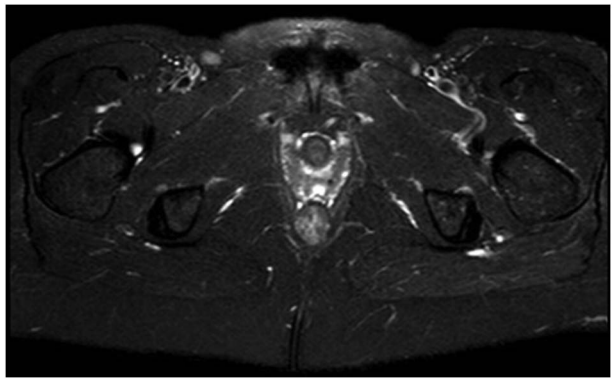
Introduction: Ileal pouch-anal anastomosis, or more commonly known as a J-pouch, is a surgical option after proctocolectomy for refractory ulcerative colitis (UC) rather than ileostomy. Although effective, it does carry a risk for the development of a fistula such as a pouch-vaginal, perianal, or enterocutaneous fistula. We present a rare case of a fistula between the J-pouch and the fallopian tube resulting in gynecological symptoms.

Case Description/Methods: A 45-year-old female with UC presented with worsening diarrhea and feculent vaginal discharge. She had undergone a total colectomy and end ileostomy after failing medical therapy. The subsequent J-pouch had been complicated by chronic pouchitis. Despite several courses of antibiotics and adalimumab, she had continued to have rectal pain and increased frequency of bowel movements. She noted feculent vaginal output prompting multiple negative gynecological examinations. An MRI fistulogram revealed a small focus of fluid in the vagina but no communication between the vagina and J-pouch. Due to worsening symptoms, she presented to the ED. A CT demonstrated pouchitis and air within the vagina. The patient underwent surgery for further management. Intraoperatively, a dense adhesion between the left fallopian tube and the pouch was noticed. This was dissected free and appeared to be the source of the fistula to the gynecologic tract. Vaginoscopy demonstrated the vagina to be intact. Proctectomy with mucosectomy, closure of anus, takedown of fistula, and end ileostomy creation was then performed. The pathology showed chronic ileitis and mucosal ulcerations, but no granulomas. On outpatient follow up, she no longer reported feculent vaginal output. (Figure)
Discussion: Fistula formation is a known but rare consequence of J-pouch creation. To the best of our knowledge, this is the first case report of a fistula between the J-pouch and fallopian tube secondary to chronic pouchitis. Prior case reports of ileo-salpingeal and colo-salpingeal fistulas due to Crohn's disease and diverticulitis, respectively have been described; ours is the first case describing the fistula between J-pouch and fallopian tube. Our patient had persistent feculent vaginal discharge with no definite etiology despite undergoing an MRI fistulogram, multiple gynecological examinations, and CTs. This case describes the utility of surgical exploration in a patient with clinical symptoms of a fistula with negative imaging, especially in those with prior surgical intervention such as a J-pouch creation.



[2780] **Figure 1.** MRI fistulogram demonstrating 5 mm area of fluid within the vaginal vault.

S2781

Crohn's Disease Presenting as Oropharyngeal Candidiasis

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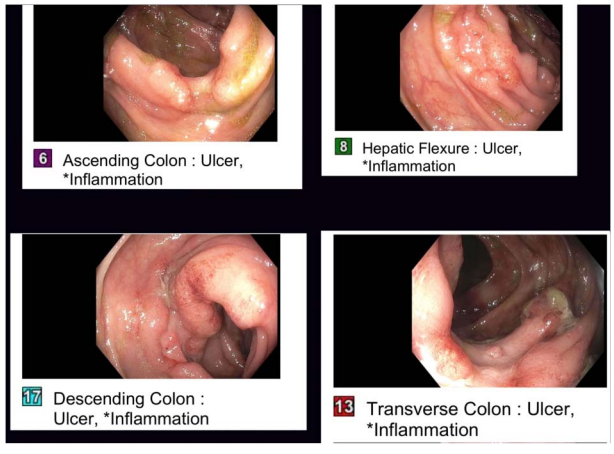
Introduction: Oral lesions are easily visualized and often a sign of systemic disease. One such entity, oropharyngeal candidiasis, is a frequent finding in immunocompromised patients. Oropharyngeal candidiasis as a presenting finding in Crohn's disease (CD) is exceedingly rare. We present the case of newly diagnosed CD manifesting with oropharyngeal candidiasis in the absence of any other immunosuppressing conditions.
Case Description/Methods: A 38-years-old male with no prior medical history presented to the hospital with 1 week of sore throat, white discoloration of the oral cavity, and odynophagia. On review of systems, he also reported intermittent abdominal pain, episodic hematochezia, and a 20lb unintentional weight loss over the past several months. He took no medications and denied any high-risk sexual behavior. On physical exam, his oropharyngeal cavity was coated with white plaques on the buccal mucosa, tongue base, and palate, consistent with a clinical diagnosis of oropharyngeal candidiasis. Initial blood work was remarkable for a leukocytosis of 15,000 and CRP of 15. His HIV serology, EBV (IgG, IgM), and autoimmune workup (ANA, Anti-dsDNA) were negative. Stool multiplex PCR assay and stool ova and parasites were negative as well. His fecal calprotectin was 2399 ug/g. Computed tomography scan of the abdomen and pelvis showed pan-colitis. He subsequently underwent upper and lower endoscopy revealing innumerable ulcers with white exudate on the oropharynx and multiple ulcers throughout the colon. Biopsies demonstrated severe colitis, cryptitis, and crypt abscesses, and a diagnosis of CD was made. The patient started high dose steroids in conjunction with anti-fungal medications and had rapid resolution of all symptoms.
Discussion: Oropharyngeal candidiasis is commonly seen in patients with a recent use of antibiotics, steroids, and immunocompromised states. In patients with CD, it is almost exclusively related to the use of steroids, biologics, or other immunosuppressant medications. Oropharyngeal candidiasis as a presenting symptom in CD is extremely rare with only one case being reported in the medical literature. Our case highlights the importance of keeping a broad differential in patients presenting with oropharyngeal candidiasis, but seemingly without typical risk factors.



