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Use of Colonoscopy in Identifying Malignant and Non-Malignant Anorectal Conditions Prior to Surgery

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ABSTRACT

Purpose of study: Colonoscopy is a commonly used diagnostic and therapeutic procedure for colon disorders. It is preferably performed on adults with lower GI symptoms such as abdominal pain, chronic diarrhoea, blood per rectum, constipation, prolapse from the rectum, changes in bowel habits, iron deficiency or anaemia. Colonoscopy is the gold standard diagnostic for inflammatory bowel disease (IBD) and Colon neoplasms; however, early diagnosis of these conditions is still limited. Hence, in this study, we study the role of colonoscopy screening in patients undergoing surgical treatment of anorectal conditions to identify missed lesions in routine perirectal and proctoscopy examination and confirm the findings of ultrasonography anorectal symptoms.

Methods: We have included colonoscopies of 96 patients who underwent various surgical procedures at R. D. Gardi Medical College and associated hospitals from December 2019 to April 2021. Data on age, gender, medical symptoms, comorbidities and family history were collected, and a colonoscopy was done prior to surgery.

Results: Colonoscopic examinations resulted in 80 abnormal findings, of which 12 were malignant. Twelve anorectal conditions that would have been missed otherwise were diagnosed among the 80 abnormal findings, including ulcerative colitis, haemorrhoids, tubercular colitis, fissure in ano and Carcinoma colon and carcinoma rectum. The most common symptoms that were significantly associated with abnormal findings were burning sensation or pain in the anal region, blood in stools, weight loss, diarrhoea and family history.

Conclusion: Colonoscopy is emerging as a community screening tool to identify malignancy in a very early stage. Our results emphasize the need to perform a simple out/ inpatient colonoscopy procedure before undertaking any anorectal surgery that may facilitate the early detection of colon malignancies.

Key words: Colon malignancies, Anorectal surgery, Colonoscopic examinations

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INTRODUCTION

Colonoscopy is a commonly used diagnostic and therapeutic procedure for colon disorders [1]. When performed correctly, it is generally a safe, precise, and well-tolerated procedure [2]. Colonoscopy is a mandated preoperative procedure to evaluate the colon in case of pathological conditions of anorectal and beyond. Colonoscopy is usually done for adults with large-bowel symptoms, iron deficiency, anaemia, abnormal radiographic results, positive results on colorectal cancer (CRC) screening tests, post-polypectomy and post-cancer resection surveillance, and diagnosis and surveillance in inflammatory bowel disease [1,3,4]. Reports suggest that regular screening by colonoscopy could prevent most deaths due to colon cancer by early detection and removal of cancerous and precancerous polyps. A nationwide study involving the observations of colonoscopies of patients with polyps suggested that periodic colonoscopy could prevent 76% to 90% of colon cancers [5]. Colonoscopy can be performed in two ways – actual and virtual. The virtual colonoscopy is performed for diagnostic purposes only when actual colonoscopy is not feasible due to age or associated comorbidities [6]. Diagnosis of anorectal diseases such as haemorrhoids,

anal warts, anal fissures or fistulas is performed using a proctoscope [7]. However, colonoscopy is the gold standard diagnostic for inflammatory bowel disease (IBD) and Colon carcinomas [8]. It is also important for anorectal conditions that are likely to be skipped in diagnosis beyond the reach of a proctoscope [9]. This is because visualizing the mucosa of the entire large intestine and distal terminal ileum is usually possible during colonoscopy. In some instances, preoperative cytological and histopathological confirmation helps the surgeon decide the type of surgical procedure to be performed [10]. Colonoscopy is also used to confirm such diagnoses by cytology, histopathology, and other imaging modalities like X-ray, ultrasonography, MRI, and CT scans. Further, polyps can even be removed during colonoscopy, thereby reducing the risk of colon cancer, wherein advanced techniques are used for improved efficacy [11]. Hence, colonoscopy is considered an emerging technique to diagnose and treat many medical and surgical diseases, both benign and malignant. In this background, this study aims to understand the importance of colonoscopy in all lower gastrointestinal pathology for medical or surgical treatment. The primary objective of this study is to identify lesions that are missed in routine per rectal and proctoscopy examination and to confirm the findings of ultrasonography and anorectal symptoms. We have included colonoscopies of 96 patients to diagnose various anorectal conditions that would have been missed otherwise.

