Impact of fair bowel preparation quality on adenoma and serrated polyp detection: data from the New Hampshire Colonoscopy Registry by using a standardized preparation-quality rating

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Background: The effect of colon preparation quality on adenoma detection rates (ADRs) is unclear, partly because of lack of uniform colon preparation ratings in prior studies. The New Hampshire Colonoscopy Registry collects detailed data from colonoscopies statewide, by using a uniform preparation quality scale after the endoscopist has cleaned the mucosa.

Objective: To compare the overall and proximal ADR and serrated polyp detection rates (SDR) in colonoscopies with differing levels of colon preparation quality.

Design: Cross-sectional.

Setting: New Hampshire statewide registry.

Patients: Patients undergoing colonoscopy.

Interventions: We examined colon preparation quality for 13,022 colonoscopies, graded by using specific descriptions provided to endoscopists. ADR and SDR are the number of colonoscopies with at least 1 adenoma or serrated polyp (excluding those in the rectum and/or sigmoid colon) detected divided by the total number of colonoscopies, for the preparation categories: optimal (excellent and/or good), fair, and poor.

Main Outcome Measurements: Overall/proximal ADR/SDR.

Results: The overall detection rates in examinations with fair colon preparation quality (SDR 8.9%; 95% confidence interval [CI], 7.4-10.7, ADR 27.1%; 95% CI, 24.6-30.0) were similar to rates observed in colonoscopies with optimal preparation quality (SDR 8.8%; 95% CI, 8.3-9.4, ADR 26.3%; 95% CI, 25.6-27.2). This finding also was observed for rates in the proximal colon. A logistic regression model (including withdrawal time) found that proximal ADR was statistically lower in the poor preparation category (odds ratio 0.45; 95% CI, 0.24-0.84; $P < .01$) than in adequately prepared colons.

Limitations: Homogeneous population.

Conclusion: In our sample, there was no significant difference in overall or proximal ADR or SDR between colonoscopies with fair versus optimal colon preparation quality. Poor colon preparation quality may reduce the proximal ADR. (Gastrointest Endosc 2014;80:463-70.)

Abbreviations: ADR, adenoma detection rate; BMI, body mass index; CRC, colorectal cancer; NHCR, New Hampshire Colonoscopy Registry; SDR, serrated polyp detection rate.

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Colonoscopy is currently the most widely used screening test for colorectal cancer (CRC) prevention and early detection in the United States and is a critical part of recommended screening guidelines.[1,2] Prevention of CRC is accomplished through removal of potentially precancerous polyps, both adenomas and the more recently described sessile serrated polyps, before those lesions can progress to CRC. Patients are instructed to prepare for colonoscopy by drinking colon-cleansing fluids and restricting their diets for 24 hours before the procedure. Variable compliance with these instructions results in patients arriving for colonoscopy with colons in varying stages of preparation, ranging from excellent to poor. It seems reasonable to expect that detection of precancerous lesions during colonoscopy could be affected by the quality of the colon preparation.

However, little is known about outcomes based on the quality of colonoscopy preparation. For example, are more lesions detected in colonoscopies with optimal (excellent or good) preparation quality, or does suboptimal colon preparation differentially affect findings in the right or left side of the colon? A few studies have suggested that patients with suboptimal preparations may have a high rate of missed advanced adenomas.[3,4] However, lack of standardization for grading the quality of preparation has hindered investigation of the impact of suboptimal preparation.[5] For example, one study found similar adenoma detection rates (ADRs) in examinations with fair, good, and excellent bowel preparation, but there was no standardization in preparation quality[6] or in whether the preparation was graded before or after clearing of the colon. Another challenge has been the lack of information regarding related variables such as withdrawal time in studies examining colon preparation quality.[6] As a result, there are no clear recommendations regarding whether follow-up screening or surveillance intervals should be modified for examinations with suboptimal colon preparation. However, in practice, subsequent surveillance intervals are frequently shortened for patients with suboptimal colon preparation in order to address the greater potential for missed lesions than exists for patients with optimal (good or excellent) colon preparation.[7]

Inadequate or suboptimal colon preparation in the right side of the colon may partly explain the lack of protection from advanced neoplasia in the proximal versus the distal sections of the colon provided by colonoscopy.[8,9] It is unclear whether suboptimal colon preparation may disproportionately affect detection of serrated as opposed to adenomatous lesions. This may be especially true because sessile serrated adenomas, the more worrisome subset of these lesions, are often flat and proximally located.[10] These factors may play a role in the finding that interval cancers are more likely to be located proximally.[11] Clarification of the impact of suboptimal colon preparation by location, incorporating patient risk factors, will allow more specific and targeted responses to the persistent question of when to repeat tests for which the preparation was suboptimal (neither good nor excellent).

Take-home Message

- By using a standardized preparation quality rating, we observed that patients with fair colon preparation quality had proximal adenoma and serrated polyp detection rates similar to those with excellent or good preparation quality.

The New Hampshire Colonoscopy Registry (NHCR) is a population-based, statewide registry that collects comprehensive patient, procedure, and pathology information. Endoscopists complete a procedure form that provides a detailed description for each category of colon preparation quality and instructs endoscopists to grade the preparation according to the worst-prepared segment *after clearing*, providing consistent terminology among the diverse group of participating endoscopists. The NHCR assesses colonoscopy quality measures, including ADR and serrated polyp (subset that does not include those in the rectum or sigmoid) detection rate (SDR). Our aim in this analysis was to examine the overall as well as the proximal ADR and SDR for colonoscopies performed in patients with varying levels of colon preparation quality, particularly to compare detection rates in procedures with fair and optimal preparation quality, which previously have been reported to be similar.[6]

METHODS

The design and development of the NHCR is described in detail elsewhere.[12-14] Nearly all endoscopy sites in New Hampshire currently contribute data to the NHCR, with a few sites currently undergoing human subjects review and implementation. The NHCR is a registry used to generate evidence for multiple studies; therefore, there are no specific criteria for endoscopists in New Hampshire to participate in the registry. Consenting patients complete a self-administered patient questionnaire before colonoscopy, providing information on demographic characteristics, health history, and risk factors for CRC. On the NHCR procedure form, completed during or immediately after colonoscopy, endoscopists or endoscopy nurses record the indication for the colonoscopy (specific options within screening, surveillance, or diagnostic categories), findings (location, size, and specific treatment, if any, of polyps, cancer, or other findings), quality of colon preparation, sedation medication, colon region reached during the procedure, withdrawal time, follow-up recommendations, and immediate adverse events. The NHCR requests pathology reports for all colonoscopies, with findings directly from the pathology laboratory used by each participating endoscopy facility. Trained NHCR staff abstract data from