
Original Research Article

Indications and Diagnostic Yield of Colonoscopy in a Tertiary Care Centre in South India

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Abstract

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Background: Accurate determination of indication is necessary to improve colonoscopic services. A detailed analysis and correlation of the colonoscopic indication with the histopathological diagnosis helps to increase the diagnostic yield of the procedure. The objective of this study was to determine the indications and estimate the diagnostic yield of colonoscopy in a tertiary care centre located in South India.

Materials and Methods: Three hundred and sixty patients who underwent colonoscopy were studied retrospectively. The histological diagnosis was correlated with the indication for colonoscopy and the diagnostic yield was calculated.

Results: The most common indications for colonoscopy in this study were bleeding per rectum, functional bowel disorders, chronic non-bloody diarrhoea and constipation. The overall diagnostic yield was 72.8% and 82.2% in those over the age of 50.

Conclusion: The diagnostic yield was high in our study especially in individuals more than 50 years of age. Colonoscopy remains an effective means of diagnosing colonic disorders.

Keywords: Colonic Polyps; Colonic Cancer; Colonoscopy.

Introduction

Colonoscopy is a safe and cost-effective procedure indicated for screening, diagnostic and therapeutic purposes. The specific indications include lower GI Bleed, evaluation of iron deficiency anemia, abdominal pain, constipation, chronic diarrhoea, radiological abnormalities of the terminal ileum and colon, diagnosis and follow-up of patients with known inflammatory bowel disease (IBD) and screening or surveillance for colon cancer.

The therapeutic indications for colonoscopy include bleeding, foreign body removal, dilation of strictures, palliative treatment of stenotic neoplasms and management of sigmoid volvulus and acute colonic pseudo-obstruction. Accurate determination of the indication for colonoscopy is necessary for optimizing clinical care, healthcare quality metrics, reducing costs, clinical research and also has implications for procedural urgency and scheduling [1]. Colonoscopy has a high yield for indications like blood in the stools and chronic

non-bloody diarrhoea. There is no clear consensus on the role of colonoscopy for functional bowel disorders [2]. The diagnostic yield of various indications of colonoscopy has been studied well in the Western world. There is a lack of Indian studies in this aspect. Moreover the pattern of colonic disorders is likely to be different in India in comparison to the West. Hence this study was undertaken to study the indications and diagnostic yield of colonoscopy in a tertiary care centre located in South India.

Materials and Methods

Colonoscopic biopsies taken anywhere between the terminal ileum to the level of pectinate line of anal canal between July 2009 and December 2014 were included in this retrospective cross-sectional descriptive study. Colonoscopic indications and clinical findings including follow up were noted from the Gastroenterology Departmental records and case files. The histological slides including special stains were reviewed retrospectively by two Pathologists and a histological diagnosis was assigned for each case. Two patients were excluded as the biopsies were inadequate for evaluation. The data of 360 patients was analysed after review

of all histopathology slides. Clinical parameters, colonoscopic findings and diagnosis were correlated with the histopathological diagnosis and the diagnostic yield was calculated. The diagnostic yield was expressed as the percentage of relevant colonic pathologies of the total number of colonoscopies performed [3].

The data was entered in Microsoft Excel (Microsoft Corp., USA) and analysed using IBM SPSS Statistics for Windows (version 20.0. Armonk, New York: IBM Corporation). Mean and SD were calculated for continuous variables like age. Categorical variables were expressed as frequencies and percentages. The study was approved by the institutional ethics committee (IEC: RC/13/65).

Results

The mean age group of the patients was 46.36 \pm 16.93 years with a range from 3 years to 86 years. Among the 360 cases, there were 238 males (66.11%) and 122 females (33.89%) with M: F ratio of 1.9:1. Colonoscopy was done for various indications as shown in Table 1 with bleeding per rectum (PR) being the commonest (28.9 %). Clinical indications were analysed in relation to histological diagnosis (Table 1).

Table 1. Clinical Indication vs Histological findings

Clinical Indication (number of cases)	Histological findings													Diagnostic Yield %
	Acute Colitis	Adenoma	Carcinoma	CD	Eosinophilic colitis	FAC	Inflammatory polyp	Normal Study	Other polyp*	SRUS	Tuberculosis	UC	Others**	
Anaemia (16)	2	1	5	0	0	2	0	4	0	1	0	0	1	75.0
Bleeding PR (104)	5	19	13	3	0	5	1	26	7	3	1	17	4	94.2 †
Constipation (48)	0	12	3	0	0	4	2	14	5	2	0	0	6	70.8
Recurrent fistula/fissure in ano (10)	1	0	0	2	0	1	0	4	1	0	0	0	1	60.0
FBD to rule out organic lesion (68)	2	9	2	3	0	5	3	34	2	1	5	0	2	50.0
IBD follow up (16)	0	0	0	2	0	0	0	2	0	0	0	12	0	87.5
Chronic Diarrhoea (66)	2	4	1	4	3	7	0	25	3	1	5	8	3	62.1
Miscellaneous indications \neq (13)	1	1	1	1	0	0	0	1	1	2	0	0	5	92.3
Surveillance (19)	0	5	1	0	0	1	1	8	3	0	0	0	0	57.9
Total (360)	13	51	26	15	3	25	7	118	22	10	11	37	22	72.8

\neq includes abnormal radiological findings, failure to thrive, pyrexia of unknown origin, etc.