METHODS

Study setting

This study was conducted in R. D. Gardi Medical College and associated hospitals from December 2019 to April 2021.

Study sample

The observations of adult patients scheduled to undergo various surgical procedures with any anaesthesia (general, local or regional) during regular hospital hours were included. Based on the prevalence of ulcerative colitis, 46% as reported, the sample size was calculated to be 96 with a 95% Confidence level.

Inclusion criteria

Patients aged from 16 to 78 years admitted to the hospital for various surgical procedures; presenting with symptoms such as bleeding per rectum, constipation, diarrhoea, haemorrhoids, Ano fistula, irritable bowel syndrome, abdominal pain and any other abnormal anorectal symptoms.

Exclusion criteria

Patients aged below 15 years or those allergic to local anaesthetic; with acute coronary artery disease, acute congestive heart failure or acute valvular heart disease; with a history of epilepsy and other CNS catastrophe like hemiplegia, paraplegia, Transient Ischemic Attack; those with coagulopathy, acute obstruction, acute fulminant colitis or acute anal fissure with extreme spasm of sphincter.

Data collection

All observations made on the study participants were entered in a predesigned proforma. The demographic data like age, sex, weight, height, and socioeconomic status were recorded. The patients included in the study were examined a day before the surgery to determine baseline values of vital parameters and to rule out any coexisting systemic disease. All the patients included in the study underwent routine preoperative biochemical investigations like the estimation of haemoglobin concentration, complete blood count, urine analysis, serum creatinine, random blood glucose, electrocardiogram, and Chest X-ray. They were instructed to remain nil by mouth after midnight, and bowel preparation with polyethene glycol with electrolytes (PEGWASH) was done 12 hours before the colonoscopy procedure. Colonoscopy under anaesthesia was performed, and the findings were noted under proforma.

Outcome

Diagnosis of different anorectal symptoms was made.

Statistical method

All statistical analysis was done using SPSS VERSION 23. A chi-square test was used to analyze any significant association between the measures and the outcome.

Ethical statement

This study was approved by the institutional ethics committee and research guidance committee. All participants were informed of the voluntary nature of their participation in the study. Informed consent was obtained from all participants included in the study.

RESULTS

The distribution of the study participants based on their basic demographic characteristics and presenting symptoms are presented in Table 1. The age of patients ranged from 16 to 78 years, with a median age of 45 years. Of the 96 adults included in the study, about 58% were males, and 42% were females. About 36% to 48% of the participants reported abdominal pain, diarrhoea, constipation, blood in stools and pain in the anus. Only 17.0037% reported weight loss, and 13% reported prolapse from the anus. About 15.6% had a history of alcohol addiction, and 32.3% had a history of tobacco addiction. Further, 11.5% of patients had a history of hypertension, 6.3% had a history of COPD, and 5.2% had a history of pulmonary tuberculosis. Among 96 observations, 80 abnormal colonoscopic findings, 12 malignant brush cytology findings and 38 findings that required surgical treatment were identified (Table 1).

Table 2 summarizes various abnormal colonoscopic findings. Colonoscopic findings revealed 80 abnormal findings with suspicious lesions in 12 adults.

Table 1: Descriptive statistics of the patients undergoing colonoscopy.

Parameters	N	N%
Age		
<30	20	21%
31-40	21	22%
41-50	22	23%
51-60	15	16%
>60	18	19%
Gender		
Male	56	58%
Female	40	42%
Abdominal Pain	44	46%
Weight Loss	17	18%
Diarrhea	38	40%
Constipation	35	36%
Prolapse from Anus	12	13%
Blood in Stools	44	46%
Pain in Anal Region	39	41%
Burning Sensation in Anal Region	46	48%
Other Associated Comorbidities		
Asthma	2	2%
CCF	1	1%
COPD	6	6%
DM	4	4%
HTN	11	11%
Hypothyroidism	3	3%
PTB	5	5%
None	64	67%
Associated Family History	27	28%
Alcohol Consumption	15	16%
Tobacco Use	31	32%
Colonoscopic Findings		
Normal	16	17%
Abnormal	80	83%
Brush Cytology Findings		
Malignant	12	13%
Non-Malignant	55	57%
Surgical Requirement	38	40%