[2781] **Figure 1.** Ulcers seen during the colonoscopy procedure.

S2782

Successful Medical Management of a Patient With Severe Hypoalbuminemia due to Ulcerative Colitis

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Introduction: Severe hypoalbuminemia (< 1gm/dL) is a rare complication of ulcerative colitis and may be both debilitating and refractory to therapy. Literature reports indicate that colectomy is curative and imply that it is the treatment of choice. We successfully treated such a patient medically.
Case Description/Methods: This 40-year-old female was diagnosed with proctosigmoiditis in 2017, initially treated with oral mesalamine, then lost to care from 2018 through 2021. She presented in November 2021 with a disease flare and was shown to have pan-colitis. She was started on corticosteroids and began therapy with infliximab with initial symptomatic improvement. However, diarrhea continued, she developed increased symptoms plus anasarca during the steroid taper and was admitted. Serum albumin was 0.5 mg/dL. Inflammatory markers were elevated: C-reactive protein 103.8 mg/L and fecal calprotectin 1,126 ug/g. After infection was ruled out, colonoscopy was performed and showed extensive pseudopolyposis. Non-intestinal causes of protein loss were ruled out. Fecal alpha-1 antitrypsin levels were elevated before but not after an infliximab infusion (0.850 vs 0.110 mg/g, respectively). Despite receiving 10 mg/kg of infliximab every 6 weeks, her trough levels were undetectable and low levels of antibodies were detected. Intravenous albumin and diuretics provided some relief, but serum albumin concentration plateaued around 2.5 gm/dL. Mesalamine then was added to the regimen and the patient improved rapidly, with complete cessation of diarrhea, a rise in serum albumin concentration to 3.5 g/dL over 4 weeks, and clearance of the patient's edema.
Discussion: Severe hypoalbuminemia as a result of ulcerative colitis has previously been described and may lead to treatment failure and colectomy, even during treatment with biologic agents. Some cases are not due to intestinal protein losses such as in co-existing Menetriere's disease or nephrotic syndrome. Elevated clearance rates of the biologic agents lead to subtherapeutic serum levels and antibody formation, promoting treatment failure. This case suggests that there may a role for adjunctive 5-ASA therapy. As part of the medications' anti-inflammatory effects, they decrease enteric loss of infliximab and elevate its serum levels.

S2783

***Strongyloides* Reactivation After Initiation of Infliximab Therapy for Severe Crohn's Colitis**

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Introduction: Biologic therapies have revolutionized the treatment of patients with inflammatory bowel disease (IBD) and Anti-TNFa inhibitors are the most commonly used agents for patients with moderate to severe disease. Prior to initiation, patients are checked for Tuberculosis (TB) and Hep-B but checking for other latent infections is determined by the Physician. Strongyloides, an endemic South American parasite, is one such potentially latent infection for which no guidelines exist. We present the multi-admission hospital course of a patient with severe Crohn's Colitis who had reactivation of latent strongyloides after starting Infliximab.
Case Description/Methods: A 53 year old Male from South America presented to the ED with hematochezia, fevers, abdominal pain, and a purulent left shin lesion. Past medical history included poorly controlled Crohn's Colitis refractory to other therapies. Upon arrival the patient was tachycardic, had diffuse abdominal pain, and had multiple bloody bowel movements. A 7 by 4 cm ulcerated lesion with visible necrotic tissue, fibrinous debris and violaceous borders was visualized on his leg. Blood work revealed leukopenia, anemia, an elevated CRP and ESR. Biopsy of the lesion was consistent with Pyoderma Gangrenosum. He was treated with IV corticosteroids with improvement. Serologies for Hepatitis B, C, HIV, latent TB, and a stool test for parasites were negative. Given disease severity therapy with infliximab and 6-mercaptopurine (6MP) was started. The next day he developed worsening pain, and bloody diarrhea. Strongyloides parasites were visible in stool smears and blood work showed eosinophilia. Inflixmab and 6MP were discontinued and ivermectin and a steroid taper were started. Repeat stool studies revealed successful eradication of Strongyloides after which infliximab and 6MP were restarted. The patient had an uncomplicated discharge and is tolerating infliximab well. (Figure)
Discussion: Biologics are becoming very common in the medical field in the setting of an increasingly interconnected world and this case shows positive and negative aspects of this. While they may carry an increased risk of severe infection, they are well tolerated and provide dramatic relief. While screening may capture many latent infections there are no recommendations outside of Hep-B and TB. Developing new tools to screen or looking to our International Colleagues for guidance may be necessary as our communities at home become truly international.

