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Original Research Article

Observational study of appropriateness of colonoscopy using appropriateness criteria designed by EPAGE

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ABSTRACT

Background: To evaluate the appropriateness of colonoscopy for various common indications observed in day to day outpatient and inpatient general surgical practice as per criteria devised by expert panel of EPAGE 2.
Methods: Appropriateness score for indication of colonoscopy was calculated from EPAGE official website and the colonoscopy findings were verified against appropriateness score. The effect of various parameters like age, sex, duration of symptoms and referring doctor individually on both EPAGE score as well as colonoscopy results was verified.
Results: In our study, we found that only age of patient statistically affects EPAGE score. We also found that there is correlation between EPAGE score and colonoscopy results.
Conclusions: As age of patient increases likelihood of getting a significant EPAGE score increases while other parameters like sex, duration of symptoms, referring physicians did not affect EPAGE score in our study. The probability of getting positive findings on colonoscopy increases if the indication of colonoscopy is proved appropriate by EPAGE. All other parameters did not affect the colonoscopy findings in our study.

Keywords: Appropriateness, Colonoscopy, Endoscopy

INTRODUCTION

Colonoscopy or coloscopy is the endoscopic examination of the large bowel and the distal part of the small bowel.[1]

Colonoscopy is an endoscopic examination which enables accurate location of lesions and obtaining biopsies. Most conditions that affect the lower gastrointestinal tract can be diagnosed by colonoscopy, and some therapeutic procedures may be performed simultaneously.[2]

"Appropriateness was defined to mean that the expected health benefit exceeds the expected negative consequences (risks) by a sufficiently wide margin that gastroscopy or colonoscopy, respectively, is worth performing." [3]

A colonoscopy was defined as being appropriate if the expected health benefits outweighed the expected negative consequences by a sufficiently wide margin that the procedure was worth doing. A colonoscopy was defined as being necessary if the benefits were so significant that colonoscopy was the only ethical choice.[4]

The demand for gastrointestinal endoscopy is increasing in most countries, resulting in an important rise in overall costs and waiting lists for endoscopic procedures. Therefore, adherence to appropriate indications for these procedures is essential for the rational use of finite resources in an open-access system the appropriateness of

colonoscopy performance can reduce overuse, improve quality of care and decrease costs.

Defining strong criteria for the appropriateness of endoscopic procedures is therefore needed to face the health care demand of the population and the government to reduce costs. The procedure is expensive and associated with a low but significant rate of complications.[5]

These circumstances have led to the establishment of specific criteria on the indication for gastrointestinal endoscopy. Recently, the European Panel on the Appropriateness of Gastrointestinal Endoscopy (EPAGE) has developed a validated guideline, available through the Internet, for the appropriate use of colonoscopy.[6,5]

METHODS

Study was conducted in single teaching hospital in Mumbai, over a period of 1 year. The indication and results of diagnostic colonoscopy was studied on prospective basis on 100 patients. Patients were selected on the basis of definition for each indication.

Patients were selected on the basis of history, clinical examination, radiological investigations and prior endoscopy. The detailed data for every colonoscopy including history, clinical examination, blood investigations, stool investigations, radiological investigations were obtained detailed history regarding prior colonoscopies and their indications and results for each patient was noted.

Appropriateness score for indication of each colonoscopy was established according to the EPAGE score using the web-based scoring system (http://www.epage.ch).[3] EPAGE-II criteria classify indications for colonoscopy into 11 sections, which are scored from 1 (extremely inappropriate) to 9 (extremely appropriate) depending on clinical indication, age, personal and family history.

These criteria classify appropriateness of colonoscopy into 3 possible categories: appropriate (≥7), uncertain (4–6), and inappropriate (≤3).[7] Besides the classification according to the EPAGEII criteria, the variable appropriateness of colonoscopy was transformed into a dichotomous variable, with a cut-off point of 7 (<=6 inappropriate request; >=7 appropriate request). The colonoscopy results were verified against all parameters and statistical tests are applied. Similarly, EPAGE scores for every colonoscopy indication were verified against all parameters, statistical tests applied, and results obtained. The EPAGE scores were verified against colonoscopy findings statistical tests applied and results were obtained.

RESULTS

Present study was conducted in single teaching hospital in Mumbai. About 100 patients from outpatient and inpatient department were included. 66% patients were male and rest 34% were females.

Table 1: Age of patients and EPAGE appropriateness scores cross tabulation.

			Appropriateness as per EPAGE			Total
			Appropriate	Inappropriate	Uncertain	
Age	<30	Count	7	11	4	22
		% within age	31.8%	50.0%	18.2%	100.0%
		% within appropriateness as per EPAGE	10.9%	42.3%	40.0%	22.0%
		% of Total	7.0%	11.0%	4.0%	22.0%
	>30	Count	57	15	6	78
		% within age	73.1%	19.2%	7.7%	100.0%
		% within appropriateness as per EPAGE	89.1%	57.7%	60.0%	78.0%
		% of Total	57.0%	15.0%	6.0%	78.0%
Total		Count	64	26	10	100
		% within age	64.0%	26.0%	10.0%	100.0%
		% within appropriateness as per EPAGE	100.0%	100.0%	100.0%	100.0%
		% of Total	64.0%	26.0%	10.0%	100.0%

From this it can be concluded that as age of patient increases the EPAGE appropriateness score increases and this association can be statistically proven by chi square test

59% of patients were in the age group of 30-60yrs, 18% were in the age group of >60yrs, 22% were in the age group of <30 yrs. Out of all indications of colonoscopy lower abdominal symptoms was the most common indication accounting for 46% of patients, hematochezia ranked second with 17% while uncomplicated diarrhea ranked third with 16% patients. Of all the indications of colonoscopy 64% indications were appropriate, 26% were inappropriate and rest 10% were uncertain. We got positive findings in 61% of colonoscopies and 39% negative colonoscopies. 52% of colonoscopies were referred by residents and 48% were referred by faculty.

