Clinical Gastroenterology and Hepatology 2015;13:739–746

Adjusting for Patient Demographics Has Minimal Effects on Rates of Adenoma Detection in a Large, Community-based Setting

Christopher D. Jensen, Chyke A. Doubeni, Virginia P. Quinn, Theodore R. Levin, Ann G. Zauber, Joanne E. Schottinger, Amy R. Marks, Wei K. Zhao, Jeffrey K. Lee, Nirupa R. Ghai, Jennifer L. Schneider, Bruce H. Fireman, Charles P. Quesenberry, and Douglas A. Corley

Kaiser Permanente Division of Research, Oakland, California

BACKGROUND & AIMS: **Reliable estimates of adenoma detection rates (ADRs) are needed to inform colonoscopy quality standards, yet little is known about the contributions of patient demographics to variation in ADRs. We evaluated the effects of adjusting for patient age, race/ethnicity, and family history of colorectal cancer on variations in ADRs and the relative rank order of physicians.**

METHODS: **In a retrospective cohort study, we collected data from Kaiser Permanente Northern California members who were ≥50 years old who received colonoscopies from 2006 through 2008. We evaluated ADRs (before and after adjustment for age, sex, race/ethnicity, and family history of colorectal cancer) for 102 endoscopists who performed 108,662 total colonoscopies and 20,792 screening colonoscopies. Adenomas were identified from the pathology database, and cancers were detected by using the Kaiser Permanente Northern California cancer registry.**

RESULTS: **About two-thirds of examiners had unadjusted ADRs for screening exams that met gastroenterology society guidelines (>25% for men and >15% for women), although rates of detection varied widely (7.7%−61.5% for male patients and 1.7%−45.6% for female patients). Adjusting for case mix reduced the variation in detection rates (from 8-fold to 3-fold for male patients and from 27-fold to 5-fold for female patients), but the median change in physician order by detection rate was just 2 ranks, and few physicians changed quartiles of detection. For example, only 3 of 102 endoscopists moved into and 3 out of the lowest quartile of ADR.**

CONCLUSIONS: **In a community-based setting, most endoscopists met the ADR standards, although there was wide variation in ADRs, which was similar to that reported from academic and referral settings. Case-mix adjustment reduced variability but had only small effects on differences in ADRs between physicians, and only a small percentage of physicians changed quartiles of detection. Adjustments to ADRs are therefore likely only needed in settings in which physicians have very different patient demographics, such as in sex or age. Moderate differences in patient demographics between physicians are unlikely to substantially change rates of adenoma detection.**

Keywords: Colon Cancer; Neoplasm; Polyp; Endoscopy.

Watch this article's video abstract and others at http://bit.ly/1C2wSLn.

Scan the quick response (QR) code to the left with your mobile device to watch this article's video abstract and others. Don't have a QR code reader? Get one by searching 'QR Scanner' in your mobile device's app store.

Colonoscopy is a commonly used primary or follow-up screening test to detect colorectal cancer (CRC),[1–3] the second leading cause of death from cancer in the United States.[4,5] Colonoscopy can reduce the risk of CRC mortality through detection of tumors at an earlier, more treatable stage and through removal of precursor adenomatous polyps.[1,2] Conversely, failure

Abbreviations used in this paper: ADR, adenoma detection rate; CRC, colorectal cancer; KPNC, Kaiser Permanente Northern California.

1542-3565/$36.00
http://dx.doi.org/10.1016/j.cgh.2014.10.020

to detect adenomas during colonoscopy may increase the subsequent risk of CRC.

Physician adenoma detection rate (ADR), the percentage of screening colonoscopies performed by a physician that detect at least 1 adenoma or adenocarcinoma, has been recommended as a quality benchmark by specialty societies[6,7] and has been proposed by the Centers for Medicare and Medicaid Services as a reportable quality measure. Currently, professional societies recommend ADRs of 15% or higher for female patients and 25% or higher for male patients as indicators of adequate colonoscopy quality[7]; however, reported detection rates have varied widely,[8–20] and this variability predicts subsequent risk of CRC and mortality.[21,22]

Prior studies have examined physician factors related to ADR variability; however, patients differ substantially in the prevalence of adenomas on the basis of their sex and age.[23–25] To our knowledge, no studies have examined the impact of adjusting for differences between physicians' patient populations (case mix) on ADRs. If such adjustment markedly influences detection rates, it may be required for accurate comparisons between physicians.

We evaluated ADR variability in a large group of endoscopists performing colonoscopies in a community-based setting and the impact of adjusting for differences in patient case mix.

Methods

Setting

The study was conducted among health plan members of Kaiser Permanente Northern California (KPNC), an integrated health services delivery organization serving approximately 3.3 million people across 21 medical centers and hospitals in urban, suburban, and semirural regions within a large geographic area. KPNC's membership demographics closely approximate the diverse underlying population of Northern California, as compared with census demographics, including members with Medicare, Medicaid (low-income), and commercial insurance; thus, studies within this setting provide results that can be generalized to a large region.[26,27] The study was approved by the KPNC institutional review board.

Use of Colonoscopy in Colorectal Cancer Screening

During the study time interval (2006–2008), KPNC used multi-modality CRC screening that included fecal blood testing, flexible sigmoidoscopy, and colonoscopy; the majority of patients were not screened by colonoscopy. For patients receiving colonoscopy, exams were performed at multiple medical centers throughout the region; most physicians performed their exams exclusively at one of these centers.

Colonoscopy Exposure Ascertainment

Colonoscopy records were retrieved from electronic databases by using Current Procedural Terminology codes.[28] Patients were included if they had a colonoscopy between January 1, 2006 and December 31, 2008 and were 50 years or older at the time of the examination. If a patient had more than 1 colonoscopy during this period, only the first was included. We included only exams performed by physicians with at least 300 total and 75 screening exams during the study period and excluded a small number of exams performed by physicians at facilities outside their regular service area.

Exam indication (screening vs non-screening) was assigned by using an algorithm that used information from referral, clinical, laboratory, pathology, radiologic, and diagnostic databases. Similar to other large screening studies,[29,30] exams performed on patients with a family history of CRC were classified as screening. Examinations were considered non-screening if any of the above-mentioned sources included evidence in the preceding 6 months of a diagnostic indication (eg, abdominal pain, iron deficiency anemia, gastrointestinal bleeding, overt blood in stools, unexplained weight loss, change in bowel habits, abnormal abdominal imaging, or diverticulitis); a prior colorectal adenoma or colon polyp; a history of CRC; an inflammatory bowel disease diagnosis within the previous 10 years; a colonoscopy within the previous 10 years; a sigmoidoscopy within the previous 5 years; or a positive test for stool hemoglobin within the previous 1 year. All other exams were assigned a screening indication.

Outcome Ascertainment

Adenomas were identified from the pathology database, and cancers were detected by using the KPNC cancer registry, which reports to the Surveillance, Epidemiology and End Results registry; these results were linked to colonoscopy exams. Because few patients had cancers, detection of adenomas and cancers is collectively referred to as adenoma detection.

Patient Demographics

Patient age, sex, race/ethnicity, and family history of CRC were obtained from electronic medical records.

Validation Studies

Validation studies were performed to evaluate the accuracy of the electronic data capture methods compared with results from manual chart abstractions of progress notes, pathology reports, and colonoscopy procedure reports. These evaluations confirmed a high level of agreement and/or sensitivity for capture of colonoscopy exam performance compared with manual