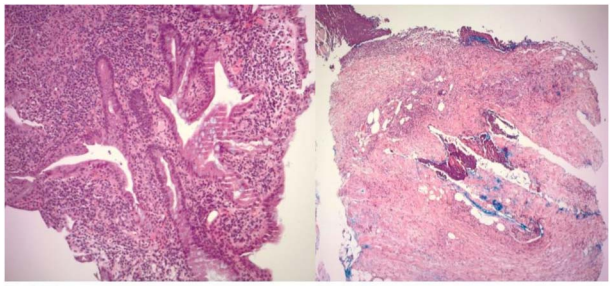

Fig. 1 (100x): **Colon at 80 cm**
Moderate chronic active colitis. Blue arrows demonstrate crypt architectural distortion, which is a feature of chronicity in IBD. The presence of neutrophils within crypt epithelium constitutes active colitis (blue circle).

Fig 2 (100x): **Right lower extremity wound**
Wide-spread predominantly neutrophilic infiltrate throughout the dermis with surface ulceration consistent with pyoderma gangrenosum in the setting of known IBD.

[2783] **Figure 1.**

S2784

A Case of Delayed Cervical Cancer Diagnosis in a Patient With Crohn's Disease

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Introduction: Increased cancer risk in inflammatory bowel disease (IBD) is thought to be due to immunosuppression from biologic therapy and/or inflammation. Women with IBD have an increased risk of melanoma and adenocarcinoma of the small bowel and colon, and those that are on an immunosuppressive regimen that includes azathioprine have an additional increased risk of lymphoma and squamous cell carcinoma of the skin and cervix. Here we present a case of a patient with an atypical and rare malignancy, whose diagnosis was delayed due to overlap in the symptoms of the malignancy and her known IBD diagnosis.
Case Description/Methods: A woman in her mid 40s with a 28-year history of colonic Crohn's disease maintained on ustekinumab injection. She was previously taking azathioprine for 7 years and initially responded to adalimumab, but after a flare, was switched to ustekinumab with symptomatic and endoscopic response. She then presented to her gynecologist in November 2020 with complaints of bloating and large amounts of clear vaginal discharge. A cervical exam and routine pap smear of the ectocervix showed normal cytology. Eight months later, the patient presented to her gastroenterologist with worsening bloating, hematochezia, left lower quadrant pain, and persistent vaginal discharge. The patient was concerned for an IBD flare, but noted that the abdominal bloating and vaginal discharge were different than her usual flare. After CT abdomen/pelvis revealed 2 large pelvic complex cystic lesions, her biologic was stopped and she underwent a hysterectomy with bilateral salpingo-oophorectomy. Pathology revealed non-HPV associated invasive moderately differentiated gastric-type endocervical adenocarcinoma. She completed treatment with an anti-VEGF antibody, but a restaging PET scan six months later showed uptake consistent with peritoneal carcinomatosis.
Discussion: This immunosuppressed patient had an advanced and aggressive non-HPV endocervical cancer which was missed on ectocervical pap smear. Pap smears that include inadequate endocervical samples are considered suboptimal, but are usually not grounds for further testing in the average patient. However, Crohn's disease patients have increased risk of low- and high-grade squamous epithelial cervical lesions and cervical cancer compared to women without IBD, likely due to a combination of elevated inflammatory state and immunosuppressive medications. Cervical cancer screening in immunosuppressed patients with IBD should include adequate endocervical sampling.

S2785

A Case of Dual Biologic and Immunomodulator Therapy Used to Treat Refractory Crohn's Disease

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Introduction: Despite advancements in biologic therapy, obtaining complete remission in patients with severe stricturing Crohn's Disease can be quite challenging. Our case highlights an unfortunate patient with severe medical-refractory Crohn's disease who ultimately achieved clinical remission using dual immunomodulator and biologic therapy with tofacitinib and vedolizumab.
Case Description/Methods: We present a 62-year-old male with a long history of ileocolonic Crohn's disease. He was initially diagnosed in 2011 after presenting with abdominal pain. Colonoscopy at diagnosis noted ileocolonic inflammation with supportive biopsies of IBD. He was started on infliximab with improvement however this was discontinued due to financial hardships. He was transitioned to combination therapy with adalimumab and methotrexate in 2014 however his disease progressed, resulting in an SBO in 2017 requiring an ileocecectomy. He was then started on ustekinumab in 2018. Unfortunately restaging at six months noted active disease at his anastomosis. He was transitioned then to vedolizumab in 2019, however one year later was noted to have persistent inflammation at the anastomosis with stricture refractory to corticosteroids. He underwent further resection with diverting ostomy with eventual takedown in 2020 after multiple hospitalizations for high ostomy output. He was quickly restarted on vedolizumab with aggressive therapeutic drug monitoring with evidence of persistent disease activity despite the addition of methotrexate. Following a multidisciplinary discussion, his methotrexate was exchanged for tofacitinib in early 2022 with drastic improvement in both symptoms and biomarkers. Aside from a brief self-limited episode of norovirus gastroenteritis, he has tolerated dual therapy well with few adverse events. He is undergoing restaging this summer.
Discussion: This case highlights the efficacy of using dual biologic and immunomodulator therapy to help treat a patient with refractory Crohn's Disease. It is well established that combining biologics and immunomodulators can help wean steroid dependence and maintain remission in patients who suffer from IBD. While several studies have evaluated the use of tofacitinib and vedolizumab in Ulcerative Colitis, few studies have looked at rates of remission in Crohn's Disease. This case demonstrates that the use of off-label dual biologic and immunomodulator therapy for treatment of refractory Crohn's disease can be an effective and safe treatment for this cohort of patients.

