

Original Research Article

Colonoscopy: an inquiry into indications, findings and their correlation at a tertiary care hospital

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ABSTRACT

Background: Though colonoscopy is widely performed, the statistical data regarding its indications, findings, and the diagnostic yield are not widely documented especially in developing countries. This study is an attempt to determine such data in a group of patients who underwent colonoscopy at our hospital.

Methods: This was a hospital-based retrospective study carried out at the Department of General Surgery, MMC&RI, Mysore. The subjects were a total of 286 patients who underwent colonoscopies in the year 2017. The relevant data from colonoscopy register were recorded and tabulated.

Results: The major indications in our study group were bleeding per rectum (25%), unexplained diarrhoea or dysentery (16%), pain abdomen (15%) and suspected malignancy (13%). Other indications included suspected inflammatory bowel disease (IBD), subacute intestinal obstruction, anaemia, mass per abdomen and suspected irritable bowel syndrome (IBS). More than one third (35%) had normal colonoscopic studies. The most common pathology found was malignancy (24%) followed by the spectrum of proctocolitis (20%). The indications which produced high diagnostic yields included suspected carcinoma (97%), bleeding per rectum (82%) and suspected IBD (80%). Significant number of patients with per rectal bleeding was diagnosed with malignancy (21%). The indications which produced low yields included subacute intestinal obstruction (31%), anaemia (45%), non-specific pain abdomen (50%) and suspected irritable bowel syndrome (18%).

Conclusions: Colonoscopy is highly rewarding among patients who are being evaluated for suspected malignancies, lower gastrointestinal bleeding and suspected IBD. As such, certain indications produce a higher diagnostic yield than others, suggesting that a stricter patient selection criterion may be employed for performing colonoscopy especially in resource poor settings.

Keywords: Colonoscopy, Bleeding per rectum, Carcinoma colon, Diagnostic yield

INTRODUCTION

Colonoscopy is an effective means of visualising the mucosa of the large intestine from the distal rectum to the caecum. It is carried out for several diagnostic reasons. It is performed to evaluate and confirm radiographic findings, to identify suspected polyps, to evaluate GI bleeding or anaemia, for colon cancer screening and surveillance, for follow-up after intervention for polyp or

cancer, for surveillance of inflammatory bowel disease, to evaluate unexplained altered bowel habits and weight loss and, for pre/intra-operative localization of lesions. Its therapeutic applications include control of bleeding, polypectomy, foreign body removal, reduction of sigmoid volvulus, decompression of acute megacolon, dilatation or stenting of strictures/stenosis (malignant and benign) and, as an adjunct to minimally invasive surgery for the treatment of diseases of the colon and rectum.

Many studies have documented the commonest indications with per rectal bleeding as the most common indication in several studies such as the one conducted by Hafner.¹⁻³ A considerable number of studies conducted in the west have documented varying degrees of diagnostic yield (diagnostic yield of an indication is defined as the ratio between significant findings detected on colonoscopy and the total number of procedures performed for that indication. A normal colonoscopy is not considered as significant in our study) for different indications.⁴⁻⁶ When studied by Hafner and Berkowitz et al, rectal bleeding, polyp follow-up and iron deficiency anaemia produced the highest diagnostic yields.^{1,2} They also documented lower yields for cancer follow-up, abdominal pain and abnormal bowel habits. The commonest colonoscopic finding varied across studies.³⁻⁵ In the study conducted by Olokoba et al the most common pathology was diverticulosis.³ The diagnostic yield of colonoscopy per se was found to be highly variable across studies.^{3,7-9}

Properly performed, colonoscopy is generally safe, accurate, and well tolerated. Hence it is one of the commonly used modalities in any general surgical department. Though the procedure is widely performed, the statistical data regarding its indications, findings and the diagnostic yield of all such indications are not widely documented especially in developing countries like India. This study is an attempt to determine the indications, findings, their correlation and also the diagnostic yield of each specific indication in a group of patients who underwent colonoscopy at our hospital.

