EVIDENCE-BASED GI
AN ACG PUBLICATION

IBD Surveillance Colonoscopy: To Spray or not to Spray!

Dr Vasantham Chaudhary
Guest Contributor

Elie Al Kazzi
Associate Editor

Vasantham Chaudhary, MD and Elie S. Al Kazzi, MD, MPH[2]

[1]Fellow Physician, Division of GI & Hepatology, New York University Langone Health, New York, NY

[2]Assistant Professor of Medicine, New York University Grossman School of Medicine, New York, NY

IBD

This summary reviews Te Groen M, Wijnands AM, den Broeder N, et al. Surveillance in inflammatory bowel disease: White light endoscopy with segmental re-inspection versus dye-based chromoendoscopy - a multi-arm randomised controlled trial (HELIOS). Gut. 2025;74(4):547-556.

Correspondence to Elie S. Al Kazzi, MD, MPH, Associate Editor Email: EBGI@gi.org

Keywords: RCT, IBD, surveillance, chromoendoscopy, neoplasia

STRUCTURED ABSTRACT

Question: Among adult patients with inflammatory bowel disease (IBD) in remission, is high-definition (HD) white-light endoscopy with segmental reinspection non-inferior to HD chromoendoscopy to detect colorectal neoplasia?

Design: Multi-center, open-label randomized controlled trial (RCT) testing non-inferiority.

Setting: Four academic hospitals in The Netherlands.

Patients: Adults aged ≥18 years with colonic IBD (with ≥30% colonic involvement) and ≥8 year disease duration (or any duration if concomitant primary

sclerosing cholangitis). Patients were excluded if there was active inflammation (>20 cm of colonic involvement) or poor bowel preparation (Boston Bowel Preparation Score <6).

Interventions: HD white-light endoscopy on colonoscopy withdrawal, with a second-look segmental re-inspection of each colonic segment. This was compared to single-pass HD white-light endoscopy and HD chromoendoscopy with spraying dye during withdrawal and segmental reintroduction and inspection.

Outcomes: Primary outcome was colorectal neoplasia detection rate (the proportion of patients with macroscopic colorectal neoplasia with pathology finding: indefinite for dysplasia, low-grade dysplasia, high-grade dysplasia, colorectal cancer, sessile serrated adenoma with dysplasia). Secondary outcomes were: total number of resected or biopsied macroscopic lesions per colonoscopy, total number of colorectal neoplasia per colonoscopy, procedure time, withdrawal time, impact of withdrawal time on the colorectal neoplasia detection rate (number of detected neoplasia per 10 minutes of withdrawal time), and number of macroscopic lesions detected during first vs second inspection round for HD white-light endoscopy with reinspection.

Data Analysis: Per-protocol (for the primary analysis) as well as modified intention-to treat analysis. Patients' characteristics and outcomes were summarized using descriptive analysis between the three arms of the study. HD white-light endoscopy with segmental reinspection was compared to HD chromoendoscopy using a non-inferiority analysis, while it was compared to HD white-light single pass endoscopy using a superiority analysis.

Funding: Supported by the Dutch Initiative on Crohn and Colitis, and the "StichtingInnovatie en Kwaliteit Maag, Darm-, Leverziekten" (Tilburg, The Netherlands) (AMW).

Results: Among 666 patients enrolled, 265 were randomized to HD white-light endoscopy with segmental reinspection, 268 to HD chromoendoscopy, and 133 to

single-pass HD white-light endoscopy (median age 48-52 years, 49%-55% male, median disease duration 15-19 years, with 53%-63% with ulcerative colitis, 36%-45% with Crohn's disease).

Colorectal neoplasia was detected in 10.3% with HD white-light endoscopy with segmental reinspection (with 81% of lesions detected during first inspection), 13.1% with HD chromoendoscopy, and 6.1% in single-pass HD white-light endoscopy (**Table 1**). Segmental reinspection was non-inferior to chromoendoscopy (difference -2.8%, with lower boundary of 95% confidence interval (CI) at -7.8% not exceeding the -10% non-inferiority margin, $P<0.01$) but not superior to single-pass endoscopy (difference +4.1%, $P=0.19$). For white-light with reinspection, total number of resected or biopsied lesions per colonoscopy was lower when compared with HD chromoendoscopy (n=123 vs 175, $P<0.01$) and comparable to single-pass endoscopy (n=54, $P=0.32$). For white light with reinspection, withdrawal time was shorter than for chromoendoscopy (-8.0 minutes, $P<0.01$) and longer than for single-pass endoscopy (+4.0 minutes, $P<0.01$). When adjusted for withdrawal time, their detection rates were similar. Results of the modified intention-to-treat analysis (597 patients) were concordant with per-protocol analysis for both primary and secondary outcomes.

	HD White-Light Endoscopy with Segmental Reinspection	HD Chromoendoscopy	Single-Pass HD White-Light Endoscopy
N	**234**	**214**	**115**
Colorectal Neoplasia Detection Rate	10.3%	13.1%	6.1%
Total Lesions Resected/Biopsied	123*	175*	54
Withdrawal Time (mean difference)	Reference (median 19 min)*	+8.0 min*	−4.0 min*
Neoplasia Detection per 10 min (median)	0.062	0.058	0.044
Adjusted Detection Rate (OR)	Reference	OR 0.97 (95% CI 0.92 –1.03, $P=0.34$)	OR 1.03 (95% CI 0.93–1.14, $P=0.56$)

Table 1. Study results.