S2786

A Delay in Diagnosis of Crohn's Disease Presenting as Gastrointestinal Amyloidosis

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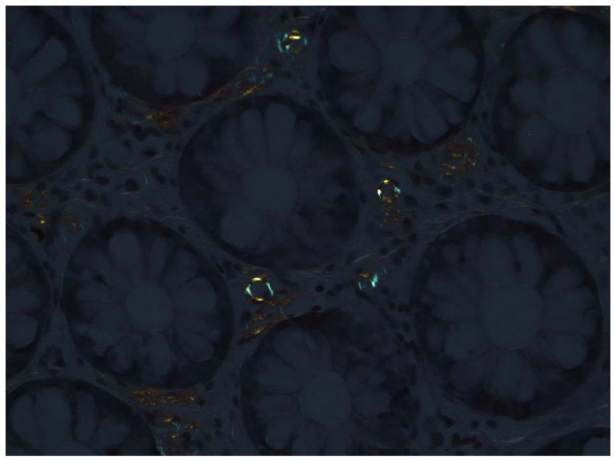
Introduction: Secondary (AA) Amyloidosis is a known rare complication of Crohn's disease (CD) and Ulcerative colitis (UC). It usually takes years to develop. Here we discuss a patient's case who presented to us with manifestations of chronic inflammation and gastrointestinal symptoms. She was found to have systemic amyloidosis involving the gastrointestinal tract and endoscopic appearing Crohn's disease.
Case Description/Methods: A 45 year old Caucasian female presented for bidirectional endoscopy for iron deficiency anemia and unintentional weight loss. Her past medical history includes active uveitis and chronic anemia. For years, she struggled with fatigue, arthralgias, bloating, and alternating constipation and diarrhea. She was treated by her rheumatologist for uveitis with methotrexate (MTX) 10mg weekly and infliximab 3mg/kg/ 8weeks that was started 7 months prior to her presentation. Colonoscopy was significant for friable mucosa of the ileum and Mayo 1 colitis in the sigmoid colon and rectum. Terminal ileal and segmental colonic biopsies showed AA (Figure). Her constellation of symptoms and clinical presentation had suggested underlying Crohn's disease. Therefore, her Infliximab was increased to 10 mg/kg every 6 weeks. After several months of therapy the patient noted significant improvement in symptoms along with correction of her laboratory levels including her hemoglobin to 13 g/dl and thrombocytosis and improved CRP and ESR levels.
Discussion: The duration of inflammatory bowel disease (IBD) was found to be significantly longer in patients with AA amyloidosis versus those without it. However, multiple studies reported the concomitant diagnosis of IBD and amyloidosis probably because of delay in diagnoses of the IBD. The diagnosis of IBD must still be considered in patients with AA amyloidosis after excluding other more common reasons even in the absence of a history of IBD. Treatment is through controlling the underlying IBD with Infliximab, being the most commonly used anti-tumor necrosis factor.



[2786] **Figure 1.** Rectal biopsy with Congo red stain reveals congophilic material within the microvasculature and occasional macrophages consistent with amyloid protein.

S2787

A Classic Cutaneous Manifestation of Newly Diagnosed Ulcerative Colitis

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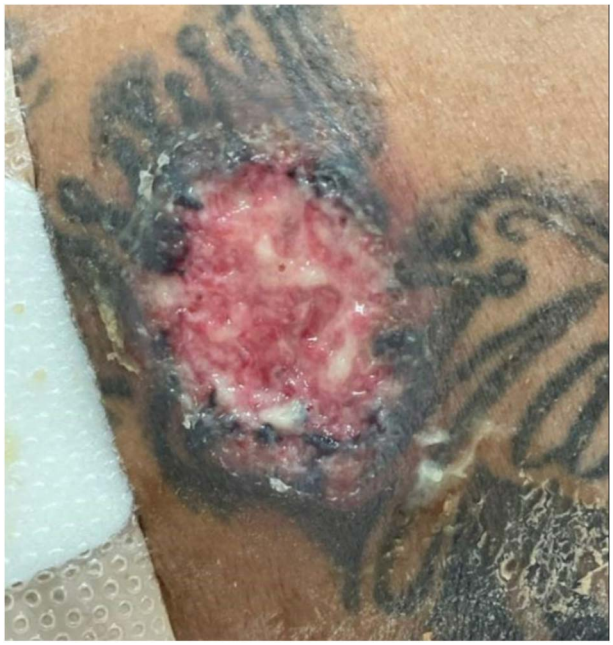
Introduction: Pyoderma gangrenosum (PG) is a rare dermatologic manifestation with an incidence of only 3 to 10 cases per million people per year. Though rare, PG and its association with systemic inflammatory disease is well described. This ulcerative, non-infectious neutrophilic dermatosis is most associated with inflammatory bowel disease (IBD) and is specifically associated with ulcerative colitis (UC) in 5 to 12% of cases, although fewer than 3% of patients with UC develop PG. Here we describe a case of a 36-year-old male who presented with progressively worsening bloody diarrhea associated with an exquisitely painful, ulcerative right shoulder lesion that was treatment-refractory to multiple courses of antibiotics.
Case Description/Methods: A 36-year-old man with no significant past medical history presented with three weeks of watery diarrhea often mixed with blood and associated with generalized abdominal pain, weight loss, and malaise. He also reported a worsening right anterior shoulder lesion that he noticed prior to the onset of his gastrointestinal complaints and was refractory to treatment with courses of both TMP-SMX and minocycline. Initial CT imaging revealed pancolitis with perirectal and right lower quadrant reactive lymphadenopathy. Dermatopathology of the lesions obtained during admission revealed diffuse dermal neutrophilic infiltrates consistent with PG. He underwent colonoscopy which revealed inflammation in a continuous and circumferential pattern from rectum to cecum with no colonic sites spared. Tissue samples obtained during colonoscopy returned consistent with ulcerative pancolitis. He was started on intravenous steroids for three days followed by a switch to oral steroids with a marked improvement in abdominal pain, diarrhea, and appearance of the skin lesion. He was discharged with outpatient Gastroenterology follow up where he was initiated on biological therapy with continued improvement in symptomatology. (Figure)

