Colonoscopy and Colorectal Cancer- A Single Hospital Experience, Aden, Yemen

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Abstract

Introduction: Colonoscopy is an effective tool for the investigation of colorectal disorders, a common health problem in humans. The study aimed to analyze some demographic features, presenting symptoms and colonoscopic findings and colonoscopic interventions carried out in 22 May Hospital, during 2018 and 2019 with special interest on patients' variables and presenting symptoms regarding colorectal cancer.

Methods: This is a retrospective study of two-year duration, in 22 May Hospital, Aden. Available electronic reports of colonoscopies, during the study period (and corresponding histopathology reports if present) were reviewed. Relevant data were extracted. Descriptive and analytic statistics were performed. To find out association between variables regarding colorectal cancer, Fisher's exact test were used. The p-value of < 0.05 was considered statistically significant.

Results: A total of 284 colonoscopy reports were included in the study for 191 males (67.3%) and 93 females (32.7%). The age ranged from 2 to 90 years with a mean age of 44.8 with a standard deviation (SD) $\pm$ 18.04 years. Bleeding per rectum and abdominal pain were the most frequent indications for colonoscopy; 47.2% and 14.4% respectively. Hemorrhoids were the most common colonoscopic finding (43.3%), followed by normal colonoscopic findings in 15.8% of cases. Non-specific colitis was the most common histopathologic result (33.3%) followed by cancer (31.9%) of biopsy samples. Cancer detection during colonoscopy has statistically significant association with the presenting complains of constipation and change in bowel habit (p=0.003 and <0.001 respectively).

Conclusion: Detection of colorectal cancer is an important aim of most colonoscopic examinations. Symptoms of constipation as well as change in bowel habit should be handled cautiously and may deserve colonoscopic examination.

Keywords: Endoscopy, Adenocarcinoma, Colitis, Polypectomy, Bleeding per rectum.

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تنظير القولون وسرطان القولون والمستقيم- خبرة أحد المستشفيات في عدن، اليمن

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ملخص الدراسة

المقدمة: تنظير القولون من الأدوات الفعالة في تشخيص اعتلال القولون والمستقيم، وهي مشكلة صحية شائعة لدى الانسان. هدفت الدراسة إلى تحليل بعض الخصائص السكانية (الديموغرافية)، دواعي تنظير القولون، نتائج التنظير وتدخلات تنظير القولون والتي أجريت في مستشفى 22 مايو، عامي 2018 و2019، مع اهتمام خاص بمتغيرات المرضى والأعراض السريرية لسرطان القولون والمستقيم.

المنهجية: هذه دراسة استيعادية مدتها عامين في مستشفى 22 مايو، عدن. تمت مراجعة التقارير الالكترونية المتاحة لتنظير القولون (وتقارير الأنسجة ذات الصلة إن وجدت) كما تم استخلاص المعلومات وثيقة الصلة بموضوع الدراسة وتحليلها إحصائيا باستخدام التحليل الوصفي. لإيجاد علاقة بين المتغيرات بخصوص سرطان القولون والمستقيم، تم إجراء اختبار فيشر مع اعتبار قيمة p اقل من 0.05 ذات دلالة إحصائية.

النتائج: تضمنت الدراسة 284 تقرير لتنظير القولون منهم 191 لذكور (67.3%) و93 لإناث (32.7%) تراوحت أعمارهم من 2 الى 90 عاماً وكان متوسط العمر44.8 مع انحراف معياري ± 18.04عاماً. كان النزيف عبر المستقيم وآلام البطن أكثر دواعي إجراء تنظير القولون (47.2% و14.4% على التوالي) بينما البواسير أكثر نتائج التنظير (43.3%) يليه في الترتيب النتائج الطبيعية لتنظير القولون (15.8%). التهاب الأمعاء غير النوعي كان أكثر نتائج فحص الأنسجة في (33.3%) يليه السرطان (31.9%) من إجمالي فحوصات الأنسجة. وقد وجدت علاقة ذات دلالة إحصائية بين اكتشاف السرطان بتنظير القولون وكل من الشكوى بالإمساك وتغير في عادة التبرز 0.03=p و0.001 < على التوالي).

الاستنتاج: اكتشاف سرطان القولون والمستقيم من الأهداف المهمة لتنظير القولون لذا يجب التعامل الحذر مع أعراض الإمساك وكذلك تغير عادات التبرز إذ قد تتطلب إجراء تنظير القولون.

