Colonoscopy Completion in a Large Safety Net Health Care System

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Background & Aims: **Anecdotally, patients in safety net health care systems have difficulty completing screening and diagnostic colonoscopies, but this is poorly characterized. It is important to understand this phenomenon to improve low rates of colorectal cancer screening in vulnerable populations and to ensure that patients with signs and symptoms complete medically indicated colonoscopic evaluations.** ***Methods:*** **We performed a 6-month retrospective review of outpatient endoscopy laboratory scheduling and procedure logs and electronic medical records at Denver Health Medical Center (DHMC), a large safety net health care system, to describe rates and sociodemographic predictors of colonoscopy nonattendance and inadequate (fair/poor) bowel preparation. Predictor variables included patient age, gender, race/ethnicity, procedure indication, and insurance type.** ***Results:*** **The nonattendance rate was 41.7% for all scheduled outpatient colonoscopies without difference between screening and diagnostic procedures. Consistent with non–safety net systems, the rate of inadequate bowel preparation was 30.2%; however, the rate of poor bowel preparation that absolutely precluded an exam was 9.9%. Correctional care patients had markedly higher rates of nonattendance and inadequate bowel preparation compared with other groups.** ***Conclusions:*** **A very large proportion of patients scheduled for colonoscopy in a large safety net health care system do not attend their procedures, and among those who do, there is a high rate of inadequate bowel preparation leading to incomplete and aborted evaluations. Interventions are needed to promote the more efficient use of a limited and expensive resource and to achieve higher rates of screening and medically indicated diagnostic colonoscopies in vulnerable patient populations.**

Colorectal cancer screening is a high-impact, cost-effective service used by less than half of persons aged 50 and older.[1] Among patients who are racial/ethnic minorities or socioeconomically disadvantaged, there is evidence that screening rates are substantially lower than in the general population.[2,3] Although debated, colonoscopy might be the most cost-effective screening modality because it is usually required at only 10-year intervals and is both a diagnostic and therapeutic procedure.[4] In low income, racial/ethnic minority groups, colonoscopy might be especially advantageous because adherence tends to be poor for more frequently required alternatives such as stool cards and flexible sigmoidoscopy. One of the most important barriers to colorectal cancer screening is the absence of a medical provider recommendation.[5] Thus, when medical providers do refer patients for screening colonoscopy, it is important to facilitate the completion of this procedure. Separately, patients with signs and symptoms should also complete referrals for medically indicated diagnostic colonoscopies.

Safety net health systems focus on delivering health care services to uninsured, Medicaid, and other vulnerable populations.[6] Poor and minority patients served by safety net health care systems often do not complete colonoscopies for which they have been referred and scheduled. In personal communication (endoscopy laboratory charge nurses: San Francisco General Hospital; Harborview Medical Center, Seattle; Cook County Hospital, Chicago; 2006), managers of endoscopy laboratories in several safety net health systems told us that their colonoscopy no-show rates are "very high." Although knowledgeable individuals have remarked on this phenomenon imprecisely and anecdotally, the problem of failed colonoscopies in safety net systems has not been systematically characterized. To encourage a formal approach to a problem whose origins and potential solutions are likely to have much in common across similar institutions, our objective was to identify rates and sociodemographic predictors of nonattendance and inadequate bowel preparation for all colonoscopy indications in our own large safety net system in Denver, Colorado.

Consistent with prior studies in non–safety net health care systems, we anticipated that nonattendance rates in our institution would be significantly higher among younger patients, women, those with no/low-income insurance, and possibly those of black and Latino race/ethnicity than among older patients, men, those with Medicare or commercial health plans, and non-Latino whites.[7–9] Also, possibly because of patient motivation, we expected that nonattendance would be significantly higher among patients scheduled for screening and surveillance compared with diagnostic procedures.[10] Little prior work has described correlates of inadequate bowel preparation.

Methods

Study Setting and Population

The study was carried out at Denver Health Medical Center (DHMC), a large community-based medical facility that serves more than 25% of Denver County residents. Fourteen

Abbreviations used in this paper: DHMC, Denver Health Medical Center; EGD, esophagogastroduodenoscopy; FOBT, fecal occult blood testing.

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percent of DHMC patients are black, and 54% are Latino. Approximately 65% of patients are below 185% of the federal poverty level, and uninsured patients account for 42% of all charges. DHMC also provides services for incarcerated patients in the City and County of Denver.

Screening and surveillance colonoscopies at DHMC are facilitated through direct referrals ("open-access") by primary care providers in general internal medicine and family practice; virtually no patients are referred for colonoscopy from outside the system. Although fecal occult blood testing (FOBT) is used most frequently for screening purposes, patients might be referred for colonoscopy after they repeatedly do not return FOBT cards, if they require a concomitant diagnostic esophagogastroduodenoscopy (EGD), if they express a strong preference for colonoscopy, or if primary care providers prefer colonoscopy over alternatives. Flexible sigmoidoscopy and barium enema are seldom carried out within DHMC. Because colonoscopy, on the other hand, is commonly scheduled, requires the greatest amount of preparation, and is the de facto gold standard for screening and diagnostic purposes, we chose to focus solely on this procedure rather than on other modalities that have distinct barriers to completion.