Discussion: The prevalence of extraintestinal manifestations (EIM) in patients with IBD range from 6 to 47%. This case exhibits how EIMs can be commonly misdiagnosed and subsequently mistreated, especially if dermatologic disease precedes the onset of gastrointestinal complaints. This case reinforces the importance of a detailed history and physical exam while ensuring documentation of an accurate timeline of symptom onset. This case also displays the importance of proper review of symptoms and further workup of dermatological lesions prior to assuming infectious etiology.



[2787] **Figure 1.** Right shoulder lesion on admission.

S2788

A Rare Case of Duodenal Crohn's Disease Presenting as Megaduodenum

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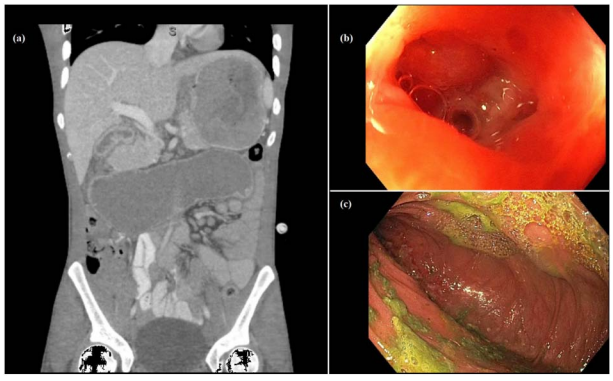
Introduction: Crohn's disease of the duodenum is exceedingly rare and accounts for less than 2% of Crohn's disease cases, disease confined to the duodenum is an even rarer entity.[1] Megaduodenum is typically seen in infants and its presence in adults is the subject of a few case reports. We present an unusual presentation of an adult patient with Crohn's disease presenting as megaduodenum.
Case Description/Methods: A 20-year-old male with a history of gastroparesis presented with mild epigastric pain, intractable nausea, vomiting, and 60 pounds of weight loss over the last six months. The patient had severe food intolerance to the point where he required total parenteral nutrition. CT scan showed distention of the stomach with tapering of the proximal duodenum, followed by subsequent marked diffuse distention of the remaining duodenum with subsequent narrowing at the duodenojejunal junction. (a). An esophagoduodenoscopy (EGD) was performed that showed distended duodenum, a proximal duodenal stricture, and another stricture at the duodenojejunal junction with inflamed mucosa and severe stenosis which could not be traversed. (b,c). Biopsies showed duodenitis consistent with Crohn's disease. A PEG-J tube was placed for enteral feeding which the patient did not tolerate and ultimately required resection of the distended duodenum.
Discussion: Megaduodenum is usually congenital and is a rare entity in adults. In this case, duodenal distention was likely acquired and unfortunately required resection due to the severity of symptoms. In our opinion, the patient likely had skipped lesions in the duodenum with significant dilatation of the inflamed area. There was no colorectal involvement confirmed by a colonoscopy. Post-operative biopsies also confirmed Crohn's disease in the duodenum.



[2788] **Figure 1.** (a): Megaduodenum on CT scan Figure (b): Duodenal distention on EGD Figure (c): Duodenal stricture on EGD.

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S2789

A Rare Triad of Ulcerative Colitis, Large Vessel Vasculitis and Celiac Disease

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Introduction: Inflammatory bowel disease (IBD) has been associated with large-vessel vasculitis (LVV), with the diagnosis of IBD preceding that of LVV by years. We present for the first time in known literature a triad of concurrent ulcerative colitis (UC), aortitis and celiac disease.
Case Description/Methods: A 58 year old Hispanic man with a history of hypertension and gout presented with two weeks of intractable temporomandibular headaches, and two months of non-bloody diarrhea and weight loss. Physical exam was unremarkable. Labs showed hemoglobin 6.9 g/dL, erythrocyte sedimentation rate 120 mm/hr, C-reactive protein 281 mg/dL and IgA tissue transglutaminase antibody 23 U/mL. ANA, C3, C4, proteinase-3 and myeloperoxidase antibodies were within normal limits. Colonoscopy showed pancolitis from rectum to ascending colon. The terminal ileum was normal. Abdominal MRI found aortic wall hyperintensity from the renal arteries to common iliac bifurcation. CT angiogram showed wall thickening of the left carotid artery, aortic arch, descending thoracic and abdominal aorta, consistent with vasculitis. Patient was given stress dose steroids with improvement in headache and normalization of ESR and CRP. Temporal artery biopsy was unremarkable. Four months after hospitalization, repeat colonoscopy with duodenal biopsies for celiac disease revealed mild increase in intraepithelial lymphocytes with preserved villous architecture. He was started on a gluten free diet and adalimumab in combination with methotrexate for UC and LVV.
Discussion: About 10 case reports of patients with both UC and either Takayasu (TAK) or giant cell arteritis (GCA) have been described, with UC typically diagnosed 15-45 years before the vasculitis. Vasculitis in the GI tract can mimic IBD, making colonoscopy and biopsy crucial for diagnosis. HLA haplotypes A24, B52, and DR2 are associated with both UC and aortitis and Interleukin-9, observed in temporal arteritis lesions, may be implicated in the pathogenesis of UC. Shared chromosomal variants between patients with UC and celiac disease may explain why IBD risk is up to 9-fold higher in patients with celiac disease. Our patient may have presented with isolated aortitis or an early form of GCA. Methotrexate is used to treat LVV and is combined with an anti-TNF agent to treat UC, as in our case. This is the first known report of co-occurring UC, celiac disease and aortitis; however, whether the three inflammatory conditions are mechanistically related warrants further research.