الكلمات المفتاحية: التنظير، سرطانة غدية، التهاب القولون، استئصال السليلة، نزيف عبر المستقيم.

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Introduction

Colonoscopy or coloscopy is the endoscopic examination of the large bowel and distal part of the small bowel with a fibrooptic camera on a flexible tube passed through the anus [1]. It has become the first line of investigation for screening, diagnosis, surveillance and treatment of numerous colonic conditions. Colonoscopy may be performed to look for a source of abdominal pain, bleeding or diarrhea or to evaluate an abnormality that has been identified by one of the x-ray examinations. It is a gold standard to screen for colorectal cancer (CRC) and has shown to improve the disease outcome [2,3].

CRC is a common cancer worldwide. It ranks third in terms of incidence but second in terms of mortality. CRC incidence rates are about 3-fold higher in transitioned versus transitioning countries. However, with average case fatality higher in lower HDI (Human Development Index) settings, there is less variation in the mortality rates [4].

Evidently, colonoscopy is the most accurate method for detecting polyps. It has been quickly replaced fecal occult blood testing, flexible sigmoidoscopy, and barium enema as a primary screening modality, although those remain an approved method to screen for CRC in the asymptomatic patients [5].

Polypectomy has become a routine part of colonoscopy allowing for quick and simple removal of polyps without invasive surgery. It can interrupt the progression of precancerous polyps to cancer [6].

Furthermore, colonoscopy allows complete visualization of the lining of large intestine. However, the effectiveness of colonoscopy hinges on adequate bowel preparation. The preparation is often the least tolerated part of the examination [7]. As CRC screening and surveillance increase worldwide, the number of endoscopies is also steadily increasing [8].

Colonoscopy is an invasive test with known risk, but are performed safely with only rare serious complications. Although the rate of adverse events is low, it should not be underestimated. In particular, perforations are associated with high rates of morbidity and mortality. They can also cause serious conditions in healthy people. Another concern is the occurrence of a chain effect caused by the complication. An adverse event not only affects the patient the moment it occurs, but also afterwards [8]. Therefore, colonoscopy is not a perfect tool and several aspects of this procedure continue to be a focus of active research to improve quality as well as patients' outcomes [9].

The present study aimed to analyze some demographic features, presenting symptoms and colonoscopic findings (histopathology results if present) and colonoscopic interventions carried out in 22 May Hospital, during 2018 and 2019. With special interest on analyzing patients' variables and presenting symptoms in regard to CRC.

Methods

Study design and setting

This is a hospital based retrospective study of 2-year period from 1st January 2018 to 31st December 2019 in the 22 May Hospital- Aden. Source of information were the available electronic reports of colonoscopies as well as their histopathological reports during the study period (if present).

Data processing and analysis

Damaged files were excluded from the study. For each patient; gender, age, indications for colonoscopy, colonoscopic morphologic findings, site, histology (if biopsy was taken) and colonoscopic interventions (if endoscopic intervention were carried out) were recorded. Mean and standard deviation (SD) were calculated for continuous variables such. Frequencies and percentages were calculated for categorical variables. Relationship between various parameters such as indication for colonoscopy and selected colonoscopic finding (CRC) were assessed using Fischer's exact test. The *p*-value of <0.05 was considered statistically significant. The Statistical Package for Social Sciences (SPSS 17) was used for data processing and analysis.

Instrumentation

Colonoscopy was performed using Olympus Exera II CV-180 device. Patient came to the colonoscopy suit after bowel preparation. Written consent was taken for each patient or from their parents (if child). All procedures were done under IV sedation by anesthesiologist with close monitoring of vital signs and oxygen saturation.

Results

A total of 284 colonoscopic reports were analyzed for 191 males (67.3%) and 93 females (32.7%). The age ranged from 2 to 90 years, and the mean age was 44.8 ± SD 18.04 years.

Table1: Socio- Demographic Characteristics of the Study Population (n=284), 22 May Hospital, Aden, 2018-2019

Characteristic	No.	%
Gender		
Male	191	67.3
Female	93	32.7
Age (years)		
<10	9	3.2
10-19	17	6.0
20-29	31	10.9
30-39	48	16.9
40-49	43	15.1
50-59	65	22.9
60-69	48	13.7
≥ 70	26	9.2
Mean age ± SD	44.8 ± 18.04	
Range	2- 90	

Bleeding per rectum was the most common indication for colonoscopy as almost half of the patients (47.18%) were registered with this complain, followed by abdominal pain (14.43%). Their detail is further illustrated in Table 2.

