

Lower Gastrointestinal Endoscopy Findings at Al-Gamhoria Teaching Hospital, Aden, Yemen

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Abstract

Introduction: Colonoscopy is an effective modality for diagnosis and treatment of lower gastrointestinal conditions. However, there are limited data regarding the diagnostic yield of colonoscopy in Al-Gamhoria Teaching Hospital. This study aimed to describe the characteristics, indications, findings and completion rate of colonoscopy at Al-Gamhoria Teaching Hospital.

Methods: A retrospective analysis of colonoscopy records was conducted in a period of 15 months (January 2014 to March 2015) at Al-Gamhoria Teaching Hospital. All patients' records of lower gastrointestinal endoscopy (LGIE) were reviewed and relevant information were retrieved. The Statistical Package for Social Science (SPSS, 20) was used for data entry and analysis.

Result: Colonoscopy was performed for a total of 151 patients (88 males and 63 females) with a mean age of 47.2 ± 17.3 years (ranged 9-86 years). General surgeons performed 90.7% of the endoscopies, the remaining were done by gastroenterologists, and all procedures were diagnostic. Bleeding per rectum (53.8%), abdominal pain (30.8%), constipation (11.5%) and anemia (7.7%) were the commonest indications for endoscopy. Colorectal cancer (14.6%), haemorrhoids (11.9%), polyps (10.6%) and colitis (7.3%) were the commonest endoscopic findings. Normal endoscopy was reported in 49% of patients and caecal intubation (complete colonoscopy) was successful in 67.5% of cases.

Conclusion: Satisfactory use and yields of colonoscopy can be ensured in a scarce-resource setting.

Keywords: Lower Gastrointestinal Tract, Endoscopy, Indications, Findings, Aden.

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تنظير الجهاز الهضمي السفلي في مستشفى الجمهورية التعليمي، عدن، اليمن

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ملخص الدراسة

المقدمة: يعتبر تنظير القولون طريقة فعالة لتشخيص وعلاج أمراض الجهاز الهضمي السفلي. هناك بيانات محدودة تتعلق بالحصيلة التشخيصية لتنظير القولون في مستشفى الجمهورية التعليمي. هدفت هذه الدراسة إلى وصف خصائص ودواعي ونتائج ومعدل إكمال تنظير القولون في مستشفى الجمهوري التعليمي.

المنهجية: أجري تحليل استعادي لتقارير تنظير القولون خلال فترة 15 شهرًا، من يناير 2014 إلى مارس 2015، في مستشفى الجمهورية التعليمي. تمت مراجعة سجلات جميع المرضى الذين خضعوا للتنظير الهضمي السفلي واستخرجت المعلومات ذات الصلة. تم استخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS, 20) لإدخال البيانات والتحليل الإحصائي.

النتائج: تم تنظير ما مجموعه 151 مريضاً، 88 ذكور و63 إناث مع متوسط عمر 47.2 ± 17.3 سنة (المدى من 9 إلى 86 عاماً). أجرى الجراحون العامون 90.7% من المناظير، والباقي من قبل أطباء أمراض الجهاز الهضمي، وكانت جميع الحالات تشخيصية. كان النزيف عبر المستقيم (53.8%)، وآلام البطن (30.8%)، والإمساك (11.5%) وفقر الدم (7.7%) أكثر الدواعي شيوعاً للتنظير. كان سرطان القولون والمستقيم (14.6%)، والبيواسير (11.9%)، والأورام الحميدة (10.6%) والتهاب القولون (7.3%) أكثر النتائج شيوعاً بالمنظار. نتيجة المنظار كانت طبيعية في 49% من المرضى وتنظير القولون الكامل كان ناجحاً في 67.5% من الحالات.

الاستنتاج: يمكن إجراء تنظير القولون بفعالية مع الحصول على نتائج جيدة في بيئة شحيحة الموارد.

الكلمات المفتاحية: الجهاز الهضمي السفلي، التنظير، الدواعي، النتائج، عدن.

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Introduction

Direct visualization of the gastrointestinal mucosa following the development of the flexible fiber-optic endoscope, four decades ago, has afforded the gastroenterologist and the surgeon an easy and reliable mean of investigating and treating conditions of the gastrointestinal tract [1]. It is the investigation of choice for many gastrointestinal diseases [2].

