

Appropriateness of Colonoscopy in a University Hospital

Y M Tan, MRCP, K L Goh, MD

Division of Gastroenterology, Department of Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur

Summary

An open access endoscopy system allows for the direct scheduling of endoscopies by non-gastroenterologist physicians without prior gastroenterology consultation. The aim of our study was to examine our practice of open access endoscopy by evaluating the appropriateness of referrals for colonoscopy and to determine whether there were differences depending on the specialty of the referring clinician.

The indication for colonoscopy was assessed in 499 consecutive outpatients referred for colonoscopy at University Hospital, Kuala Lumpur over a 12-month period. The American Society of Gastrointestinal Endoscopy (ASGE) guidelines were used to determine the appropriateness of referrals.

80.6% of colonoscopies requested by the gastroenterologist were performed for accepted indications compared to 50.6% of referrals by the primary care physician ($p<0.001$) and 67.0% of referrals by the surgeon ($p=0.006$). The rate of colonoscopies generally not indicated was 2.1% for the gastroenterologist, 25.0% for the internist ($p=0.002$) and 7.5% for the surgeon ($p=0.04$). The rate of indications not listed in the ASGE guidelines was significantly lower for requests made by gastroenterologists (17.3%) than those requested by primary care physicians (44.2%; $p<0.001$).

Patients who have had prior consultation with the gastroenterologist were significantly more likely to undergo colonoscopy for appropriate indications than among patients who were referred through an open access system. The rate of inappropriate indications for colonoscopy was also significantly lower when the gastroenterologist made the referral. A substantial proportion of colonoscopies (25.4%) was performed for indications not listed in the ASGE guidelines.

Key Words: Appropriateness, Colonoscopy, Open-access, Indication, Guidelines

Introduction

The open-access gastrointestinal endoscopy system was established at University Hospital, Kuala Lumpur in the early 1990's. This service allows the non-gastroenterologist physician within our hospital to schedule upper and lower gastrointestinal (GI) endoscopies directly without the need for the patient to have prior consultation with the gastroenterologist at the

GI clinic. The potential advantages of such a service is to enable the referring physician to provide continuity of care of their patients with uncomplicated diseases, to decrease health care costs by decreasing the number of unnecessary referrals to the GI clinic and to facilitate the prompt diagnosis of significant GI disease.

The use of colonoscopy is on an upward trend and in many instances has replaced barium enema as the initial

This article was accepted: 18 June 2003

Corresponding Author: Tan Yen Mei, Division of Gastroenterology, Department of Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur

examination in the assessment of the colon and rectum^{1,2}. Over-utilisation of a procedure that has become widely available is a potential issue of increasing concern to the provision of health care and would be detrimental in the increasingly cost-conscious environment. Furthermore, colonoscopy is associated with a small but definite rate of complications^{3,4}. It is mandatory therefore to weigh the risks and benefits of colonoscopy for a given patient, which is of utmost importance in defining the appropriate use of the procedure⁵. The RAND Corporation considered a procedure to be appropriate if the benefits derived from its application exceeded the expected negative consequences by a sufficiently wide margin to make the procedure worth doing⁶. Specific guidelines on the appropriate indications for GI endoscopy have been published by the American Society for Gastrointestinal Endoscopy (ASGE)^{7,8}. Similarly, guidelines have also become available from Europe^{9,10,11}.

The purpose of our study was to evaluate the open-access endoscopy system at our hospital by assessing the appropriateness of referrals for colonoscopy and by determining whether there were differences depending on the specialisation of the referring clinician.

Materials and Methods

The system of open-access endoscopy at our establishment permits the request for colonoscopy on outpatients to be made by primary care physicians, internists and surgeons in addition to the gastroenterologists. A standard form is completed by all referring clinicians with details of the demographic data and the reasons for referral. These forms are presented to our endoscopy receptionist who then schedules the procedure. Colonoscopies requested by non-gastroenterologists are performed without prior examination or evaluation by a gastroenterologist unless there are contraindications to doing the procedure. All procedures are performed by gastroenterologists and surgeons who were experienced endoscopists or by trainees under supervision.