S2790

A Sweet Response: Crohn's Flare Leading to Sweet Syndrome

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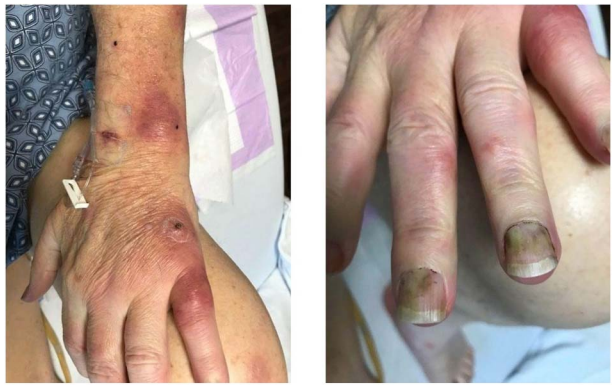
Introduction: Sweet's syndrome, or acute febrile neutrophilic dermatosis (AFND), is a rare extraintestinal manifestation of inflammatory bowel disease (IBD). It presents with fever, malaise, and erythematous papules that are tender, edematous, and, rarely, bullous. It is associated with underlying diseases including IBD, infections, cancer, autoimmune disorders, medications, and pregnancy.
Case Description/Methods: A 79-year-old male with colonic Crohn's disease (on Infliximab), NSAID-related peptic ulcer disease, and recurrent Clostridium Difficile infection presented with sudden onset, exquisitely painful, bullous rash with fevers to 102ºF. The blistering eruptions started on his left wrist and spread to his arms and legs, including extensor and flexor surfaces and soles of his feet. His laboratory results were significant for white blood cell count of 18.5 K/uL, erythrocyte sedimentation rate of 130 mm/hr, c-reactive protein of 185.5 mg/L, and positive ANA titer 1:320. Gastroenterology was consulted for concern for IBD associated dermatological manifestation such as erythema nodosum (EN) or pyoderma gangrenosum (PG); however, given atypical appearance and distribution, dermatology consultation was recommended, and punch biopsy was obtained. Skin biopsy revealed nodular dermal neutrophilic infiltrate, consistent with Sweet's syndrome. Given association with IBD, colonoscopy was performed revealing significant inflammation with large ulcers throughout the colon. Simple Endoscopic Score for Crohn's disease was 25 with biopsies consistent with severe chronic active colitis. He was started on IV steroids with immediate improvement in pain and flattening of lesions. Ultimately, his infectious workup was negative, and it was concluded that his presentation was from severe Crohn's flare. (Figure)
Discussion: EN and PG are commonly associated with IBD; however, Sweet's syndrome is rarely associated with IBD itself, and can also develop as a result of immunosuppressant medications or opportunistic infections. This case of Sweet's syndrome was unique as it was secondary to uncontrolled IBD, the lesions were bullous, and the patient was male, as classically it is more common in females. It is prudent in patients with atypical appearance of skin lesions, to consider a multidisciplinary approach with dermatology consultation to diagnose and treat appropriately. Understanding the vast array of skin manifestations of IBD is key in providing comprehensive care to IBD patients.



[2790] **Figure 1.** Left: Bullous lesions noted on patient's arm Right: Fingernail changes.