METHODS

This was a hospital based retrospective study carried out at the Department of General Surgery, KR Hospital, Mysore Medical College and Research Institute, Mysore, Karnataka, India. The subjects were patients who underwent colonoscopies from in the year 2017. The endoscopy register was reviewed, and the biodata, indications and colonoscopic findings were recorded on a proforma. Data from a total of 286 patients was recorded and reviewed with respect to indications, findings, and their correlation.

Both inpatients and outpatients aged 16 years and above were included. Where multiple indications for a procedure existed, the dominant indication was adopted. Similarly when the patient was found to have more than one pathology, the dominant or malignant finding was given preference over a benign finding like haemorrhoids. The procedures which were not completed due to an uncooperative patient or poor colonic preparation or technical difficulties were excluded. Review and follow up colonoscopies in an already diagnosed group of patients were excluded. Screening colonoscopies were also excluded since they did not form a statistically significant group.

Bowel preparation was usually done with either 'Coloprep' or 'Peglec' commercial preparations. Biopsies were generally performed when the findings were suggestive of either inflammatory pathology or carcinoma. The diagnosis of polyp or carcinoma was always made by biopsy.

RESULTS

A total of 286 patients underwent colonoscopy. The most common indications are as depicted in Figure 1.

Bleeding per rectum (including melena, haematochezia and positive FOBT) is the most common indication for colonoscopy among the study group (25%). Almost equal number of patients makes up the next three common indications viz., unexplained diarrhoea or dysentery (16%), pain abdomen (15%) and suspected malignancy (13%) (Figure 1).

The most common findings are as depicted in Figure 2.

More than one third of the patients had normal colonoscopic studies (35%). The most common pathology found was malignancy (ca rectum/rectosigmoid-15%, ca colon-9%). The spectrum of colitis and proctocolitis was the next major finding (20%). Only five percent of the study group were found to have haemorrhoids as the only pathology (Figure 2).

Bleeding per rectum

The indication of bleeding per rectum (PR) included haematochezia, melena after exclusion of an upper gastrointestinal source and presence of faecal occult blood. The diagnostic yield of the colonoscopic studies performed for this indication was about 82%. Commonest findings for this indication are listed in Table 1. Carcinoma rectosigmoid (21%) was found to be the most common pathology in these patients. A considerable percentage of those who presented with bleeding PR had haemorrhoids (11%), ulcerative colitis (11%) and proctocolitis (8%). Almost fifth of the patients in this group were found to have normal colonoscopic studies (18%). Two patients of perianal fissure were included in the 'others' group.

Diarrhoea or dysentery

Unexplained diarrhoea/dysentery was the second most common indication in our study group and it produced a diagnostic yield of ~60%. Commonest findings for this indication are listed in Table 2. Majority of the patients with loose stools or dysentery were found to have normal colonoscopic studies (40%). The spectrum of colitis and proctocolitis was the most common pathology found in this group (35.5%). Around 11% of the cases who presented with diarrheal illness were found to have colorectal cancer.

