Patterns of endoscopy in the United States: analysis of data from the Centers for Medicare and Medicaid Services and the National Endoscopic Database

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Background: Patterns of GI endoscopy are influenced by the underlying epidemiology of GI disease, as well as by policy and practice guidelines.

Objective: To compare practice patterns of GI endoscopy between two large national databases of the United States.

Design: Descriptive database analysis.

Setting: A 5% sample of the entire U.S. Medicare population (Centers for Medicare and Medicaid Services, CMS data files) and endoscopic data repository of U.S. gastroenterology practices (Clinical Outcomes Research Initiative, CORI database) from 1999 to 2003.

Patients: The study population included 1,121,215 Medicare and 635,573 CORI patients undergoing various types of GI endoscopy.

Interventions: EGD, colonoscopy, and flexible sigmoidoscopy.

Main Outcome Measurements: Patient demographics, endoscopic diagnoses, time trends of diagnoses.

Results: A colonoscopy was the most common endoscopic procedure performed (CMS 53%, CORI 58%), followed by an EGD (37%, 32%), and a flexible sigmoidoscopy (10%, 10%). In the CMS data, women accounted for 59% of the EGDs, 57% of the colonoscopies, and 56% of the flexible sigmoidoscopies, and in the CORI data, the corresponding numbers were 57%, 55%, and 54%, respectively. Compared with their distribution in the U.S. census population, nonwhite patients in both databases underwent relatively more EGDs and fewer colonoscopies. The most common upper-GI diagnosis was GERD, followed by GI bleeding, gastric ulcer, and duodenal ulcer. The most common lower-GI diagnosis was colorectal polyp. Over the period of 1999 to 2003, the rates of colorectal cancer diagnosed with colonoscopy declined.

Limitations: Only a limited amount of information about individual patients was retrievable from the electronic databases.

Conclusions: A colonoscopy is now the most common endoscopic procedure in the United States. Women undergo both upper and lower endoscopic procedures more often than men. Nonwhite patients are underrepresented in the use of colonoscopy relative to the prevalence of nonwhite persons in the U.S. population. Increased use of a colonoscopy for colon screening and surveillance has been associated with a decreased rate of cancer diagnosis. (Gastrointest Endosc 2008;67:489-96.)

Abbreviations: CMS, Centers for Medicare and Medicaid Services; CORI, Clinical Outcomes Research Initiative; ICD9, 9th revision of the International Classification of Diseases; SD, standard deviation; VA, Department of Veterans Affairs.

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Practice patterns of GI endoscopy are influenced by the underlying epidemiology of GI disease, new research findings, and the advancement of endoscopic techniques, as well as the development and implementation of new policies and practice guidelines. For instance, during the past 3 decades, the incidence and prevalence of peptic ulcer disease and gastric cancer have markedly declined,

whereas, the incidence and prevalence of GERD and esophageal adenocarcinoma have increased.[1,2] A significant change in policy occurred in January 1998 when Medicare began paying for colorectal cancer screening by using a colonoscopy once every two years in high-risk persons over the age of 50 years and an annual fecal occult blood test or a flexible sigmoidoscopy every 5 years in average-risk persons. In July 2001, Centers for Medicare and Medicaid Services (CMS) expanded payment to include a screening colonoscopy every 10 years for average-risk persons. Subsequently, multiple studies found that endoscopic procedures are efficacious and cost effective in preventing colorectal cancer.[3,4] The increased interest in using a colonoscopy to prevent colorectal cancer has been accompanied by the development of better colonoscopes and new means of sedating patients.[5,6]

The present study is focused on how such outside influences have shaped utilization of endoscopic procedures during recent years. We analyzed the utilization frequency of EGDs, colonoscopies, and flexible sigmoidoscopies, as well as the demographic characteristics of patients undergoing endoscopy in two large databases that cover the entirety of the United States. The specific aim of the present study was to compare practice patterns of GI endoscopy between two large national databases.

Capsule Summary

What is already known on this topic

- Endoscopy practice patterns are influenced by epidemiology of GI disease, research findings, technical advances, and the development and implementation of new policies and practice guidelines.

What this study adds to our knowledge

- Analysis of 5-year Medicare and Clinical Outcomes Research Initiative data related to various types of GI endoscopy revealed that colonoscopy is the most commonly performed procedure for GI hemorrhage; as an increasing number of procedures are undertaken to prevent cancer, the overall diagnostic yield has declined.

MATERIALS AND METHODS

Two separate databases were used for the present analysis: the Medicare 5% Carrier Standard Analytic File and the national endoscopic database (Clinical Outcomes Research Initiative [CORI] database). The first database was obtained from the Centers for Medicare and Medicaid Services (CMS), which provides access to Medicare data for epidemiologic research. The Medicare 5% Carrier Standard Analytic File is a representative 5% sample of all final action claims for physician/supplier Part B services for all settings of care among Medicare beneficiaries. The second database originated when the American Society for Gastrointestinal Endoscopy initiated the CORI to develop a database of endoscopic procedures. The database was designed to store records from GI endoscopy procedures that reflect current endoscopic practice among a diverse sample of gastroenterologists distributed throughout the United States. Data from these two separate sources were used to compare the demographic characteristics of subjects who underwent various types of endoscopic procedures in the United States between 1999 and 2003. Separate data sets from the 5 consecutive years 1999 to 2003 were used in an attempt to identify any characteristic time trends.

For each study year, the total number of EGDs, colonoscopies, and flexible sigmoidoscopies were extracted from the two databases. The numbers of endoscopies were analyzed by patient age, sex, and race (white vs nonwhite). U.S. census data from the year 2000 were used to compare characteristics of the U.S. endoscopic patient population to the overall U.S. population.[7-9] Because a majority of CMS patients are over the age of 65 years, we performed a similar comparison to the U.S. population aged 65 years and older. During the period 1999 to 2003, 92 different practice sites, distributed throughout the United States, contributed endoscopic data to the CORI database. Nine of the CORI practice sites were located at hospitals of the Department of Veterans Affairs (VA). The patients covered by the CMS files were treated almost exclusively in nonfederal medical facilities.

For each endoscopic procedure, a frequency distribution was performed to identify the 20 most frequently used codes of the 9th revision of the International Classification of Diseases (ICD9). In addition, the individual ICD9 codes for the following specific diagnoses associated with an EGD were extracted from the databases: GERD (530.10, 530.11, 530.2, 530.3, 530.81, and 530.85), esophageal cancer (150 and 151.0), gastric cancer (151), gastric ulcer (531), duodenal ulcer (532), and GI hemorrhage. Similarly for a colonoscopy and a flexible sigmoidoscopy, the individual codes were aggregated for the following specific diagnoses: colorectal cancer (153 and 154), colorectal polyps (211.3, 2.11.4, and V12.72), Crohn's disease (555), ulcerative colitis (556), and GI hemorrhage. The ICD9 allows for a large ambiguity on how to code for various forms of GI hemorrhage. Separate codes can be used to describe iron-deficient anemia (280.0 and 280.9), hematemesis, melena, or hematochezia (569.3 and 578), irrespective of their underlying bleeding source, such as esophageal varices, a Mallory-Weiss tear, arteriovenous malformations, diverticular bleeding, hemorrhoidal bleeding, or an unspecified source of the GI tract. Moreover, bleeding can appear as an indication or a diagnosis for endoscopy. For the purpose of the present analysis, therefore, all these types of listings were combined.