* includes hyperplastic polyps, hamartomatous polyps, mesenchymal polyps

** includes lymphocytic colitis, diversion colitis, radiation induced colitis, ischemic colitis, etc.

† Diagnostic yield for bleeding PR includes histological abnormalities and lesions like telangiectasia and haemorrhoids which were detected at colonoscopy but could not be biopsied

Table 2. Colonoscopic findings and diagnosis

Colonoscopic diagnosis	No. of patients	Percentage %
Carcinoma (CA) colon	27	7.5
Diverticulosis	8	2.2
Colonic polyp	86	23.9
Intestinal tuberculosis	14	3.9
Crohn's disease (CD)	7	1.9
Non specific erosions/ ulceration	45	12.5
Normal Study	70	19.4
SRUS	9	2.5
Ulcerative colitis (UC)	33	9.2
Worm infestations	8	2.2
Telangiectasia	4	1.1
Miscellaneous (like rectal nodule, melanosis coli etc.,)	49	13.6
Total	360	100.00

Colonoscopic abnormalities were detected in 80.6% of patients as depicted in table 2. In addition to findings mentioned in Table 2, haemorrhoids were found in 143 (39.7%) patients.

Out of 360 patients, significant findings were found in 262 cases. Thus the overall diagnostic yield was 72.8%. When the diagnostic yield was stratified according to age of the patients, the overall diagnostic yield and the diagnostic yield for various indications was much higher in those over 50 years of age (Table 3).

Correlation between colonoscopic diagnosis and histological findings:

Colonoscopic examination appeared normal in 70 (19.4%) subjects, among whom histological

abnormalities were detected in nine cases: acute colitis in three, Crohn's disease (CD) in one, eosinophilic colitis in one, focal active colitis (FAC) in two and lymphocytic colitis in two cases. Colonoscopic features suggestive of intestinal tuberculosis were found in 14 cases. Among them eight were histologically confirmed as tuberculosis, while three were diagnosed as CD, one case as ulcerative colitis (UC), one case as FAC and one case as adenomatous polyp. Histological abnormalities were found in 30/45 patients in whom colonoscopy revealed non specific erosions or ulcerations .

Discussion

The indications for colonoscopy vary between studies. In our study, the most common indication for colonoscopic biopsies was bleeding PR, followed by functional bowel disorder to rule out organic lesion, chronic non bloody diarrhoea and constipation. A Spanish study revealed colorectal cancer screening and hematochezia / rectal bleeding to be the most common indications [4]. However a multicentre Spanish study revealed the most frequent indications of diagnostic colonoscopy to be rectal bleeding, followed by abdominal pain and evaluation of anaemia. Among follow-up colonoscopies, the most frequent indication in the Spanish multi-centre study was follow-up of adenomas and colorectal carcinoma [5]. It is important to remember that there is no national program for colorectal cancer (CRC) screening in India. Bleeding PR was the most common indication for colonoscopy in studies from Nigeria [6] and Pakistan [7]. Functional bowel disorder related symptoms was the most common indication for colonoscopy in two Asian studies [8,9].

Table 3: Diagnostic yield for various indications in ≤ 50 years and > 50 years

Clinical indication	Age ≤ 50 yrs		Age >50 yrs	
	N= 208	Diagnostic yield %	N= 152	Diagnostic yield %
Anaemia (16)	7/11	63.6	5/5	100.0
Bleeding PR (104)	48/51	94.1	50 /53	94.3
Constipation (48)	9/19	47.4	25/29	86.2
Recurrent fistula/ fissure in ano(10)	5/8	62.5	1/2	50.0
FBD (68)	16/45	35.6	18/23	78.3
IBD follow up (16)	9/10	90.0	5/6	83.3
Chronic Diarrhoea (66)	29/47	61.7	12/19	63.2
Miscellaneous indications (13)	8/8	100.0	4/5	80.0
Surveillance (19)	6/9	66.7	5/10	50.0
Total (360)	137/208	65.9	125/152	82.2

Colonoscopy was found to be normal in 19.4% of our patients and haemorrhoids were diagnosed in 39.7%. These figures are similar to the Spanish multicentre study, where 19.6% of colonoscopies were normal and haemorrhoids were detected in 30% of cases [5]. In our study 9/70 cases (13%) with normal colonoscopy showed pathological findings. A recent study from the UK, also showed pathological findings in only 10% of cases with normal colonoscopy [10]. Colonoscopic biopsies in endoscopically normal colonoscopies may reveal microscopic colitis, melanosis coli, infective etiologies or rarely inflammatory bowel disease (IBD).