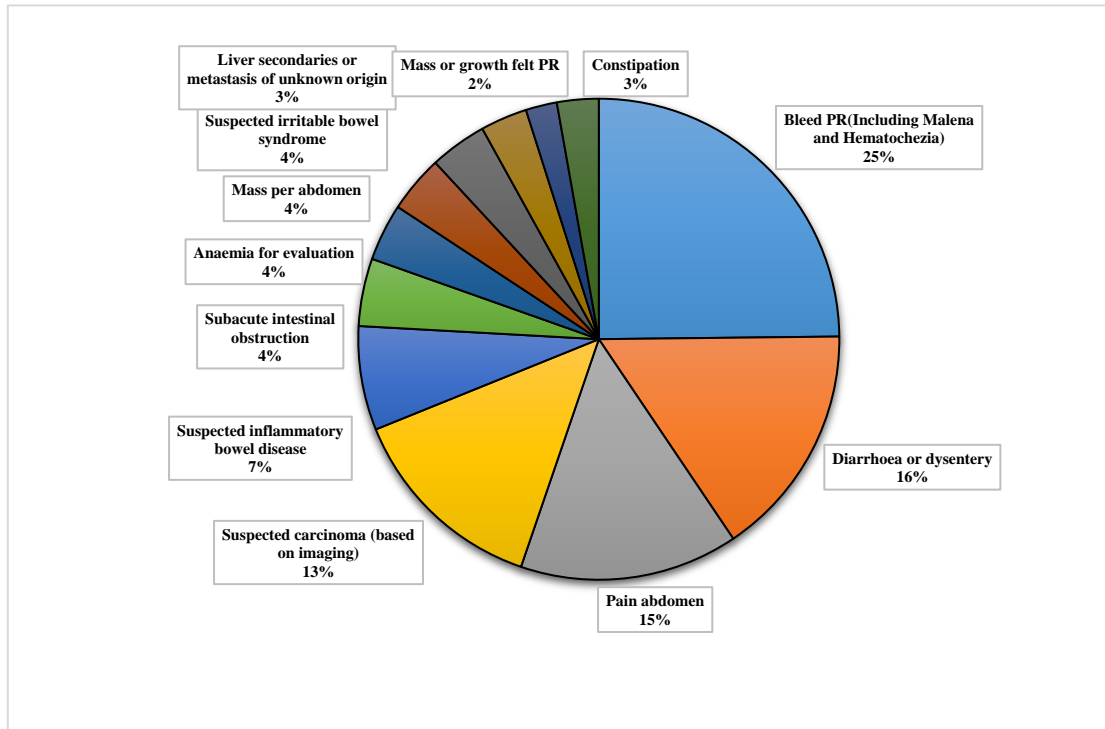


Figure 1: Most common indications.

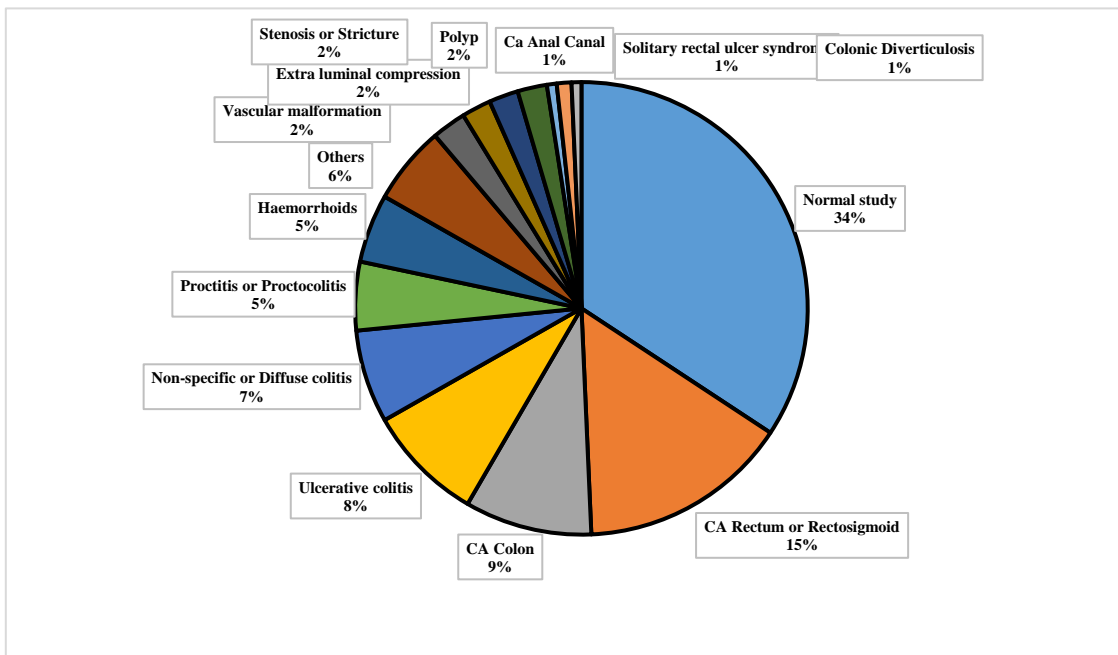


Figure 2: Most common findings.