A retrospective study was conducted on consecutive outpatients referred for colonoscopy over a 12-month period between January and December 2000. Demographic data, indications for colonoscopy, specialty of referring clinician and the endoscopic findings were recorded. The ASGE guidelines were used to determine the appropriateness of referrals.

Statistical analysis was performed using the Fisher exact test for comparisons between groups. A *p* value of < 0.05 for difference was considered significant.

Results

There were 499 open-access referrals for colonoscopy within the 12-month study period. These referrals were from the following specialties: 267 from the surgeons, 139 from gastroenterologists, 77 from primary care physicians and 16 from internists. The mean age of the study population was 55.9 ± 14.8 years. There were 251 males and 248 females.

There were no referrals for a condition where colonoscopy was contraindicated. No procedure related complications were encountered in our series. Overall, the indication for colonoscopy was appropriate using the ASGE guidelines in 341 (68.3%) patients. The most frequent generally indicated referral for colonoscopy was for evaluation of unexplained gastrointestinal bleeding (31.7%) followed by surveillance after colorectal cancer or neoplastic polyp resection (26.7%) and irritable bowel syndrome or chronic abdominal pain: colonoscopy done once to rule out organic disease (14.4%) (Table I). There were 31 (6.2%) cases that were considered generally not indicated according to the ASGE guidelines and 127 (25.4%) procedures were performed for an indication not listed in the ASGE guidelines. The list of colonoscopies not indicated and indications not listed in the ASGE is shown in Table II. The most frequent generally not indicated indications were surveillance after resection of colonic polyps or cancer at different intervals from those recommended and metastatic adenocarcinoma of unknown primary site in the absence of colonic signs or symptoms when it will not influence management. The commonest unlisted indication was altered bowel habit (70.1%).

Table III shows the frequency of procedures that were performed for appropriate, not indicated and not listed indications according to the four different specialty groups of referring clinicians. Significant differences existed when pair-wise comparisons were made with reference to the gastroenterologists. A large majority (80.6%) of colonoscopies requested by the gastroenterologist were performed for appropriate indications compared to 50.6% of referrals by the primary care physician (*p*<0.001) and 67.0% of referrals by the surgeon (*p*=0.006). The rate of colonoscopies generally not indicated according to ASGE guidelines was 2.1% for the gastroenterologist, 25.0% for the

internist ($p=0.002$) and 7.5% for the surgeon ($p=0.04$). The majority of requests made by the surgeons and internists (15 of 24) that were not indicated comprised referrals for surveillance of previous colonic polyps or cancer at non-recommended intervals. The rate of

indications not listed in the ASGE guidelines was significantly lower for requests made by gastroenterologists (17.3%) than those requested by primary care physicians (44.2%; $p<0.001$).

Table I: Colonoscopies Performed for Appropriate Indications

| Indication | n | % |
|--|-----|------|
| Evaluation of unexplained gastrointestinal bleeding | 108 | 31.7 |
| Surveillance after colorectal cancer or neoplastic polyp resection, within 1 year and then at 3- to 5-year intervals | 91 | 26.7 |
| Irritable bowel syndrome or chronic abdominal pain: colonoscopy done once to rule out organic disease | 49 | 14.4 |
| Clinically significant diarrhoea of unexplained origin | 31 | 9.1 |
| IBD, if a more precise diagnosis or determination of the extent will influence management | 16 | 4.7 |
| Patients with a 1st degree relative or multiple family members with colon cancer | 15 | 4.4 |
| Evaluation of an abnormal barium enema or other imaging study likely to be clinically significant | 10 | 2.9 |
| Pancolitis >7-year duration for surveillance of cancer | 6 | 1.7 |
| Left-sided colitis >10-year duration for surveillance of cancer | 5 | 1.5 |
| Unexplained iron deficiency anaemia | 5 | 1.5 |
| Excision of colonic polyp | 2 | 0.6 |
| Screening of asymptomatic, average risk patients for colonic neoplasia | 1 | 0.3 |
| Other | 2 | 0.6 |
| Overall | 341 | 100 |

