

Quality of Colonoscopy and Spectrum of Lower Gastrointestinal Disease as Determined by Colonoscopy

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ABSTRACT

Objective: To document the quality of colonoscopy practice and the pattern of colonic disease including polyp detection rate at Shifa International Hospital, Islamabad, Pakistan.

Study Design: An observational study.

Place and Duration of Study: Shifa International Hospital, Islamabad, Pakistan, from May 2013 to June 2014.

Methodology: This retrospective study recorded demographics of patients, indications and quality indices of 505 colonoscopies performed during the study period. Preparation was done with low residue diet and polyethylene glycol. Conscious sedation was generally used. Quality indices studied were compared with guideline standard.

Results: Out of 505 colonoscopy patients, 305 were males and 200 were females. The indications for colonoscopic examination were lower gastrointestinal bleeding (26.5%, n=134), screening for colorectal cancer (14.1%, n=71), chronic diarrhea (12.9%, n=65), abdominal pain (10.9%, n=55), anemia (9.1%, n=46), constipation (7.3%, n=37), hematochezia and diarrhea (6.3%, n=32), altered bowel habits (5.1%, n=26), weight loss (3.6%, n=18), colonic thickening on CT scan (3.0%, n=15) and others (1.2%, n=6). Bowel preparation was adequate (in 92%, n=465) cases. Cecal intubation rate was 88.71% (n=448). Endoscopic diagnoses were hemorrhoids (36.2%, n=183), normal (22%, n=111), polyps (11.3%, n=57), ulcerative colitis (8.7%, n=44), cancer (4%, n=20), diverticulosis (3.4%, n=17), infective colitis (2.6%, n=13), intestinal TB (2.6%, n=13), non-specific colitis (2.2%, n=11), proctitis (1.8%, n=9) and others (5.3%, n=27).

Conclusion: There is room for improvement in quality of colonoscopy, cecal intubation rate is slightly below the recommended standard and polyp detection rate is quite low however, it is not clear if the low rate of polyp detection is due to missed lesions or low population incidence. Time to reach caecum and withdrawal time should clearly be documented in the notes which can help to evaluate quality of the procedure in a better way.

Key Words: Colonoscopy. Colon polyp. Colorectal cancer. Ulcerative colitis.

INTRODUCTION

Colonoscopy, introduced in the late 1960s, has become the principal method for diagnosis, treatment, and follow-up of colorectal diseases. Practice audit is essential for determining professional education.¹ Colonoscopy is preferred method to evaluate the colon in most adult patients with bowel symptoms, iron deficiency anemia, abnormal radiographic studies of colon, positive colorectal screening tests, post-polypectomy and postcancer resection surveillance, surveillance in inflammatory bowel disease and in those with suspected masses.

The use of colonoscopy has become accepted as the most effective method of screening the colon for neoplasia in patients over the age of 50 years and in younger patients at an increased risk.² Colorectal cancer (CRC) is a common malignancy especially in the Western countries and the third leading cause of cancer death.³

Colonoscopy is the gold standard for CRC screening and early detection of CRC has been shown to improve disease outcome.⁴ There is, therefore, the need to ensure proper conduct of this procedure, as it is highly operator dependent and standards vary greatly.⁵ The effectiveness of colonoscopy in reducing CRC incidence depends on adequate visualization of the entire colon, diligence in examining the mucosa. Preparation quality affects the ability to perform a complete examination, the duration of procedure and need to cancel or reschedule procedures.⁶ Longer withdrawal times have been shown to improve polyp detection rate; conversely, rapid withdrawal may miss lesions and reduce effectiveness of CRC prevention.^{7,8} The miss rates of colonoscopy for large (> 1 cm) adenomas may be higher than previously thought.^{9,10} Colonoscopy may be uncomfortable for the patient, usually entails intravenous sedation, and has perforation rates upto 0.5% and mortality about 0.1% and risks are thought to be higher in the elderly population.²

Quality indices to optimize endoscopy procedure include cecal intubation rate, adenoma detection rate, withdrawal time and quality of colonoscopy reporting. The later emphasizes, amongst others, the documentation of cecal landmark as well.¹¹ One clinical relevance of this is the occurrence of interval CRC, defined as CRC that