Non-specific pain abdomen

Half the patients who underwent colonoscopy with pain abdomen as the primary indication were found to have normal colonoscopic studies signifying a modest diagnostic yield (50%). Commonest findings for this indication are listed in Table 3. Four patients (9.5%) in this group were found to have a pathology producing extraluminal compression. Three patients (7%) were

diagnosed with colon cancer. About 14% of patients had features of colitis or proctocolitis on colonoscopy. A case each of diverticulitis and coloenteric fistula was also found in this subgroup.

Suspected malignancy

This indication was associated with the highest correlation and diagnostic yield (97%) in our series. Out

of 39 patients who underwent colonoscopy for suspected carcinoma based on imaging studies, an overwhelming majority (92%) of them were found to have malignancies. This signifies that colonoscopy has a very high yield in detecting or confirming carcinomas in patients who have suspicious findings on imaging. The relevant data are as represented in Table 4.

Table 1: Common findings for the indication of bleeding per rectum.

Finding	No. of patients	~%
Carcinoma rectum or rectosigmoid	15	21
Normal study	13	18
Ulcerative colitis	8	11
Haemorrhoids	8	11
Proctitis or proctocolitis	6	9
Others	5	7
Vascular malformations	4	5
Carcinoma colon	3	4
Non-specific or diffuse colitis	3	4
Polyp	3	4
Stenosis or stricture	2	2
Solitary rectal ulcer syndrome	1	1

Table 2: Common findings for the indication of unexplained diarrhoea or dysentery.

Finding	No. of patients	~%
Normal study	18	40
Ulcerative colitis	8	18
Non-specific or diffuse colitis	6	13
Ca rectum or rectosigmoid	4	9
Proctitis or proctocolitis	2	4.5
Vascular malformations	2	4.5
Carcinoma colon	1	2
Hemorrhoids	1	2
Others	1	2
Polyp	1	2
Stenosis or stricture	1	2

Suspected IBD

Out of the 20 patients who underwent colonoscopy for the evaluation of suspected inflammatory bowel disease more than half of them were found to have colitis or proctitis or both signifying a high diagnostic yield (80%). The relevant data are as represented in Table 5.

Other indications

More or less the same number of people underwent colonoscopy for the following four indications in our study viz, anaemia, subacute intestinal obstruction, mass per abdomen and suspected irritable bowel syndrome.

Table 3: Common findings for the indication of non-specific pain abdomen.

Finding	No. of patients	~%
Normal study	21	50
Extra luminal compression	4	9.5
Others	4	9.5
Ca colon	3	7.1
Ulcerative colitis	2	4.8
Non-specific or diffuse colitis	2	4.8
Proctitis or proctocolitis	2	4.8
Polyp	1	2.4
Stenosis or stricture	1	2.4
Solitary rectal ulcer syndrome	1	2.4
Colonic diverticulosis	1	2.4

Table 4: Common findings for the indication of suspected malignancy.

Finding	No. of patients	~%
Ca rectum or rectosigmoid	21	53.9
Ca colon	13	33.3
Haemorrhoids	2	5.1
Ca anal canal	2	5.1
Normal study	1	2.6

Table 5: Common findings for the indication of suspected IBD.

Finding	No. of patients	~%
Ulcerative colitis	6	30
Non-specific or diffuse colitis	5	25
Normal study	4	20
Proctitis or proctocolitis	3	15
Ca colon	1	5
Others	1	5

Out of the 13 patients who underwent colonoscopy for evaluation of subacute intestinal obstruction, 9 had normal colonoscopic studies signifying a low yield (31%). Out of those with positive findings, two patients each were diagnosed with colorectal cancer and ileocecal tuberculosis.

Majority of the patients who underwent colonoscopy for the evaluation of anaemia had normal colonoscopic studies (54%) signifying a low diagnostic yield (46%). An interesting case of large bowel worm infestation was found in this study group.