Lower gastrointestinal endoscopy (LGIE) is used to investigate a myriad of symptoms due to diseases of the rectum and colon. Colorectal endoscopy is mandatory in average risk patients who are faecal occult blood test positive or bleed per rectum [3-5]. The procedure aids in the diagnosis of pre-malignant lesions and early carcinomas. It has been shown that this approach significantly reduced mortality from colorectal carcinoma [6,7]. Gastrointestinal endoscopy has undergone a remarkable expansion in its capabilities as a result of sophisticated technological advances. These advances helped to overcome the main limitations of the procedure such as its invasiveness and discomfort [8].

The increasing and widespread use of endoscopy, for clinical and screening purposes, rises clear demand for those who perform the procedure. Traditionally, and since its innovation, endoscopy was performed by gastroenterologists, but is currently being performed by different medical specialists including surgeons and family physicians [9-11].

A good quality endoscopy has two aspects: good equipment and well-trained endoscopy team. The concept "quality of endoscopic procedure" is getting more importance, because of its implications on the diagnosis and treatment of gastrointestinal diseases. Many efforts have been made by different bodies in different parts of the world to develop standards for the different aspects of endoscopy practice [12,13]. In developed countries these standards can be easily achieved but in a developing country, due to lack of the main requirements for good quality endoscopy, a study revealed standards that were below the international standards [14].

This study aimed to determine the personal characteristics of patients subjected to LGIE (age, sex and place of residence), the indications (clinical features), diagnostic yield (endoscopic findings) and LGIE completion rate at Al-Gamhoria Teaching Hospital, Aden, Yemen

Methods

A retrospective analysis of colonoscopy records was conducted in 15 months' period (January 2014 to March 2015) at Al-Gamhoria Teaching Hospital. The gastrointestinal endoscopy unit receives patients from outpatients' clinics and from the medical and surgical departments of the hospital as well as direct referrals from other health facilities in Aden and neighboring governorates.

All patients' records of lower LGIE were reviewed and relevant information were retrieved including patients' characteristics, indications

for endoscopy, endoscopic findings and completion rate were extracted using a form. This form was designed in a way that facilitates data entry and analysis. Some endoscopists did not routinely report the indication for endoscopy (clinical presentations) and place of residence of the patients leaving some records with missed data. During analysis, the frequencies of these variables were calculated from the total number of patients with complete data excluding those with missed information.

Following standard procedures [2], colonoscopic evaluation of patients was performed using Pentax fiber optic colonoscope and. Instrument sterilization was done using a routine technique of cleaning the instruments with antiseptics and water. There is no flexible sigmoidoscope in our center and so the colonoscope was used for performing flexible sigmoidoscopy, when indicated, by limiting the examination to only the left colon up to the descendo-sigmoid junction. Colonoscopy was considered complete by caecal intubation verified by endoscopic visualization of the ileocaecal valve and appendiceal orifice or by intubating the terminal ileum, when necessary. It was considered incomplete if the caecum was not reached. Photo documentation was not routinely performed due to absence of the required equipment. Most of the patients had LGIE as an elective, outpatient procedure. The endoscopy team during the period of study consisted of two general surgeons and gastroenterologist.

Statistical data analysis was performed using the Statistical Package for Social Science (SPSS) for Windows version 20. Description of qualitative variables were expressed as frequencies and quantitative variables as means \pm standard deviation (SD).

Permission to perform the study was obtained from the authority in Al-Gamhoria Teaching Hospital and ethical approval was obtained from the Research and Ethics Committee of the Faculty of Medicine and Health Sciences, University of Aden.

Results

One hundred fifty-one patients were subjected to LGIE during the fifteen-months' study period (January 2014 to March 2015). The mean age of the patients was 47.2 ± 17.3 years (ranged 9-86 years). Patients' age ranged from childhood to old age. However, those in the fifth and sixth decades constituted the largest percentages (18.5% and 22.5%, respectively), followed by those in the third decade (13.9%).