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occurs within a specified period of time after a colonoscopy (usually 5 years), a marker of poor quality colonoscopy.¹²

Several guidelines have been developed to enhance the quality of colonoscopy including the American Society for Gastrointestinal Endoscopy (ASGE) guideline¹³ and the position statement of the European Society for Gastrointestinal Endoscopy.¹⁴ The standard requirements for colonoscopy are to reach cecum in more than 90% of time and perform the procedure in a reasonable period of time, find and diagnose all lesions and complete procedure with minimal risk of complications and patient's discomfort.¹³ Important aspects of quality addressed by Rex *et al.*¹³ are appropriate indication, informed consent, use of recommended ulcerative colitis and Crohn's colitis surveillance, cecal intubation rates and photodocumentation of landmarks. Mean withdrawal time should be ≥ 6 minutes in colonoscopies with normal results performed in patients with intact colons. Biopsy specimens should be obtained from the colon in patients with chronic diarrhea.

In Pakistan, very little data is available on quality of colonoscopy. The aim of this study was to review the quality of practice of colonoscopy in Shifa International Hospital, Islamabad, Pakistan and document our pattern of colonic diseases including polyp detection rate.

METHODOLOGY

This was a retrospective study and complied with all ethical protocols as contained in the Helsinki declaration. All patients undergoing colonoscopy had informed written consent. Study was approved by Hospital Ethical Committee. A total of 505 colonoscopies were recorded which were performed between May 03, 2013 to June 28, 2014. The bowel preparation was done with low residue diet and polyethylene glycol. Twelve standard packs of polyethylene glycol mixed in 1 litre water and given 1 day before the procedure in 5 - 6 hours time. Patients were kept on liquid diet only 1 day before the procedure. Bowel preparation was graded as adequate or inadequate as reported by the performing colonoscopist. Adequate referred to clear fluid in the colon and inadequate to a solid or semisolid debris that could not be cleared effectively. Pre-medication mostly involved use of midazolam, fentanyl and ketamine. Only 22 patients out of 505 were put under Monitored Anesthesia Control (MAC).

The demographics, indications of the procedure and post-procedural diagnoses of the patients were recorded. Other parameters such as written informed consent, bowel preparation, rate of cecal intubation and complications after procedure were noted.

All data were analyzed using SPSS version 18. Categorical variables are presented as percentages and continuous variables as means.

RESULTS

Four endoscopists of the same department performed these procedures. Patients were aged between 05 and 91 years. Of 505 cases, 63.36% (n=320) were 50 years or under. The mean age was 44.86 ± 16.22 years. Three hundred and five (60.4%) of them were males, while 39.6% (n=200) were females.

Common indications for colonoscopy were lower gastrointestinal bleeding (26.5%, n=134), screening for colorectal cancer (14.1%, n=71), chronic diarrhea (12.9%, n=65), abdominal pain (10.9%, n=55), anemia (9.1%, n=46), constipation (7.3%, n=37), hematochezia and diarrhea (6.3%, n=32), altered bowel habits (5.1%, n=26), weight loss (3.6%, n=18), colonic thickening on CT scan (3.0%, n=15) and others 1.2% (n=6).

The quality of bowel preparation was adequate in (92%, n=465) and was inadequate in (8%, n=40) of patients.

The endoscopic diagnoses hemorrhoids (36.2%, n=183), normal (22%, n=111), polyps (11.3%, n=57), ulcerative colitis (8.7%, n=44), CRC (4%, n=20), diverticulosis (3.4%, n=17), infective colitis (2.6%, n=13), intestinal TB (2.6%, n=13), non-specific colitis (2.2%, n=11), proctitis (1.8%, n=9) and others (5.3%, n=27).

The polyp detection rate was 11.3% (n=57). Of these 57, (63.15%; n=36) were males and (36.84%, n=21) were females. Thirty eight (66.66%) of those having polyps were aged 50 years and above, while the remaining 33.33% (n=19) subjects were aged less than 50 years. Commonly locations of polyps were the sigmoid colon (33.33%, n=19), descending colon (22.80%, n=13) and rectum (19.29%, n=11). The cecal intubation rate was 88.71% (n=448).