Colonoscopic diagnosis of worm infestations was low in our study (2.2%) as compared to 11.4% of cases in another Asian study [9]. The difference may be attributed to socioeconomic profile of their patients as well as the fact that over the counter medications for worm infestations are readily available and taken in India.

The overall diagnostic yield in previous studies ranges from 25 to 51%. The yield also varies according to indication and with age [4,5,11,12]. Our overall diagnostic yield is 72.8%. Various factors like bowel preparation can influence the diagnostic yield [13]. Appropriateness criteria like the American Society for Gastrointestinal Endoscopy (ASGE), and European panel appropriateness of gastrointestinal endoscopy (EPAGE I and EPAGE II) do help in increasing the detection rate of significant lesions. However some relevant lesions are still missed even when the more sensitive EPAGE II criteria are used [14]. Criteria appropriate for Indian patients are yet to be established.

The diagnostic yield for hematochezia was high in our study. In our study, the major pathological finding in patients with bleeding PR was neoplastic lesions (adenomatous polyps and cancer) and IBD. About 25% of patients with bleeding PR had essentially normal findings on histology. About 77% of these patients with normal histology were found to have haemorrhoids and in addition, 15.4% of these patients were found to have causatory lesions which are not biopsied like colonic telangiectasia. Such lesions (telangiectasia and haemorrhoids) which could not be biopsied were also taken into account while calculating the diagnostic yield. The colonoscopic diagnosis of telangiectasia or haemorrhoids was considered as a diagnostic yield for bleeding PR cases with normal histology. Lasson et al also observed that cancers and adenomas >1 cm, IBD and angiodysplasia were leading causes of lower gastrointestinal

bleeding [15].

In our study, the second most common indication for colonoscopy was functional bowel disorder (FBD), which is a symptom-based condition in which affected individuals report recurrent bouts of abdominal pain or discomfort associated with altered bowel habits. The potential reason behind the evaluation of patients with suspected FBD was to rule out organic lesions like CRC or IBD, especially in patients with predominant diarrhoea. The overall diagnostic yield in clinically suspected FBD cases was 50% and about 78% in individuals over 50 years. Though more than 50% of cases do not reveal any significant pathology, colonoscopic biopsy helps to relieve the anxiety of patients and reassure clinicians. A case-control study from China, found organic colonic lesions in 30.3% of patients with suspected irritable bowel syndrome and compared with controls, patients with suspected irritable bowel syndrome had higher prevalence of noninflammatory bowel disease, noninfectious colitis and terminal ileitis but lower prevalence of diverticular disease, adenomatous polyps, and non-adenomatous polyps [16]. Of note EPAGE II criteria considers colonoscopy appropriate in patients of > 50 years with chronic or new-onset bowel disturbances, but not in patients with isolated chronic abdominal pain [2].

Colonoscopy is useful to establish a definitive diagnosis in cases of chronic diarrhoea of the 'large bowel' type. Colonoscopic biopsy revealed diagnoses like microscopic colitis, ulcerative colitis, Crohn's disease, active colitis, diverticulitis and colonic ischemia in 19% and colonic polyps in 29% of cases of chronic diarrhoea in a previous study [17]. In our study it is interesting to note that apart from colonic polyps and IBD, intestinal tuberculosis also presented as chronic diarrhoea. It is well known that it is important to biopsy the normal appearing colonic mucosa in cases of chronic diarrhoea. Biopsy of chronic diarrhoea cases (19/66) with normal appearing colonic mucosa revealed eosinophilic colitis (1 case) and acute colitis (1 case) in our study.

The diagnostic yield in those over 50 years of age was significantly higher for cases evaluated for constipation in our study. The most common significant finding was neoplasms (15/48), accounting for 31% of all cases (12 adenomatous polyps and 3 carcinomas). A previous study concluded that colonoscopy for patients with constipation as the sole indication had a lower yield of neoplastic lesions and no cancers were

detected [18]. However, a recent study from South Africa revealed findings in 40% of cases evaluated for constipation with significant pathologies like diverticular disease, neoplastic polyps and colorectal cancer [19].

The major limitation of our study was its retrospective design.

Conclusions

Colonoscopy is an effective diagnostic tool for colonic diseases and appropriate selection of cases can increase the diagnostic yield. The most common indications for colonoscopy in this study were bleeding per rectum, functional bowel disorders, chronic non-bloody diarrhoea and constipation. The diagnostic yield was high in our study particularly in individuals over 50 years of age.

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