There were 58.3% males and 41.7% females. Most of the patients came from Aden governorate (55.1%) followed by those from neighboring governorates of Lahej and Abyan (15.7% and 11.0%, respectively). Personal characteristics of colonoscopy patients are shown in Table 1.

Table 1: Personal Characteristics of Colonoscopy Patients

Characteristics	No.	%*
Sex (n=151)		
Male	88	58.3
Female	63	41.7
Age (n=151)		
0 - 9	1	0.7
10-19	7	4.6
20-29	21	13.9
30-39	19	12.6
40-49	28	18.5
50-59	34	22.5
60-69	19	12.6
70-79	18	11.9
80-89	4	2.6
< 50	76	50.3
≥ 50	75	49.7
Range [Mean ± SD] 9-86 [47.24 ± 17.31]		
Place of residence (n=127)		
Aden	70	55.1
Lahej	20	15.7
Abyan	14	11.0
Taiz	5	3.9
Al-Dala'a	4	3.1
Shabwah	4	3.1
Hadramoot	4	3.1
Other	6	4.7

*Percentages were calculated from the total number of related characteristics.

Of all the LGIE, 90.7% were performed by general surgeons and the remaining by gastroenterologists. Competency in endoscopy was specifically evaluated by calculating the caecal intubation rate. Caecal intubation was successful in 67.5% of cases (complete colonoscopy). The sigmoidoscopy and incomplete colonoscopy represented 13.2% and 19.2%, respectively. All procedures were diagnostic. The most common indications for LGIE were bleeding per rectum (53.8%) and abdominal pain (30.8%). Less common indications were constipation (11.5%), anemia (7.7%) and mucus/pus discharge per rectum (7.7%). Table 2 shows all indications for LGIE.

Table 2: Indications for Colonoscopy and Sigmoidoscopy (n=26)

Indications	No.	%*
Bleeding per rectum	14	53.8
Abdominal pain	8	30.8
Constipation	3	11.5
Anemia	2	7.7
Mucus/pus discharge per rectum	2	7.7
Diarrhea	1	3.8
Rectal mass	1	3.8
Tenismus	1	3.8
Abnormal radiology	1	3.8

*All percentages were calculated from the total number of patients who had their indications for endoscopy recorded (26).

Percentages cannot be summed to 100% as some patients had more than one indication

As shown in Table 3, about half of the LGIE showed normal findings (49%). Colorectal cancer (14.6%), Haemorrhoids (11.9%) and polyps (10.6%) were the most common endoscopic findings. There were 11 cases of colitis (7.3%).

Table 3: Findings of Colonoscopy and Sigmoidoscopy (n=151)

Endoscopic findings	No.	%*
Normal	74	49.0
Colorectal cancer	22	14.6
Haemorrhoids	18	11.9
Polyps	16	10.6
Stenosis	14	9.3
Colitis	11	7.3
Diverticulosis	7	4.6
Others	8	5.3

*All percentages were calculated from the total number of patients (151).

Percentages cannot be summed to 100% as some patients had more than one finding.

Table 4 shows the characteristics of some of the endoscopic findings. Among the 22 patients with colorectal cancer, the rectum was the commonest site (72.7%). Most of the polyps were found in the rectum and left colon (37.5% each) and were single in number in 62.5% of

patients. In three out of eleven patients with colitis; the type of colitis was identified endoscopically as inflammatory bowel disease, the rest with no specific type. Stenosis/obstruction of the colorectum was found in 14 patients. The common site of stenosis was the rectum (57.1%) and the stenosis was severe and could not pass through it in 9 (64.3%) patients.

Table 4: Characteristics of Some Endoscopic Findings

Endoscopic findings	No.	%*
Colorectal cancer (n=22)		
Rectum	16	72.7
Left colon	6	27.3
Right colon	0	0.0
Polyyps site (n=16)		
Left colon	6	37.5
Rectum	6	37.5
Right colon	2	12.5
Pancolic	2	12.5
Polyyps number (n=16)		
Single	10	62.5
Multiple	6	37.5
Colitis type (n=11)		
Not identified	8	72.7
Inflammatory bowel disease	3	27.3
Stenosis site (n=14)		
Rectum	8	57.1
Left colon	6	42.9
Stenosis degree (n=14)		
Cannot pass through	9	64.3
Can pass through	5	35.7

*Percentages were calculated from the total number of related finding.