Among the 11 patients who underwent colonoscopy for the evaluation of mass per abdomen, only three of them were found to have colon cancer (27%). Two patients were found to have colitis.

Table 6: Master chart.

Indications	Findings																
		Normal study	CA Rectum or Rectosigmoid	CA Colon	Ulcerative colitis	Non-specific or Diffuse colitis	Proctitis or Proctocolitis	Haemorrhoids	Others	Vascular malformation	Extra luminal compression	Polyp	Stenosis or Stricture	Ca Anal Canal	Solitary rectal ulcer syndrome	Colonic Diverticulosis	Total
Bleed PR (including malena and haematochezia)		13	15	3	8	3	6	8	5	4	0	3	2	0	1	0	71
Diarrhoea or dysentery		18	4	1	8	6	2	1	1	2	0	1	1	0	0	0	45
Pain abdomen		21	0	3	2	2	2	0	4	0	4	1	1	0	1	1	42
Suspected carcinoma (based on imaging)		1	21	13	0	0	0	2	0	0	0	0	0	2	0	0	39
Suspected inflammatory bowel disease		4	0	1	6	5	3	0	1	0	0	0	0	0	0	0	20
Subacute intestinal obstruction		9	1	1	0	0	0	0	2	0	0	0	0	0	0	0	13
Anaemia for evaluation		6	0	0	0	0	1	1	1	0	0	1	0	0	0	1	11
Mass per abdomen		5	0	3	0	2	0	0	0	0	1	0	0	0	0	0	11
Suspected irritable bowel syndrome		9	0	0	0	1	0	0	0	1	0	0	0	0	0	0	11
Liver secondaries or metastasis of unknown origin		6	0	0	0	0	0	1	1	0	1	0	0	0	0	0	9
Mass or growth felt PR		3	2	0	0	0	0	1	0	0	0	0	0	0	0	0	6
Constipation		3	0	1	0	0	0	0	1	0	0	0	2	0	1	0	8
Total		98	43	26	24	19	14	14	16	7	6	6	6	2	3	2	286

IBD: Inflammatory bowel disease; IBS: Irritable bowel syndrome; MUO: Metastasis of unknown origin.