Almost all diagnostic colonoscopy referrals are also generated by primary care providers within the system, although these sometimes require a gastroenterologist consultation before colonoscopy is completed. After a gastroenterologist reviews the appropriateness of all colonoscopy referrals, these are forwarded to the endoscopy staff at DHMC, who schedule procedures after telephone contact with patients. Average wait time for nonurgent colonoscopy is approximately 6–8 weeks. Written reminders are not routinely sent to the patients; however, telephone reminders are attempted. At the time of referral, patients receive an instruction sheet (in English or Spanish, as appropriate) and a prescription for polyethylene glycol–based isosmotic peroral colonic lavage. The cost of this prescription is about $8.00 for most patients. For the vast majority of health plans, there is no co-payment for colonoscopy. Patients enrolled in the Colorado Indigent Care Program made the highest average co-payment amount of $40.

Data Sources and Variables

We carried out a 6-month retrospective review (January–June 2006) of outpatient-based endoscopy scheduling and procedure logs and electronic medical records at DHMC. Patients who did not arrive or cancelled their scheduled procedure with less than 2 work days notice were coded as nonattenders. The quality of bowel preparations was based on the Global Preparation Assessment Scale as follows: excellent (clear, water-like stool), good (semi-clear, liquid stool), fair (colored liquid or semisolid stool amenable to suction), and poor (semisolid or solid stool, not amenable to suction).[11] A priori, poor and fair preparations were regarded as inadequate. This information was recorded as a required field during endoscopist report generation immediately after the conclusion of procedures (endoPRO software; Pentax Medical Company, Golden, CO). Patient sex, age, race/ethnicity, and insurance type were extracted from the electronic medical record.

Statistical Analysis

Rates of colonoscopy nonattendance and inadequate bowel preparation were based on the total number of patients for whom these categories applied divided by the number of patients scheduled for and undergoing colonoscopy, respectively, during the specified time period. Only a patient's first scheduled colonoscopy was considered in the analysis; procedures that were rescheduled or repeated were ignored. We used χ^2 tests for categorical variables to characterize bivariate associations between nonattendance and inadequate bowel preparations, on the one hand, and patient sex, age, race/ethnicity, insurance type, and procedure indication, on the other. Multivariate odds ratios for nonattendance (versus attendance) were then calculated by retaining in a logistic regression model variables with a significance level of 0.25 or less in bivariate analysis.[12] All statistical procedures were performed with SAS Version 9.1 (SAS Institute, Cary, NC).

This study was approved by the Colorado Multiple Institutional Review Board after removal of personal health information.

Results

The final sample included 817 patients scheduled for outpatient colonoscopy. The overall nonattendance rate was 41.7% (Table 1). Less than 5% cancelled their procedures with less than 48 working hours notice; the vast majority simply did not arrive for the exam. Contrary to previously published observations, female sex, younger age, black and Latino race/ethnicity, and procedure indication were not associated with higher rates of nonattendance. However, attendance was significantly higher than average among patients referred for concomitant EGD and those with Denver Health Medical Plan (a health maintenance organization administered through Denver Health whose members are mainly composed of employees of Denver Health and Hospital Authority and the City and County of Denver and their dependents) and commercial insurance. Attendance was significantly lower than average among correctional care patients. Without difference by patient sex, age, race/ethnicity, payer, or procedure indication, the overall rate of poor bowel preparation was 9.9%, and of inadequate bowel preparation (poor/fair) it was 30.2%.

Discussion

Colonoscopy nonattendance was extremely high in almost all patient groups within a large safety net system. In addition, although 30.2% of patients who attended their appointments had an inadequate bowel preparation, consistent with a rate quoted in a recent meta-analysis of non–safety net systems,[13] the rate of poor (as opposed to fair) quality preparation was 9.9%, which guarantees that at least 1 in 10 patients could not complete any meaningful portion of an exam. Thus, when poor bowel preparation is considered concurrently with nonattendance, at least 51.6% (ie, more than half) of patients failed to successfully complete a procedure for which a significant amount of administrative processing had taken place and clinical resources had been set aside.

Rates of about 20% have been described for colonoscopy nonattendance for follow-up of positive FOBT in a Veterans Affairs setting [14] and less than 5% for all open-access indications at both the University of Colorado Hospital (personal communication, GI/Endoscopy manager; June 2007) and Mayo Clinic, Scottsdale.[15] The colonoscopy nonattendance rate of 41.7% at Denver Health is much higher than has been described for

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