Table II: Colonoscopies Performed for Generally Not Indicated and Unlisted Indications

| Indication | n | % |
|---|-----|------|
| GENERALLY NOT INDICATED ACCORDING TO ASGE GUIDELINES | | |
| Surveillance after resection of colonic polyps or cancer at different intervals from those recommended (within 1 year and then at 3- to 5-year intervals) | 18 | 58.1 |
| Metastatic adenocarcinoma of unknown primary site in the absence of colonic signs or symptoms when it will not influence management | 8 | 25.8 |
| Acute diarrhoea | 3 | 9.7 |
| Upper GI bleeding or melaena with a demonstrated upper GI source | 2 | 6.4 |
| Overall | 31 | 100 |
| NOT LISTED IN THE ASGE GUIDELINES | | |
| Altered bowel habit | 89 | 70.1 |
| Chronic constipation | 13 | 10.2 |
| Asymptomatic increase in serum carcinoembryonic antigen levels | 10 | 7.9 |
| Others | 15 | 11.8 |
| Overall | 127 | 100 |

Table III: Frequency of Colonoscopies Performed for Appropriate, Generally Not Indicated or Unlisted Indications According to the Referring Clinician

| Referring Clinician Indication for Colonoscopy | Appropriate | | | Generally not indicated | | | Not listed | | |
|--|-------------|--------|--------|-------------------------|--------|-------|------------|--------|--------|
| | n | (%) | p* | n | (%) | p* | n | (%) | p* |
| Gastroenterologist | 112/139 | (80.6) | | 3/139 | (2.1) | | 24/139 | (17.3) | |
| Surgeon | 179/267 | (67.0) | 0.005 | 20/267 | (7.5) | 0.04 | 68/267 | (25.5) | 0.1 |
| Primary care physician | 39/77 | (50.6) | <0.001 | 4/77 | (5.2) | 0.3 | 34/77 | (44.2) | <0.001 |
| Internist | 11/16 | (68.8) | 0.3 | 4/16 | (25.0) | 0.002 | 1/16 | (6.2) | 0.5 |

* vs gastroenterologist

Discussion

How appropriate we are at scheduling a specific examination or treatment gives an assessment of the quality of medical care provided¹². There is relative paucity of data on the appropriateness of use of colonoscopy when compared to upper gastrointestinal endoscopy^{13,14,15,16,17,18}. In our study, the appropriateness of referrals for colonoscopy in an open-access system was evaluated in out-patients using the ASGE criteria. In the 499 patients that were evaluated, the indications were appropriate in 68.3% cases. Our finding is consistent with the study from Italy¹⁹ and Switzerland¹⁰ with percentages of 63.9% and 72.2% respectively. The rate of accepted indications was significantly higher when the gastroenterologist made the referral compared to the primary care physician and the surgeon.

Inappropriate use of colonoscopy in our series was low (6.2%) which is in contrast to previous studies^{10,13,20}. Froehlich et al¹⁰ reported that colonoscopy was not indicated in 28% of cases as judged by ASGE criteria. The surgeons and internists were significantly more likely to schedule colonoscopies that were generally not accepted compared to gastroenterologists. The reason of this observation can be explained by differences in the patient population treated by the different groups of clinicians. Most of the generally not indicated examinations comprised referrals for colonoscopic surveillance in patients who have had previous colorectal cancer resection at intervals other than those recommended. The surgeons and internists

(predominantly oncologists) provided follow up for the majority of these patients, which skewed the results in favor of the gastroenterologist.

A substantial number of colonoscopies (25.4%) in our study were performed for indications not listed in the ASGE guideline. This finding is much higher than the study from Italy¹⁹ but corresponds to the study from Switzerland¹⁰. Referrals for an unlisted indication were significantly higher when the referring clinician was a primary care physician versus the gastroenterologist. The most frequent unlisted indications were altered bowel habit and chronic constipation. As suggested by the two previous studies and confirmed by ours, the ASGE guidelines for the appropriate use of colonoscopy appears to be insufficiently detailed in the assessment of many clinical scenarios that clinicians are faced with in clinical practice. Further study is needed to determine whether these indications should be addressed or included in subsequent versions of these guidelines¹⁹.

In conclusion, although adherence to practice guidelines does occur in an open-access system, strategies need to be developed to promote greater awareness of the existence of consensus guidelines for procedure indications among non-gastroenterologist physicians. Our study confirms that re-education is necessary for certain indications in particular the appropriate colonoscopic follow-up interval in patients with previous colorectal cancer or polyps, especially among surgeons.