No major complications were noted. However, 1.78% (n=9) patients suffered from hypotension during the procedure, which was corrected by intravenous fluids in all of them. Only 0.79% (n=4) patients experienced minor bleeding which was controlled on the spot.

DISCUSSION

Optimal bowel preparation is very important for adenoma detection.⁶ The present data showed that there were 88% patients with good bowel preparation. Bowel preparation relied on having the subjects on low residue diet as well as use of polyethylene glycol, which was tolerated very well. Sub-optimal bowel preparation in the patients may be because of non-compliance with medications or failure to understand the instructions. Thus, there is a room for improvement in this area. Adequate bowel preparation is considered to be the first factor in quality of colonoscopy.¹⁵

In this study, the cecal intubation rate of 88.71% which is slightly below the recommended ASGE average.¹³ Although reasons for incomplete examination were not

explored, this could be related to patient's tolerance and calmness during examination, which may be influenced by the type of bowel preparation and pre-medication. Brahmania *et al.* noted reasons for incomplete colonoscopy in a Vancouver Hospital to include poor bowel preparation, pain or inadequate sedation, structural anomaly including tortuous colon, diverticular disease, and obstructing mass lesion.¹⁶

In this study, the polyp detection rate was 11.3%, which is also much lower than that in Western literature.¹⁷ A study from Military Hospital, Rawalpindi reported colon polyps in 2.5% patients who presented with rectal bleeding.¹⁸ In a study of 158 colon polyps from Iran, 57% were neoplastic and 60% were in women.¹⁹ This variation may be due to population incidence or an underestimation due to missed lesions. An adequate withdrawal time is required for adenoma detection.^{7,8} Even with longer withdrawal times, being on call the night prior and performing a procedure lead to 24% decrease in the adenoma detection rates.⁵ Polyp prevalence has been reported to vary with age and gender, as this report shows a male predominance, and older age (> 50 years), while some reports have noted geographical differences in polyp detection though such differences were ascribed to environmental factors including diet rather than race.¹⁷

CRC frequency in this study was rather low. A study from Sindh, Pakistan reported 21% CRC were in young patients.²⁰ However, a study from Jordan reported median age of patients was 61.2 for males and 62.3 for females.²¹ A study from Karachi, Pakistan reported the most common findings were hemorrhoids in 22.8% patients presenting with fresh rectal bleeding.²² Ulcerative colitis is not an uncommon disease at the study center²³ and in this study nearly 8% were diagnosed this condition.

It was a single-center study and retrospective analysis relied on data submitted by the endoscopists, so one cannot rule out underreporting. The present sample size may appear small but this is a reflection of the level of practice of colonoscopy in our set up. Cecal intubation rate, which we calculated was a crude cecal intubation rate and reasons of incomplete examinations were not explored so as to get an adjusted cecal intubation rate, which is more accurate.

Moreover, as all biopsy samples were not chased up which was a major hindrance in calculating adenoma detection rate. Adenoma Detection Rate (ADR) is defined as the number of colonoscopies in which one or more adenomas detected, divided by the total number of colonoscopies. Whereas Polyp Detection Rate (PDR) is defined as the number of colonoscopies in which one or more polyps were removed and sent for histology, divided by the total number of colonoscopies performed. ADR is cumbersome to obtain because of the lack of

automated interfaces between pathology and endoscopy databases, which represents a challenge to many practices. In contrast, Polyp Detection Rate (PDR) is readily available from endoscopy reports and has been suggested as surrogate for ADR.^{24,25} Time to reach caecum and withdrawal time were not calculated as it was a retrospective study and there was paucity of such information in the reports.

Overall, the colonoscopy practice is yet to attain the standard as set in Western guidelines; similar findings or worse (cecal intubation rate between 56 and 76%) were recorded in UK over a decade ago but this improved with better training and infrastructure.²⁶ The authors believe that this study is going to serve as a stimulus for further research on quality of endoscopy that will help to improve endoscopic services.

CONCLUSION

The observed cecal intubation rate was just below that recommended by most guidelines. There was also a low rate of polyp detection and CRC, when compared to international standards.

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