S2791

A Rare Etiology for Ulcerative Colitis Flare

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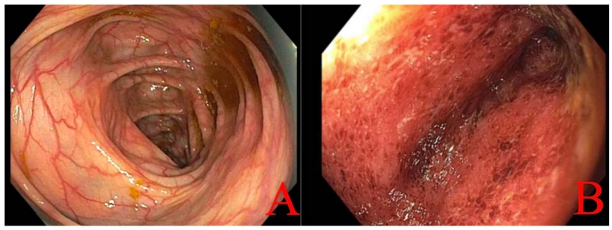
Introduction: Prior to colonoscopy, it is well understood that patients must undergo bowel cleansing. Based on the type of laxative, colonoscopy preparations fall into two categories – polymer-based formulas (PEG) and saline-based formulas (NaP). Both types of bowel preparations are deemed to be relatively safe and part of routine practice. However, we describe the rare case of an ulcerative colitis (UC) flare due to the bowel preparation formula.
Case Description/Methods: A 29-year-old female with diagnosis of UC, presently in clinical and biochemical remission on oral mesalamine, contracted COVID-19 and had reactivation of UC symptoms. After being on budesonide tablets and rectal foam for two months, patient achieved clinical remission, and a surveillance colonoscopy was performed which revealed normal colon and terminal ileum except mild congestion in the cecum (Figure A). Pathology revealed unremarkable mucosa in the entire colon except for chronic active colitis in the cecum. Immediately following this colonoscopy, the patient started to experience another severe UC flare requiring hospitalization. The patient's laboratory work-up was normal except for an elevated fecal calprotectin (1710). Stool infectious work-up was negative and the patient denied any NSAID or antibiotic use. The patient underwent a repeat colonoscopy which revealed severe Mayo 3 pancolitis (Figure B) in comparison to a stable colonoscopy a few weeks prior. It was revealed that for her initial colonoscopy, she had used SUPREP bowel prep kit. On prior colonoscopies she had used MiraLAX bowel prep with no adverse effects. During hospitalization, the patient was started on biologic therapy with good effect.
Discussion: There are no clear guidelines on appropriate bowel preparation formula for the inflammatory bowel disease (IBD) population. Sufficient literature exists to confirm that NaP can irritate the intestinal mucosal wall. Moreover, numerous animal experiments have employed dextran sodium sulfate for chemical induction of intestinal inflammation to mimic UC flares in humans [1]. Thus, it can be

surmised that because SUPREP ingredients contain sodium sulfate, the potential for UC flare is higher. It is pertinent for practitioners to be aware of the possible rare adverse effects of saline-based formulas, especially when treating the IBD population.



[2791] **Figure 1.** (A) Colon (04/19/2022) and (B) Colon (05/09/2022).

REFERENCE

[1] Eichele DD, et al., Dextran sodium sulfate colitis murine model: An indispensable tool for advancing our understanding of IBD pathogenesis, 2017, 6016-6029.

S2792

A Tale of Three Stomas: A Challenging Case of Inflammatory Bowel Disease

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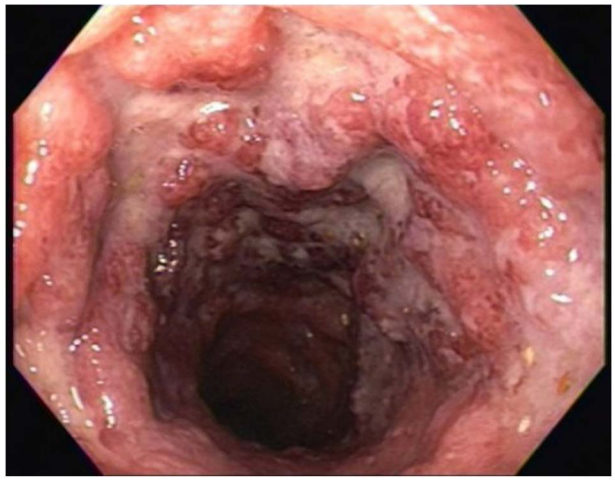
Introduction: Inflammatory bowel disease (IBD) and diverticular disease have many overlapping sequelae. It can be difficult to distinguish between them in an acute presentation. Here, we report a challenging case of IBD that originally presented as complicated diverticular disease. We highlight the diagnostic and management considerations.
Case Description/Methods: A 75-year-old female without personal or family history of IBD presented in June 2021 with abdominal pain and fever, was diagnosed with uncomplicated diverticulitis and treated with a course of antibiotics. She recovered clinically but presented in July 2021 with worsening abdominal pain and bloody diarrhea. She was found on imaging to have a colonic perforation and abscess. She was taken for a Hartmann procedure with sigmoidectomy and colostomy formation, with surgical pathology suggestive of acute diverticulitis. Abdominal pain and bloody ostomy output continued. She presented to our medical center in September 2021. Evaluation showed deep ulcerations and spontaneous friability, concerning for IBD. She was started on steroids but she proved refractory. We then offered rescue infliximab, after which she clinically improved. She was maintained on infliximab as an outpatient. Before repeat endoscopic evaluation, she presented again to the hospital with abdominal pain and was found to have another colonic perforation. She underwent a completion subtotal colectomy, extensive lysis of adhesions and received an end ileostomy. Pathology showed severely active chronic pancolitis with ulceration. She currently is in clinical remission, not currently on any IBD therapy.
Discussion: The diagnosis for this patient has proved difficult, given her initial acute presentation. Complicated diverticulitis has overlapping features with IBD, and is more prevalent than IBD. It is less prevalent in the IBD population, with one study showing prevalence in ulcerative colitis (UC) of 10.8% compared to 27.8% in healthy controls. Endoscopic evaluation was important in understanding the presence of IBD, though it has been challenging to define a distinct entity of UC versus Crohn's disease given her history of abscess and colonic perforation. The rate of intra-abdominal abscess in UC is low but has been described. In one single center analysis, the rate of intra-abdominal abscess in UC vs Crohn's disease with 0.8% vs 2.4%, respectively. After surgical recovery, we plan for small bowel evaluation to further delineate the extent of inflammation.



[2792] **Figure 1.** Image from colonoscopy from 9/21/21 showing erythema, ulceration, friability.