Table 2: Indications for Colonoscopy, 22 May Hospital, Aden, 2018-2019

Indications	Male	Female	Total	%
Bleeding per rectum	85	49	134	47.2
Abdominal pain	32	9	41	14.4
Chronic constipation	17	10	27	9.5
Chronic diarrhea	14	5	19	6.7
Anemia	9	8	17	6.0
Anal pain	6	2	8	2.8
Melena	6	1	7	2.5
Bloody stool	4	1	5	1.8
Change bowel habit	2	4	6	2.1
Foreign body	1	0	1	0.4
Other	15	4	19	6.7
Total	191	93	284	100

Table 3 indicates that hemorrhoid was the most common colonoscopic finding (43.3%). The results of colonoscopy were normal in 15.8%. The colonoscopic polyp detection rate was 13% and ranked as third most common finding. In 7 cases (2.5%), the colonoscopy was not completed due to poor bowel preparation, and consequently diagnosis could not be made. In 4 cases, colonoscope could not pass beyond a fixed narrowing of the colonic lumen. However, diagnosis was facilitated by endoscopic biopsies, which revealed carcinoma on histology in 3 out of 4 cases, and severe non-specific colitis in the remaining one. Successful caecal intubation were reached in 273 cases (96.1%). There was no reported incident of perforation or mortality.

Table 3: Results of Colonoscopy, in 22 May Hospital, Aden, 2018-2019

Colonoscopic finding(s)[1]	Male	Female	Total[2]	%[3]
Hemorrhoids	83	40	123	43.3
Normal	32	13	45	15.8
Polyp	27	10	37	13.0
Colitis	26	8	34	12.0
Mass	16	12	28	9.9
Proctitis	10	9	19	6.7
Anal fissure	8	5	13	4.6
Diverticula	7	4	11	3.9
Ulcer	4	4	8	2.8
Poor bowel preparation	5	2	7	2.5
Terminal illeitis	5	1	6	2.1
Parasite	0	2	2	0.7
Foreign body	1	0	1	0.4
Others	4	0	4	1.4
Colonoscopic findings[1] count	**Male**	**Female**	**Total[2]**	**%[3]**
1 finding	154	76	230	81.0
2 finding	37	17	54	19.0
Total	191	93	284	100

[1] Colonoscopic finding(s): not restricted to single finding per case. [2]Total= male + female in same row (total of category). [3] Percent (%) calculated from total number of colonoscopies (grand total, n=284).

As shown in Table 4, biopsies were taken in 72 cases (25.4% of 284) during colonoscopy, fixed by formalin and sent for histopathologic examination. Non-specific colitis was the most common result (24 cases, 33.3% of biopsy samples), followed by cancer (23 cases 31.9%).

Table 4: Histopathology Results of Biopsy Specimen Taken During Colonoscopy, in 22 May Hospital, Aden, 2018, 2019

Histopathology result	No.	%	No.	%
Procto-colitis	43	59.7		
Non- specific colitis			24	33.3
Non- specific proctitis			4	5.6
Non- specific ileitis			3	4.2
Crohn disease			6	8.3
Ulcerative colitis			4	5.6
Bilharzial colitis			1	1.4
Pseudomembranous colitis			1	1.4
Cancer	23	31.9		
Adenocarcinoma			21	29.2
Squamous cell ca.			1	1.4
Carcinoid			1	1.4
Polyp	4	5.6		
Adenomatous polyp			2	2.8
Juvenile retention polyp			1	1.4
Inflammatory polyp			1	1.4
Ulcer	2	2.8		
Solitary rectal ulcer			2	2.8
Total	72	100	72	100

Percent calculated from total number of histopathology, n=72.

Sigmoid colon and rectum were common sites for cancer detection and about 16% of CRC cases were younger than 38 years. Their details are illustrated in Table 5.