Discussion

It is difficult to objectively determine good quality endoscopy from a poorly performed one without observing the procedure. Practical measures of quality have been developed by different bodies to assure the quality of an endoscopic

procedure. The American Society for Gastrointestinal Endoscopy (ASGE) and the American College of Gastroenterology (ACG) Taskforce on Quality in Endoscopy has identified a 90% caecal intubation rate as the standard and one of the basic characteristics of good quality lower GI endoscopy [15]. Similar criteria were set by the US Multi-Society Taskforce on Colorectal Cancer [16]. Reports have suggested that some centers achieve this standard for colonoscopy easily [17-19]. However, other reports suggest that this may not be widespread [20-22]. Our caecal intubation rate of 67.5% is higher than 30.4% reported in Ghana [1], comparable to 67.3% in Nigeria [24], but lower than the recommended 90% in the West. We believe that limitation in equipment may be a major factor in our study. While video endoscopes are considered standard equipment in the West and there is a wide range of endoscopes to choose from, during the study period, only a single functioning fibre-optic colonoscope were in place. Another factor may be training. Training have been shown to be useful in improving caecal intubation rates [21].

The most common indication for LGIE in this study was bleeding per rectum (53.8%). This is comparable to the findings of Ismaila and Misauno [24] in Nigeria (2013) and Kamdem *et al* [25] in Cameroon (2018). In the west, the most common indication is colorectal cancer screening as reported by Kolber *et al* [23] in Canada (2009).

The endoscopic finding of colorectal cancer (14.6%) as the most common finding was in contrast to many other

reports which showed a lower frequency of cancer. Kamdem *et al*, Ismaila and Misauno and Kolber *et al* reported colorectal cancer frequencies of 5.8%, 4.4% and 2.1%, respectively [23-25]. In these reports, hemorrhoids and polyps were the most common diagnosis [23-25]. However, biopsy and histopathology are the standard for diagnosis of colorectal cancer and endoscopic findings will be more accurate if confirmed by pathological diagnosis.

The percentage of normal colonoscopy finding in the present study (49%) was higher than the results of many other studies (35.5%, 38.2% and 39.5%) [23-25]. On the other hand, the figure of haemorrhoids in the present study (11.9%) is lower than the reported findings of these studies (27.9%, 21.8%) [24,25]. A possible explanation for these results is omitting retroflexion of the colonoscope in the lower part of rectum which should be done routinely in all cases in order to diagnose anal conditions including haemorrhoids. However, the normal endoscopy rate needs to be reduced by careful selection of the patients in order to help prolong the lives of the endoscopies.

The apparent increase in the incidence of colorectal cancer will require colonoscopy for earlier diagnosis and perhaps prevention. The important factors in providing good quality colonoscopy include; equipment improvement and maintenance, training of the endoscopic team and adequate number of endoscopists including gastroenterologists and surgeons.

The current study was limited by its retrospective nature and relatively small number of patients. In addition, lack of sedation, especially for colonoscopy, makes the procedure more difficult and sometimes not possible.

Conclusion

Satisfactory use and yields of colonoscopy can be ensured in a scarce-resource setting. There are some differences in the endoscopic findings of LGIE which were carried out at Al-Gamhoria Teaching Hospital when compared with the reported results in the literature. Further studies, including correlation of endoscopic diagnosis with pathological diagnosis, are needed to explain these results. In addition, equipment improvement is required for the provision of quality endoscopic services and more training and retraining is needed to improve caecal intubation rates.