46% patients have symptoms duration <3 months while 54% have duration of symptoms >3 months.In present study, 31.8% of colonoscopies done in <30 yrs of age were appropriate as per EPAGE while 73.1% of the colonoscopies done in >30yrs were appropriate, Also in 64 patients with appropriate indication of colonoscopy about 10.9% were <30 years of age and about 89.1% patients were >30 years of age which gave us statistically significant relationship between age of patient and appropriateness as per EPAGE as shown in table 1. This association between age of patient and EPAGE score has been proven statistically in prior studies.[8]

Table 2: EPAGE appropriateness scores and colonoscopy findings obtained after colonoscopy cross tabulation.

Appropriateness score as per EPAGE		Colonoscopy result		Total
		Negative	Positive	
Appropriate	Count	20	44	64
	% within EPAGE appropriateness	31.3%	68.8%	100.0%
	% within colonoscopy result	51.3%	72.1%	64.0%
	% of Total	20.0%	44.0%	64.0%
Inappropriate	Count	12	14	26
	% within EPAGE appropriateness	46.2%	53.8%	100.0%
	% within colonoscopy result	30.8%	23.0%	26.0%
	% of Total	12.0%	14.0%	26.0%
Uncertain	Count	7	3	10
	% within EPAGE appropriateness	70.0%	30.0%	100.0%
	% within colonoscopy result	17.9%	4.9%	10.0%
	% of Total	7.0%	3.0%	10.0%
Total	Count	39	61	100
	% within EPAGE appropriateness	39.0%	61.0%	100.0%
	% within colonoscopy result	100.0%	100.0%	100.0%
	% of Total	39.0%	61.0%	100.0%

From this table it can be concluded that chances of obtaining positive finding on colonoscopy increases if the indication of colonoscopy is appropriate by EPAGE criteria. The association can be statistically proven using chi square test

In present study 53.8% of colonoscopies approved inappropriate by EPAGE got positive findings while 68.8% of the colonoscopies approved appropriate by EPAGE got positive findings on colonoscopy which gave us statistically significant relationship between EPAGE score and colonoscopy findings as shone in Table 2. This association between EPAGE score and colonoscopy result has been proved statistically significant in prior studies.[9]

In contrast to other studies we could not obtain statistically significant relationship between age of patient and colonoscopy results as out of 22 patients < 30 years of age 40.9% had positive result on colonoscopy and out of 78 patients >30 years of age 66.7% had positive results on colonoscopy. Also, out of 61 patients with positive colonoscopy 85.2% were >30 years of age and only 14.8% are <30 years of age. But this association could not be proved statistically significant.[10,11]

Association between other parameters like sex of patient, duration of symptoms, referring doctor and both colonoscopy findings as well as EPAGE score could not be elicited statistically significant. Differences among specialties have been noted by other authors as well as in previous studies evaluating appropriateness of upper gastrointestinal endoscopy.[12-15] In some studies it has been shown that male sex is associated with colonic lesion.[11,16]

DISCUSSION

Colonoscopy is an expensive procedure and is not free from complications. In order to increase cost effectiveness, reduce waiting lists and optimize resources, it is important to ensure the right appropriateness of these procedures. Improving appropriateness results in improved diagnostic yield and a reduction in the number of unnecessary procedures, thereby lowering the risk of complications, especially in healthy subjects. For these reasons, it is necessary to use tools such as the EPAGE II guidelines, which establish criteria for evaluating the indication of colonoscopies.[9]

The Internet was generally considered to offer great potential to vehicle clinical practice guidelines, and the usefulness and relevance of the EPAGE Internet guideline were considered acceptable. The overall impression and use of the EPAGE Internet guideline were very promising. Access to the website was considered easy and the time required was acceptable

In present study, about 100 cases were studied and the parameters like age, sex duration of symptoms,

appropriateness as per EPAGE, referring doctor are compared with colonoscopy results. We analyzed our results statistically using Pearson's chi square test.

The main factors according to several authors influencing the proportion of appropriate colonoscopy were patients older age, specialty of gastroenterologist and indication of the colonoscopy itself.[17-19] From present study it can be concluded that the appropriateness of colonoscopy increases as age of patient increases especially when associated with risk factors and if previous lower GI investigation has not been done. Also, the results of colonoscopy are likely to be positive if the indication of colonoscopy is proved appropriate by EPAGE 2 guidelines available widely on Internet at epage.ch website.

As age increases, the incidence of positive finding on colonoscopy increases but the association between age and colonoscopy results cannot be proven statistically in present study. Thus, from present study, it is clear that EPAGE scoring can be used to determine the appropriateness of the indication of colonoscopy in our clinical setting. However, it would be unwise, even wrong, in some cases to base the decision of procedure solely on the basis of such score. EPAGE score can be a promising tool to avoid unnecessary colonoscopies especially in younger individuals. Also, it would be helpful to avoid unnecessary work load over the healthcare providers at public hospitals.

CONCLUSION

As age of patient increases likelihood of getting a significant EPAGE score increases while other parameters like sex, duration of symptoms, referring physicians did not affect EPAGE score in present study. The probability of getting positive findings on colonoscopy increases if the indication of colonoscopy is proved appropriate by EPAGE. All other parameters did not affect the colonoscopy findings in present study.

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