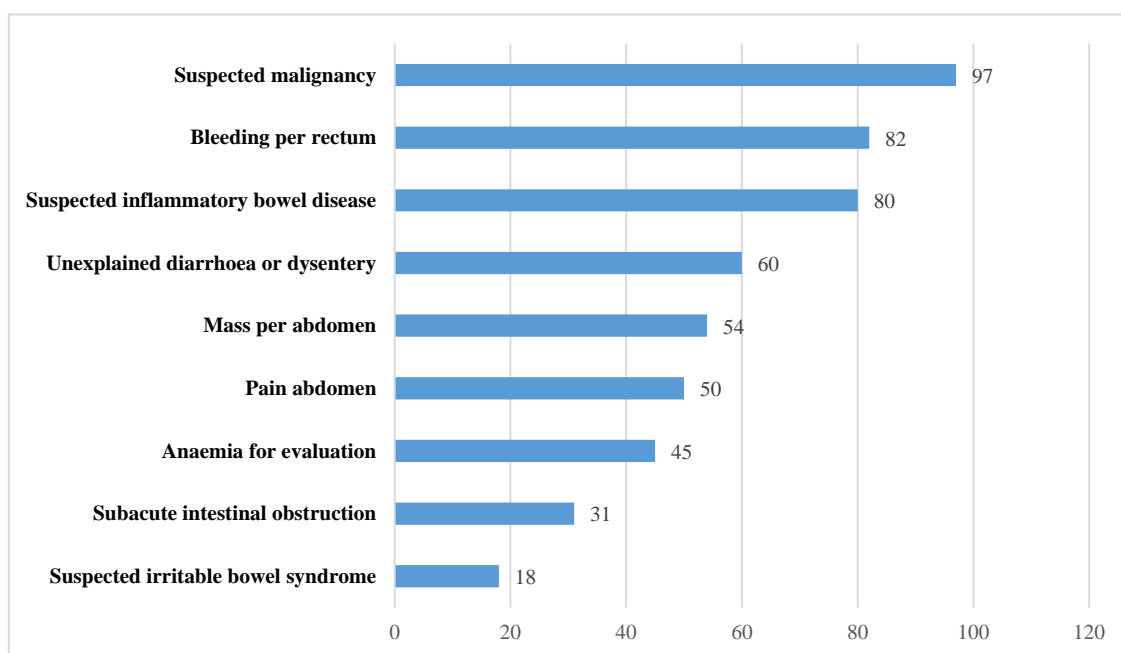


Figure 3: Diagnostic yield of all the main indications.

An overwhelming majority of the patients who underwent colonoscopy for the evaluation of suspected irritable bowel syndrome had normal colonoscopic studies (81%).

An interesting case of adult megacolon was diagnosed in a patient who underwent colonoscopy for the evaluation of chronic constipation.

Diagnostic yield

The diagnostic yields of all the main indications are as depicted in Figure 3. Patients who underwent colonoscopy for the indication of suspected carcinoma had the highest correlation (92%) and diagnostic yield. Other indications which produced high yields included bleeding PR (82%) and suspected IBD (80%). The indications which produced low yields included subacute intestinal obstruction (31%), anaemia (46%), non-specific pain abdomen (50%) and suspected irritable bowel syndrome (18%).

Findings

A total of 69 out of 286 patients were diagnosed with colorectal malignancies after colonoscopy. The most common indication to undergo colonoscopy in this subgroup was suspicious findings on imaging (52%). 26% of them had presented with bleeding per rectum. Few of them had also presented with altered bowel habits, pain abdomen, mass per abdomen, mass felt per rectum and subacute intestinal obstruction.

Out of the patients who were found to have colonic inflammation (colitis/proctitis/both) on colonoscopy,

excluding pain abdomen, most of them presented with bleeding per rectum or unexplained diarrhoea.

Patients who were found to have haemorrhoids, colonic polyps and vascular malformations on colonoscopy most commonly presented with bleeding per rectum. Some of the rare findings in our study group included coloenteric fistula, large bowel worm infestation, diverticulitis, adult megacolon and ileocaecal tuberculosis.

The master chart for the entire study is depicted in Table 6.

DISCUSSION

The major indications in our study group were bleeding per rectum (25%), unexplained diarrhoea or dysentery (16%), pain abdomen (15%), suspected carcinoma (13%) and suspected IBD (7%). Other indications included subacute intestinal obstruction, anaemia, and mass per abdomen and suspected IBS. Per rectal bleeding was also the most common indication in the studies conducted by Hafner, Berkowitz et al and Olokoba et al.¹⁻³ The other major indications in our study group are closely matched with the study conducted by Olokoba et al.³ In the study by Hafner which included more than thirteen thousand colonoscopies, the commonest indications were rectal bleeding, colon polyps, change in bowel habits, cancer follow-up and inflammatory bowel disease.¹

In our study, indications which produced high yields included suspected malignancy (97%), bleeding PR (82%) and suspected IBD (80%). When studied by Hafner and Berkowitz et al, rectal bleeding, polyp follow-up and iron deficiency anaemia produced the highest diagnostic yields.^{1,2} Other studies have also shown

similar results.^{4,6} The indications which produced low yields in our study group included subacute intestinal obstruction (31%), anaemia (46%), non-specific pain abdomen (50%) and suspected irritable bowel syndrome (18%). When studied by Hafner and Berkowitz et al, lower yields were obtained for cancer follow-up, abdominal pain and abnormal bowel habits.^{1,2}

The overall diagnostic yield in our study group was found to be 65%. A high yield was also obtained in Olokoba et al in their study.³ This contrasts with extremely poor yield of 21% as obtained by Al-Shamali et al, 48.0% obtained by Sahu et al, amongst their Indian patients and the 27.2% found by Siddique et al.⁷⁻⁹ The differences in the diagnostic yield may be due to varying sample sizes in the studies, the differences in the spectrum of colonic diseases seen in the different regions of the world, and the different selection criteria and indications for colonoscopy.