References

1. Karasick S, Ehrlich SM, Levin DC, et al. Trends in use of barium enema examination, colonoscopy, and sigmoidoscopy: is use commensurate with risk of disease? *Radiology* 1995; 195: 777-84.
2. Scott B. Endoscopic demands in the 90's. *Gut* 1990; 31: 125-6.
3. Arrowsmith JB, Gerstman BB, Fleischer DE, et al. Results from the American Society for Gastrointestinal Endoscopy/U.S. Food and Drug Administration collaborative study on complication rates and drug use during gastrointestinal endoscopy. *Gastrointest Endosc* 1991; 37: 421-7.
4. Sieg A, Hachmoeller-Eisenbach U, Eisenbach T. Prospective evaluation of complications in outpatient GI endoscopy: A survey among German gastroenterologists. *Gastrointest Endosc* 2001; 53: 620-7.
5. Froehlich F, Gonvers JJ, Vader JP, et al. Appropriateness of gastrointestinal endoscopy: risk of complications. *Endoscopy* 1999; 31: 684-6.
6. Brook RH, Park RE, Chassin MR, et al. Predicting the appropriate use of carotid endarterectomy, upper gastrointestinal endoscopy, and coronary angiography. *N Eng J Med* 1990; 323: 1173-7.
7. American Society for Gastrointestinal Endoscopy. *Appropriate use of gastrointestinal endoscopy*. Manchester (MA): American Society for Gastrointestinal Endoscopy; 1992.
8. *Appropriate use of gastrointestinal endoscopy*. Manchester (MA): American Society for Gastrointestinal Endoscopy; 1997.
9. Quine MA, Bell GD, McCloy RF, et al. Appropriate use of gastrointestinal endoscopy: a prospective audit. *Gut* 1994; 35: 1209-14.
10. Froehlich F, Pache I, Burnand B, et al. Performance of panel-based criteria to evaluate the appropriateness of colonoscopy: a prospective study. *Gastrointest Endosc* 1998; 48: 128-36.
11. Burnand B, Vader JP, Froehlich F, et al. Reliability of panel-based guidelines for colonoscopy: an international comparison. *Gastrointest Endosc* 1998; 47: 162-6.
12. Chassin MR, Kosecoff J, Park RE, et al. Does inappropriate use explain geographic variations in the use of health care services? A study of three procedures. *JAMA* 1987; 258: 2533-7.
13. Kahn KL, Kosecoff J, Chassin MR, et al. The use and misuse of upper gastrointestinal endoscopy. *Ann Intern Med* 1988; 109: 664-70.
14. Gonvers JJ, Burnand B, Froehlich F, et al. Appropriateness and diagnostic yield of upper gastrointestinal endoscopy in an open-access endoscopy unit. *Endoscopy* 1996; 28: 661-6.
15. Minoli G, Prada A, Gambetta G, et al. The ASGE guidelines for the appropriate use of upper gastrointestinal endoscopy in an open access system. *Gastrointest Endosc* 1995; 42: 387-9.
16. Quine MA, Bell GD, McCloy RF, et al. Appropriate use of upper gastrointestinal endoscopy--a prospective audit. Steering Group of the Upper Gastrointestinal Endoscopy Audit Committee. *Gut* 1994; 35: 1209-14.
17. Adang RP, Vismans JF, Talmon JL, et al. Appropriateness of indications for diagnostic upper gastrointestinal endoscopy: association with relevant endoscopic disease. *Gastrointest Endosc* 1995; 42: 390-7.
18. Froehlich F, Burnand B, Pache I, et al. Overuse of upper gastrointestinal endoscopy in a country with open-access endoscopy: a prospective study in primary care. *Gastrointest Endosc* 1997; 45: 13-9.
19. Minoli G, Meucci G, Bortoli A, et al. The ASGE guidelines for the appropriate use of colonoscopy in an open access system. *Gastrointest Endosc* 2000; 52: 39-44.
20. Mahajan RJ, Barthel JS, Marshall JB. Appropriateness of referrals for open-access endoscopy. How do physicians in different medical specialties do. *Arch Intern Med* 1996; 156: 2065-9.