

High-Definition Colonoscopy Detects Colorectal Polyps at a Higher Rate Than Standard White-Light Colonoscopy

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BACKGROUND & AIMS: Adenoma detection rates might be improved through use of high-definition colonoscopy, which can detect subtle mucosal changes. We investigated whether the use of high-definition white-light (HDWL) colonoscopy resulted in a higher rate of adenoma detection than standard-definition white-light (SDWL) colonoscopy in a clinical practice setting. **METHODS:** This retrospective study included 2430 patients who underwent colonoscopies from September 2006 to December 2007; 1226 received SDWL colonoscopy and 1204 received HDWL colonoscopy. We analyzed data from consecutive screening, surveillance, and diagnostic colonoscopies, comparing adenoma and overall polyp detection between procedures. Potentially confounding variables were controlled using multivariable logistic regression analysis. **RESULTS:** The adenoma detection rate was higher among patients who underwent HDWL compared with SDWL colonoscopies (28.8% vs 24.3%; $P = .012$), as was the polyp detection rate (42.2% vs 37.8%; $P = .026$). These findings remained after adjustments for potentially confounding variables ($P = .018$ and $.022$, respectively). **CONCLUSIONS:** In a general clinical practice setting, HDWL colonoscopy resulted in a higher adenoma detection rate compared with SDWL colonoscopy. The use of SDWL colonoscopy could reduce the number of missed adenomas and the subsequent risk for colorectal cancer.

Keywords: Adenoma Detection; Colorectal Neoplasia.

Colon cancer is the fourth most common malignancy and the second leading cause of cancer-related death for men and women in the United States.¹ Colonoscopy has been instrumental in colon cancer prevention by detection and removal of adenomatous colon polyps. However, not all adenomatous polyps are identified during a colonoscopy. The overall false-negative (ie, miss) rate for colonic adenomas is estimated to be as high as 24%, according to studies of same-day, tandem colonoscopies.^{2,3}

Efforts to improve endoscopic detection of adenomatous polyps include changes to procedural methods (eg, increased inspection time and more concerted efforts to look behind colonic folds), and optical methods (eg, increased resolution and contrast of endoscopic systems).⁴ One recently introduced method is the high-definition (HD) imaging system that can be used with optical filters to selectively illuminate tissue with blue

light (HD narrow band imaging [NBI]) or without optical filters (HD white-light [HDWL]).

Our recent prospective randomized back-to-back trial of 100 patients compared adenoma miss rates between standard-definition white light (SDWL) colonoscopy and HD-NBI.⁵ In total, 177 polyps were detected and of these 40% were adenomatous. The polyp and adenoma miss rates for SDWL were 57% (60 of 105) and 49% (19 of 39), and the miss rates for NBI were 31% (22 of 72) and 28% (9 of 32) ($P = .005$ and $P = .047$) for polyps and adenomas, respectively. HD-NBI and SDWL had similar miss rates for identifying patients with polyps (6 of 35 [17.1%] vs 9 of 32 [28.1%]; $P = .27$) and adenomas (4 of 21 [19.0%] vs 8 of 20 [40.0%]; $P = .13$). The study showed that the miss rate for adenomas was lower with HD-NBI than with SDWL colonoscopy. This increased rate of adenoma detection in the HD-NBI group suggested that either the improved definition (high vs standard), or a combination of improved definition and the high contrast of NBI, resulted in lower adenoma miss rates. However, it was not clear from this study whether the improved adenoma detection in the HD-NBI group was owing to improved definition (high vs standard), or a combination of improved definition and the high contrast of NBI. It also was uncertain whether the improved adenoma detection, observed with HD systems in the setting of a controlled clinical trial, could be maintained in a routine practice setting. Therefore, we sought to determine whether the use of HD colonoscopes was associated with a higher rate of adenoma and polyp detection for average-risk colonoscopies in our outpatient general clinical practice setting.

Methods

Data Collection

The computerized clinical and endoscopic charts database of the Mayo Clinic Jacksonville served as a data source for this study, which was approved by the Mayo Clinic Institutional Review Board. We reviewed the computerized charts of patients who underwent colonoscopies between September 2006 and December 2007 in the outpatient general practice setting. Patient information was collected regarding age, sex, race, family history of colon cancer, history of polyps, and aspirin

Abbreviations used in this paper: CI, confidence interval; HDWL, high-definition white light; NBI, narrow band imaging; OR, odds ratio; SDWL, standard definition white light.

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