Confirmatory tests by cytology and histopathology revealed malignant lesions in all suspected diagnoses. Among the 80 abnormal findings, ulcerative colitis was the most prevalent finding (18), followed by haemorrhoids (15), Tubercular colitis (11), fissure in ano (10) and Carcinoma colon (8). Other conditions were reported in 5 or fewer patients, including pancolitis, rectal polyps and ulcers, Crohn's disease, and rectal carcinoma. The highest proportion of tubercular colitis (20%) and ulcerative colitis 25%) were among adults aged below 30 years. The highest proportion of fissures in ano (27.3%) was among those aged 41-50 years, and hemorrhoids (26.7%) were among those aged 51-60 years.

CEA value was significantly high in all malignant cases. Among those diagnosed with tubercular colitis, all tested positive for the Mantoux test with significantly high ESR. CRP values were significantly high in cases of ulcerative colitis. Malignant cells were observed in biopsy sample in carcinoma colon and carcinoma rectum cases. Histopathology results suggested two types of carcinomas; adenocarcinoma and squamous

Table 2: Summary of the abnormal colonoscopy findings.

Diagnosis	N	N %
Normal	16	16.7
Adenomatous Rectal polyps	1	1
Adeno-villous rectal polyp	1	1
Carcinoma colon	8	8.3
Carcinoma rectum	4	4.2
Crohn's disease	2	2.1
Fissure in ano	10	10.4
Fistula in ano	1	1
Haemorrhoids	15	15.6
infective colitis	2	2.1
Pancolitis	5	5.2
Rectal polyps	1	1
Rectal ulcers	1	1
Tubercular colitis	11	11.5
Ulcerative colitis	18	18.8
Total	96	100

Table 3: Association of symptomatic measures with the outcome diagnosis.

Factors	N	Colonoscopic Findings (%)		P-Value
		Abnormal	Normal	
Age				
<30	20	75.00%	25.00%	0.415
31-40	21	81.00%	19.00%	
41-50	22	95.50%	4.50%	
51-60	15	86.70%	13.30%	
>60	18	77.80%	22.20%	
Gender				
Male	56	76.80%	23.20%	0.042
Female	40	92.50%	7.50%	
Abdominal Pain				
Yes	44	90.90%	9.10%	0.061.
No	52	76.90%	23%	
Weight Loss				
Yes	17	100.00%	0	0.042
No	79	79.70%	20.30%	
Diarrhoea				
Yes	38	94.70%	5.30%	0.015
No	58	75.90%	24.10%	
Constipation				
Yes	35	74.30%	25.70%	0.072
No	61	88.50%	11.50%	
Prolapse from Anus				
Yes	12	100.00%	0%	0.098
No	84	81.00%	19.00%	
Blood in Stools				
Yes	44	93.20%	6.80%	0.017
No	52	75.00%	25.00%	
Pain in Anal Region				
Yes	39	92.30%	7.70%	0.05
No	57	77.20%	22.80%	
Burning Sensation in Anal Region				
Yes	46	100.00%	0%	<0.0001
No	50	68.00%	32.00%	
Family History				
Yes	27	100.00%	0%	0.006
No	69	76.80%	23.20%	

cell carcinoma. Caseating granulomas and Langham's giant cells were seen in histopathology of patients with tubercular colitis. Crypt abscess and inflammation in mucosa and sub mucosa were seen in the histopathology of ulcerative colitis.

The association between age, gender, presenting symptoms and family history with the colonoscopy findings is presented in Table 3. It was found that gender (male) and symptoms such as Burning Sensation or pain in Anal Region, Blood in stools, weight loss, Diarrhoea and family history were significantly associated with abnormal colonoscopy findings. Other factors such as age or associated comorbidities were not significantly associated with abnormal findings. Behaviours such as tobacco and alcohol abuse were not significantly associated with abnormal findings. Further, age or gender was not significantly associated with malignancy ($p>0.05$). However, the older age of 41 – 50 years was significantly associated with fissure in ano ($p=0.04$), and the female gender was significantly associated with ulcerative colitis ($p=0.004$).