*statistically significant. CI, confidence interval; HD, high-definition; OR, odds ratio.

COMMENTARY

Why Is This Important?

Patients with IBD are at increased risk of colorectal cancer, which underlines the importance of effective surveillance methods. Dye-based chromoendoscopy has been a key method for improved neoplasia detection, but its use can be limited by procedure time, logistics and expertise of the endoscopists. This trial shows that white-light endoscopy with segmental reinspection may be a practical alternative with comparable results for neoplasia detection. The study suggests that a longer withdrawal time is key rather than the application of a dye for a higher neoplasia detection rate.

Key Study Findings

Among 563 patients, colorectal neoplasia was detected in 10.3% with HD white-light endoscopy with segmental reinspection (with 81% of lesions detected during first inspection), 13.1% with HD chromoendoscopy, and 6.1% in single-pass HD white-light endoscopy.

Segmental reinspection was non-inferior to chromoendoscopy (difference -2.8%, with lower boundary of 95% CI at -7.8% not exceeding the -10% non-inferiority margin, $P<0.01$) but not superior to single-pass endoscopy (difference +4.1%, $P=0.19$).

For white-light with reinspection, total number of resected or biopsied lesions per colonoscopy was lower when compared with HD chromoendoscopy (n=123 vs 175, $P<0.01$) and comparable to single-pass endoscopy (n=54, $P=0.32$). For white light with reinspection, withdrawal time was shorter than for chromoendoscopy (-8.0 minutes, $P<0.01$) and longer than for single-pass endoscopy (+4.0 minutes, $P<0.01$). When adjusted for withdrawal time, their detection rates were similar. Results of the modified intention-to-treat analysis (597 patients) were concordant with per-protocol analysis for both primary and secondary outcomes.

Caution

Limitations include lower than expected neoplasia detection rates with smaller than expected differences between groups which affected the superiority analysis and non-inferiority margin (which could have been set lower). There was also heterogeneity in chromoendoscopy dye (methylene blue or indigo carmine). The drop-out rate was also unexpectedly high at 15% (from initially expected at 5%). Finally, the study did not include HD virtual chromoendoscopy which is becoming a widely used technique (this method was not included in guidelines at the start of this study).

My Practice

Current ACG guidelines recommend using dye-based chromoendoscopy when using standard-definition colonoscopy for IBD surveillance, and recommend either dye-based chromoendoscopy or narrow-band imaging when using HD

colonoscopy, though the body of evidence for these recommendations is rated overall low quality.[1] The American Gastrointestinal Association expert review recommendations state similar recommendations: dye-based chromoendoscopy should be used when using standard-definition colonoscopy or with history of dysplasia, but that virtual chromoendoscopy can be a suitable alternative when using HD colonoscopy.[2]

In our current practice, we use HD virtual chromoendoscopy which was not included in this article but, like HD white-light endoscopy, is also associated with shorter procedure times than dye-based chromoendoscopy (though non-inferiority trials have not been conducted between virtual and dye-based chromoendoscopy). The study supports the use of HD white-light endoscopy with reinspection as a practical alternative given its non-inferiority for neoplasia detection. Importantly, neoplasia detection is still dependent on total withdrawal time, this has been validated across different studies among the general population (non-IBD patients). Therefore, we cannot rely solely on the inspection method alone and should avoid rushed examinations. Adequate withdrawal time remains essential for best lesion detection. White-light endoscopy does however offer the benefit of smoother logistics compared to dye-based endoscopy, which requires comfort with handling dye material and efficient communication between endoscopist and endoscopy staff. This added value will expand access to care for IBD patients to non-IBD experts, thus increasing equity.

For Future Research:

Since the initial planning for the HELIOS trial, HD virtual chromoendoscopy has been included in interval guidelines as summarized above. Future research should focus on comparing HD virtual chromoendoscopy with HD white-light endoscopy with reinspection and HD dye-based chromoendoscopy. There is promising work to be published soon to contribute to the current existing body of evidence on this topic, again suggesting that HD virtual chromoendoscopy can be a strong competing method for surveillance colonoscopy.[3] In addition, cost-effectiveness analysis comparing the different modalities of endoscopy in this patient population is warranted to help formulate stronger recommendations for guidelines on this important topic.

Conflict of Interest

Drs. Chaudhary and Al Kazzi reports no potential conflicts of interest related to this study.

Abbreviations

ACG, American College of Gastroenterology; CI, confidence interval; HD, high-definition; IBD, inflammatory bowel disease; OR, odds ratio; RCT, randomized controlled trial.

Note

The authors of this EBGI summary are active on social media. Tag them to discuss their work.

REFERENCES

1. Rubin DT, Ananthakrishnan AN, Siegel CA, Sauer BG, Long MD. ACG Clinical Guideline: Ulcerative Colitis in Adults. *Am J Gastroenterol* 2019;114(3):384-413.
2. Murthy SK, Feuerstein JD, Nguyen GC, Velayos FS. AGA Clinical Practice Update on Endoscopic Surveillance and Management of Colorectal Dysplasia in Inflammatory Bowel Diseases: Expert Review. *Gastroenterology* 2021;161(3):1043-1051.e4.
3. Radia C, King A, Harlow C, et al. OP13 Higher neoplasia detection rate and lower number of targeted biopsies associated with virtual chromoendoscopy in IBD surveillance: a real-world, multicentre UK study. *J Crohns Colitis*. 2025;19(Suppl 1):i27–i28.