More than one third of the patients had normal colonoscopic studies (35%). The most common pathology found was malignancy (ca rectum or rectosigmoid – 15%, ca colon – 9%). The spectrum of colitis and proctocolitis was the next major finding (21%). In the study conducted by Olokoba et al only 20% of the patients had normal endoscopic findings.³ The most common pathology in that study was diverticulosis (16%) followed by polyps (15%), haemorrhoids (15%), anorectal cancer (13%), angiodysplasia (11%), colon cancer (8%) and colitis (7%).

Bleeding per rectum

With a high diagnostic yield of 82%, performing colonoscopy was a rewarding procedure in this group of patients. Significant number of patients with bleeding per rectum was diagnosed with malignancy (21%). Rex, in his study amongst Americans, demonstrated that colonoscopy for bleeding indications has a substantial yield for cancers.¹⁰ This suggests that any patient who is middle aged and above and presenting with per rectal bleeding should be evaluated thoroughly and malignancy must be excluded before arriving at any diagnosis. Being one of the commonest indication and with an excellent diagnostic yield, evaluation of rectal bleeding is a great opportunity for the medical community against the enemy of colorectal cancer.

Suspected malignancy

Patients who underwent colonoscopy for the indication of suspected malignancy had the highest correlation (92%) and diagnostic yield. This high diagnostic yield was matched by Al-Shamali et al.⁷ With such a high sensitivity colonoscopy is an irreplaceable tool in the diagnosis of colorectal malignancies. Apart from suspicious findings on imaging, symptoms which were most likely to be associated with cancer in our study include bleeding per rectum, altered bowel habits, pain

abdomen, mass per abdomen, mass felt per rectum and subacute intestinal obstruction in that order. In the study conducted by Leis et al.¹¹ symptoms most likely to be predictive of colorectal cancer or polyp at colonoscopy included bleeding (65%), faecal occult blood positive (64%), abdominal pain (60%), and alteration of bowel habits (53%).

Unexplained pain abdomen

The diagnostic yield is modest (50%) when colonoscopy is performed for this indication. It was associated with poor yield when studied by Al-Shamali et al.⁷ Among the patients with abdominal pain as a pathological symptom, diverticular disease predominated when studied by Berkowitz et al.² Diverticular disease is known to be an uncommon in developing world. This may partially explain its low incidence in our community.

Unexplained diarrhoea

Non-bloody diarrhoea is an uncommon indication for colonoscopy unless it is chronic and the stool cultures and ova/parasites have been non-diagnostic especially in developing countries where infective diarrhoea is still common. This indication was associated with poor to modest yield in several studies with IBD and microscopic colitis being most common colonoscopic finding.¹²⁻¹⁴ In our study, the spectrum of colitis and proctocolitis was the most common pathology found in this group (35.5%). Around 11% of the cases who presented with diarrheal illness were found to have colorectal cancer. Hence in patients with chronic diarrhoea, colonoscopy with biopsy is valuable for the diagnosis of IBD, other inflammatory disorders, and colorectal neoplasia.

Studies have shown that when esophagogastroduodenoscopy and colonoscopy are done for appropriate reasons significantly more clinically relevant diagnoses are made.¹⁵⁻¹⁷ Open access colonoscopy for patients with suspected colonic disease is often not practical and some form of patient selection may be necessary according to the pattern of disease in the community and the diagnostic yield of each specific indication.

CONCLUSION

Colonoscopy is an irreplaceable tool in the diagnosis of colorectal malignancies especially among patients who have suspicious findings on imaging. It is a highly rewarding procedure in those patients who are being evaluated for suspected malignancies, lower gastrointestinal bleeding and suspected inflammatory bowel disease. As such, certain indications for colonoscopy produce a higher diagnostic yield than others, suggesting that stricter patient selection criteria may be employed for performing colonoscopy especially in resource poor settings.

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