S2793

Adrenal Crisis in a Patient With Crohn's Disease: A Legacy of the Corticosteroid Treatment Era

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Introduction: Before the era of biologic agents, corticosteroids were the most effective therapy available for inflammatory bowel disease (IBD) as well as other inflammatory and immune-mediated disorders, and treatment often was prolonged. As a result, many patients developed secondary adrenal insufficiency, in which the normal circadian rhythm of cortisol secretion was maintained but a defect in the cortisol response to stress persisted, as was the risk of adrenal crisis in response to severe physiologic stress. As corticosteroids are no longer used chronically in IBD, adrenal crisis has become a rare complication, and many gastroenterologists have no personal experience with it. We recently saw such a case which we are presenting as a reminder of its continued existence.
Case Description/Methods: A 73-year-old female with Crohn's disease diagnosed at the age of 18, complicated by short bowel syndrome and esophageal involvement, who had been steroid dependent for 15 years though stable on ustekinumab and no steroids for more than 8 years, presented to the emergency department with an acute onset of abdominal pain, diarrhea with incontinence, profound weakness, disorientation, and possible syncope, one hour after IV iron sucrose therapy. Initial physical exam was notable for pallor and edema of hands and feet. Laboratory exams showed hemoconcentration, leukocytosis, hyponatremia, plus elevated serum lactate concentration and anion gap. Because of the severity of this response, the possibility of adrenal crisis was raised: serum cortisol was 15.5 ug/dL (nl 6.2-29) despite the stressful situation and the patient responded clinically to 100 mg of hydrocortisone IV. She was discharged within 24 hours and all laboratory abnormalities reversed within 72 hours.

Discussion: Adrenal crisis can present with a wide variety of nonspecific symptoms and should be in the differential diagnosis when a patient presents after a significant physiologic stress and has a history of chronic oral corticosteroid use. Electrolyte disturbances are less common in secondary adrenal insufficiency as the zona glomerulosa of the adrenal gland is not affected. Secondary adrenal insufficiency may persist for many years after chronic steroid use and may be permanent. In patients with secondary adrenal insufficiency. Important hints are the patient's age and GI history, which includes extent of exposure to corticosteroids. Effective diagnosis requires maintaining a high index of suspicion.

S2794

An Unexpected Cause of Abdominal Pain in a Patient With Ulcerative Colitis

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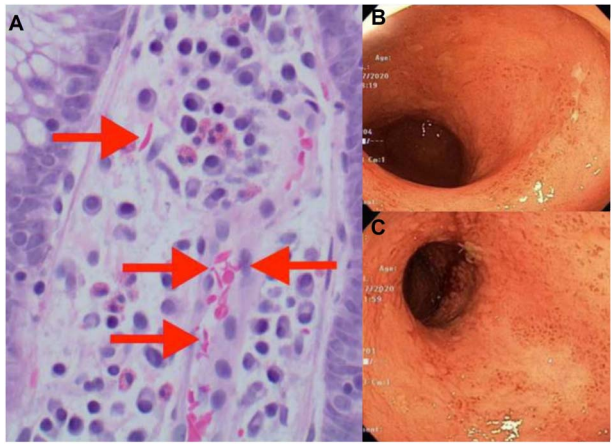
Introduction: Sickle cell crisis and Ulcerative Colitis (UC) can both present with abdominal pain, which can present a diagnostic challenge in patients with concomitant disease. Thorough work-up is required to appopriately achieve the diagnosis and guide treatment.
Case Description/Methods: A 27 year old female with a history of UC presented to the ED with non-bloody diarrhea, diffuse abdominal pain, and right lower extremity pain. On exam, she was mildly hypotensive with decreased strength in bilateral lower extremities. CBC showed Hgb 7.6g/dL, and iron panel revealed: iron saturation 28%, elevated ferritin (580.5ng/mL), low haptoglobin (< 30mg/dL), elevated reticulocyte count (7.47%), and reticulocyte index of 2.05. CT scan showed splenomegaly and diffuse bony infracts. Colonoscopy revealed Mayo 3 ulcerative pancolitis (FigureB and FigureC). Biopsy (FigureA) showed sickle cells in the capillaries and lamina propria with background features of chronic colitis. She was diagnosed with concomitant UC flare and sickle cell crisis. Her sickle cell crisis was managed with IV fluids, analgesics, and folic acid, and her UC was treated with IV solumedrol. She was discharged on a prednisone taper and initiated on infliximab infusions with significant improvement in her symptoms.
Discussion: There is a rare predisposition of SCD to IBD, though the cause is not well elucidated [1]. In these patients, abdominal pain may be either due to SCD crisis or UC flare. Hence, elucidating the cause is important in guiding treatment. While acute pain due to vaso-occlusion often affects the extremities, it can also manifest as abdominal pain due to mesenteric vaso-occlusion. UC on the other hand, typically presents with left lower quadrant abdominal pain with associated diarrhea; however UC can also present with diffuse abdominal pain in the setting of pancolitis. Diarrhea and dehydration due to UC flares could presumably exacerbate SCD leading to more frequent crises. Dehydrated SCD patients, in the setting of travel, were more likely to be hospitalized for vaso-occlusive crises. Additional complications to consider in treating concurrent SCD and UC is avascular necrosis (AVN). AVN is an associated complication of SCD, as well as a side effect of long-term corticosteroid use. Due to the pro-thrombotic state associated with both diseases, prophylactic anticoagulation can also be considered in the setting of immobilization or hospitalization, and do not necessarily have to be stopped due to bloody diarrhea or anemia [3].



[2794] **Figure 1.** A: colonic biopsy demonstrating sickled red blood cells in the lamina propria and capillary. B and C depict Mayo 3 pancolitis.