Table 5: Cancer Location During Colonoscopy in Relation to Gender and Age, 22 May Hospital, Aden, 2018, 2019

Cancer location	Male		Female		Total		Mean age	Std	Min	Max
	No.	%	No.	%	No.	%				
Caecum+ ascending colon	2	20	2	15.4	4	17.4	57.8	9.17	58	70
Sigmoid	2	20	4	30.8	6	26.1	58.3	11.70	45	70
Rectum+ anus	6	60	7	53.8	13	56.5	48.3	16.26	14	74
Total	10	100	13	100	23	100	52.5	14.54	14	74

It was found that cancer detection during colonoscopy has statistically significant association with the presenting complains of constipation or change in bowel habit with *p*=0.003 and <0.001 respectively, Table 6.

Colonoscopic polypectomy was done in 16 cases (5.6%). Foreign body (glass piece) was removed in 1 case (0.35%) from the caecum by basket.

Table 6: Relation between Indications for Colonoscopy and Cancer Detection

Indication	Cancer detected		Cancer not detected		p
	No.	%	No.	%	
Bleeding per rectum	7	5.2	127	94.8	0.127
Abdominal pain	1	2.4	40	97.6	0.219
Constipation	7	25.9	20	74.1	0.003
Change in bowel habit	5	83.3	1	16.7	<0.001
Anemia	3	17.6	14	82.4	0.149
Other indications= 59					

Percent was calculated from row total
Total cancer cases = 23
Total indications = 284

Discussion

In the current study, about two thirds of patients were males (67.3%), with a male to a female ratio of 2:1. This is almost identical to a study by Shrestha *et al*, in Nepal, where 67.6% were males, and likewise, male to female ratio was 2:1 [10]. Male dominance was reported in other colonoscopic studies including those from Karnatka, India by Dinesh *et al* [6]; Ile-lfe, Nigeria by Alatise *et al* [11]; and Pakistan by Channa *et al* [12]. In contrast, a study in central Jamaica by Plummer *et al* shows that 56% of colonoscopy patients were females [13]. On the other hand, Harewood *et al* in USA, studied colonoscopy practice patterns since introduction of Medicare coverage for average-risk screening, and reported almost equal number of males and females [14].

All age groups are present in this study, starting from 2 years to 90 years with a mean age of 44.8± 18.04. This finding is almost similar to that reported by Dinesh *et al* (43.0±15) [6] and Shrestha *et al* (46.98±17.13) [12]. However, Plummer *et al* [13] and Harewood and Lieberman [14] showed higher mean age (60.6 and 62.4 respectively).

Bleeding per rectum was the primary indication for colonoscopy (47.2%). Among them; 7 patients (5.2%) had colonic cancer. In Pakistan by Salamat *et al*, bleeding per rectum was the most frequent indication (38.8%), followed by chronic diarrhea (25.6%) [2]. Consistently, rectal bleeding was the most frequent colonoscopy indication (24.8%) in Karnatka, India by Dinesh *et al* [6].

In this study, abdominal pain was the second most common colonoscopy indication and revealed carcinoma in 2.4% of cases. Shamali *et al* in Kuwait, found abdominal pain as the primary indication for colonoscopy and carcinoma detected in 0.3% of these patients [15]. On the other hand, the current study shows that complete examination of the caecum or terminal ileum was achieved in around 96% of patients. This is consistent with studies

conducted by Shamali *et al* in Kuwait [15], and Plummer *et al* in central Jamaica [13] with successful caecal intubation of 95% and 96% respectively. However, Ennaifer *et al* in a Tunisian endoscopy unit, reported a caecal intubation rate of only 61.1% noting that colonoscopies were performed without sedation in the Tunisian institute [16]. Successful caecal intubation rate as well as colonic polyp detection rate are important quality indicators for colonoscopy (key performance indicators), which are readily measurable and associated with improved patient outcomes [16,17].

In this study, 15% of the study population had normal colonoscopic findings. This rate was comparatively lower than that reported by Shrestha in Nepal [10] and Alatiese *et al* in Nigeria [11] (29% and 19.3% normal colonoscopic studies respectively). However, Onyekwere *et al* in Lagos had 9.1% normal findings [18]. Studies have shown that when colonoscopy are done for appropriate reasons, significantly more clinically relevant diagnosis are made [17].

Regarding colonoscopic findings, haemorrhoid was the most common finding, (43.3%). Similarly, haemorrhoid were the most common colonoscopic finding in the studies by Onyekwere *et al* in Lagos [18] and Channa *et al* in Pakistan [12] (43.2% and 32.48% respectively).