DISCUSSION

Ever since the introduction of colonoscopy in 1963, the technique has gradually evolved and is now used for diagnostic and therapeutic purposes [1]. Proctoscopy is generally used to examine anorectal conditions such as haemorrhoids or fissures. On the other hand, colonoscopy can be used to examine the entire colon. Incidentally, prior to haemorrhoids or fissures surgery, cases of ulcerative colitis or Crohn's disease can be identified, in which case surgery is reserved for selected indications. Hence, this study aimed to identify lesions that could have been otherwise missed in routine per rectal and proctoscopy examination. We performed colonoscopy on 96 adult patients scheduled to undergo various surgical procedures at R. D. Gardi Medical College and associated hospitals. A brief analysis of the colonoscopic observations resulted in the diagnosis of 12 lower gastrointestinal tract diseases that could have been missed.

Colonoscopic examinations resulted in 80 abnormal findings, of which 12 were malignant. Among the 80 abnormal findings, ulcerative colitis was the most prevalent finding (18), followed by haemorrhoids (15), Tubercular colitis (11), fissure in ano (10) and Carcinoma colon (8). The most common symptoms that were significantly associated with abnormal findings were burning sensation or pain in the anal region, blood in stools, weight loss, diarrhoea and family history.

Previous studies on preoperative colonoscopy indicate the importance of colonoscopic observations in identifying the localization of the lesions that may have a significant impact on intraoperative plan which changes patient outcomes [12-14]. Colonoscopy combined with biopsy was found to be effective in confirming specific disease diagnosis, specific histological diagnosis and microscopic colitis [10,15]. Colorectal carcinomas or colonic neoplasms were also reported to be diagnosed by colonoscopy in patients with lower gastrointestinal symptoms. Previous studies also report that some of the most common lower GI symptoms resulting from major abnormal findings through colonoscopy were chronic diarrhoea, abdominal pain, change in bowel habits [16], and rectal bleeding [16,17]. anaemia or iron deficiency was also reported to be associated with lower GI conditions [17]. In general, it is suggested that performing colonoscopy for lower GI symptoms will be helpful in diagnosing various conditions of the lower GI and preoperative decisions. More recently, colonoscopy has advanced with various imaging techniques such as narrowband imaging, Confocal laser endo-microscopies, endoscopic submucosal resection, and endocystoscopy [18,19]. Such advanced colonic imaging is a great source of information for gastrointestinal physicians and clinicians. However, there is a considerable gap in the early diagnosis of the number of colonic cancers, whereby colonoscopy could be a potential technique to identify such lesions when anorectal proctoscopy is recommended. So, we recommend a colonoscopy screening protocol for all anorectal or colonic conditions prior to surgery. Colonoscopy is emerging as a community screening tool to identify malignancy in a very early stage. Further Artificial intelligence (AI) with clinical applications in colonoscopy is emerging, significantly impacting diagnostic and therapeutic procedures for gastrointestinal pathologies [20]. AI is also gaining importance with applications to localize and map the tumours by magnifying the endoscopy before dissection to modify planned surgery if needed and detect hidden pathologies in colonic mucosal folds [3,21]. This will avoid post-operative dilemmas and unforeseen situations arising from other comorbidities.

To summarize, anorectal lesions or pathologies are commonly prevalent in surgical OPD. Most common lower GI symptoms include perianal burning sensation, blood in stool, feeling of incomplete evacuation, perianal itching, pain in the abdomen, and pain in the anal region. Colonoscopy is highly helpful in diagnosing various pathologies beyond the reach of per rectal and proctoscopy examination. When used as a community screening tool, colonoscopy can aid the early diagnosis of colon malignancies. While colonoscopy is preferred for lower GI symptoms, it is often not performed regularly. Preoperative colonoscopic screening is mandated for surgical treatment of bleeding per rectum. Hence colonoscopy should be regularly performed as a screening procedure to prevent evading the lesions that are less likely to be noticeable by other screening modalities. Moreover, colonoscopy is the only procedure for biopsy suspected lesions and confirming the diagnosis by cytology and histopathology. We recommend a simple out/ inpatient colonoscopy procedure before undertaking any anorectal surgery.

CONCLUSION

Colonoscopy is emerging as a community screening tool

to identify malignancy in a very early stage. Our results emphasize the need to perform a simple out/ inpatient colonoscopy procedure before undertaking any anorectal surgery that may facilitate the early detection of colon malignancies.

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