In this series, colorectal polyps were detected in about 13% of patients, and ranks for the third common finding (second abnormal finding) with large proportion of these

polyps found in children. Kayamba *et al* in their series found 8% polyp detection with significantly high detection among patients under 16 years old compared to adults [19]. However, Kidwai and Sharma in Nepal found 15.5% prevalence of polyps (third common finding), and polyps were commonly detected in children [20].

Diverticular disease was found in 3.78% of patients. This is slightly higher than what was reported by Salamat *et al* in Pakistan (diverticulosis 2.3%) [2]. In a study by Azzam *et al* in KSA, found a slightly higher prevalence of colonic diverticulosis (7.4%) compared to these studies [21]. Katsidzira *et al*, in Zimbabwe found diverticulosis among 21% of symptomatic colonoscopy patients. They noticed statistically significant difference ($p<0.001$) in the diverticulosis incidence among ethnic groups, being lower in Black Africans, higher in Asians and the highest in Caucasians [22] whereas Plummer *et al* in central Jamaica found diverticulosis in 32% of the colonoscopic patients and was the most common identified colonoscopic finding [13].

Regarding colonic cancer, female preponderance was noticed, with a male to female ratio of 1:1.3, although the total colonoscopies had male dominance 2:1. In other word, cancer was detected among 13.9% of the total female colonoscopy patients whereas only 5.2% was found among males. This finding is different from what mentioned by Kayamba *et al* in their series. They reported no significant difference between male and female patients regarding tumor visualization during

colonoscopy (18% among females and 16% among males) [19]. Adenocarcinoma was the most common type of cancer. Our results are in agreement with studies of Bhat *et al* [23], Basaleem and Al-Sakkaf [24], and others [25,26].

CRC has long been considered a disease of old age associated with westernization. Fifty years is considered an average age for CRC occurrence, and the incidence increases with age. Cancer occurring before this age is considered young-onset CRC, which accounts for 5% to 7% of all CRC cases [27]. On the other hand, cancer sites proximal to splenic flexure are conveniently grouped as right-sided while any cancer in the rectum, sigmoid, descending colon and splenic flexure is defined as left-sided [28]. In the current study, CRC characterized by early age of onset and left sided subtype (48.3%) in the rectum. This was consistent with the study by Basaleem and Al-Sakkaf who also found high proportion of early-onset tumor (19.3% of cases were <40yrs) and left sided (49.4% were in the rectum and rectosigmoid junction) [24]. This study is in consistence with a study in Kashmir by Bhat *et al*, who reported that CRC was most common in age group 56-65 years and 19.25% of patients were below 35 years. They found 44% of the CRC in rectum [23]. Amini *et al* in Karachi found 52% of biopsy-proven CRC patients were below the age of 40 years and 70% of the patients had tumor of the left colon, particularly the rectum [28]. At a time where the incidence of CRC, a disease predominantly of developed nations, is showing a decline in those 50 years of age and older, data from the West is showing

a rising incidence of this cancer in young individuals. Central to this has been the 75% increase in rectal cancer incidence [29]. Although young-onset CRC raises the possibility of a hereditary component, hereditary CRC syndromes only explain the minority of young-onset CRC, consequently, the pathogenic mechanism in the majority of young-onset CRC cases remains to be elucidated [27].

In this study, a statistically significant association were found between cancer detection by colonoscopy and clinical presentations of constipation or change in bowel habits. However, Kayamba *et al* found association between tumor diagnosis and clinical detected rectal lesion or abdominal mass [19]. Alaties found that change in bowel habit was the second indication for colonoscopy and CRC were detected among 31.9% of these patients [11]. In the study of Hamilton *et al*, diarrhea and constipation were both associated with CRC in the multivariable analyses [30]. Whereas the study of Lee *et al* suggest that preoperative constipation severity is associated with advanced pathologic stage and poor oncologic outcomes in patients with rectal cancer [31].

In this study, no reported perforation or death occurred during colonoscopy. If perforations rate greater than 1 in 500 overall or greater than 1 in 1,000 in screening patients should raise concerns as to whether inappropriate practices are the cause of the perforations [8].

Conclusion

Detection of CRC is an important aim of most colonoscopic examinations. Symptoms of constipation as well as change in bowel habit should be handled cautiously and may deserve colonoscopic examination.

Acknowledgement

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