References

1. Dakubo JCB, Kumoji R, Naaeder SB, Clegg-Lampsey JN. Endoscopic evaluation of the colorectum in patients presenting with haematochezia at Korle-Bu Teaching Hospital Accra. Ghana Med J 2008;42(1):33-7.
2. Adam HA, Jonathan CO, Brian SA, Peter CO, Christopher WI. Cotton and Williams' Practical Gastrointestinal Endoscopy, The Fundamentals. 7th Edition. Indianapolis: J Wiley, 2014.
3. Byers T, Levin B, Rothenberger D, Dodd GD, Smith RA. American Cancer Society guidelines for screening and

- surveillance for early detection of colorectal polyps and cancer: update 1997. *CA Cancer J Clin* 1997;47(3):154-60.
4. Lewis JD, Shiln CE, Blecker D. Endoscopy for haematochezia in patients under 50 of age. *Dig Dis Sci* 2001;46(12):2660-5.
 5. Acosta JA, Fournier TK, Knutson CO, Ragland JJ. Colonoscopic evaluation of rectal bleeding in young adults. *Am Surg* 1994;60(11):903-6.
 6. Nishihara R, Wu k, Lochhead P, Morikawa T, Liao X, Qian ZR, *et al.* Long-term colorectal-cancer incidence and mortality after lower endoscopy. *N Engl J Med* 2013;369(12):1095-105.
 7. Doubeni CA, Corley DA, Quinn VP, Jensen CD, Zauber AG, Goodman M, *et al.* Effectiveness of screening colonoscopy in reducing the risk of death from right and left colon cancer, a large community-based study. *Gut* 2018;67(2):291-98.
 8. Kwan V. Advances in gastrointestinal endoscopy. *Intern Med J* 2012;42(2):116-26.
 9. Wells CW. The characteristics of an excellent endoscopy trainer. *Frontline Gastroenterology* 2010; 1:13-8.
 10. Williams J, Russell I, Durai D, Cheung WY, Farrin A, Bloor K, *et al.* Effectiveness of nurse delivered endoscopy: findings from randomised multi-institution nurse endoscopy trial (MINuET). *BMJ* 2009;338: 231.
 11. Hilsden RJ, Tepper J, Moayyedi P, Rabeneck L. Who provides gastrointestinal endoscopy in Canada?. *Can J Gastroenterol* 2007;21(12):843-6.
 12. American Society for Gastrointestinal Endoscopy. Appropriate use of gastrointestinal endoscopy. *Gastrointest Endosc* 2000;52(6):831-7.
 13. Cohen J, Pike IM Defining and measuring quality in endoscopy. *Gastrointest Endosc* 2015; 81(1):1-2.
 14. Watermeyer G, Van Wyk ME, Goldberg BA. Audit of provincial gastroenterology services in the Western Cape. *S Afr J Surg* 2008;46(3):68-72.
 15. Rex DK, Petrini JL, Baron TH, Chak A, Cohen J, Deal SE, *et al.* (ASGE/ACG Taskforce on Quality in Endoscopy) Quality indicators for endoscopy. *Gastrointest Endosc* 2006;63(4): 16-28.
 16. Rex DK, Bond JH, Winawer S, Levin TR, Burt RW, Johnson DA, *et al.* Quality in the technical performance of colonoscopy and the continuous quality improvement process for colonoscopy: recommendations of the U S Multi-Society Task Force on Colorectal Cancer. *Am J Gastroenterol* 2002; 97 (6):1296-308.
 17. Lieberman DA, Weiss DG, Bond JH, Ahnen DJ, Garewal H, Chejfec G. Use of colonoscopy to screen asymptomatic adults for colorectal cancer: Veterans Affairs Cooperative Study Group 380. *N Engl J Med* 2000;343(3): 162-8.
 18. Wexner SD, Garbus JE, Singh JJ. the SAGES Colonoscopy Outcomes Study Group. A prospective analysis of 13, 580 colonoscopies: Re-evaluation of credentialing guidelines. *Surg Endosc* 2001;15(3) 251-61.
 19. Hoff G, Holme Q, Bretthauer M, Sandvei P, Darre-Naess O, Stallemo A, *et al.* Cecum intubation rate as quality indicator in clinical versus

- screening colonoscopy. *Endosc Int Open* 2017;5(6):489-95.
20. Bowles CJA, Leicester R, Romaya C, Swarbrick E, Williams CB, Epstein O. A prospective study of colonoscopy practice in the UK today: are we adequately prepared for national colorectal screening tomorrow. *Gut* 2004;53(2):277-83.
21. Ball JE, Osborne J, Jowett S, Pellen M, Welfare MR. Quality improvement programme to achieve acceptable colonoscopy completion rates: prospective before and after study. *BMJ* 2004;329 (7467):665-7.
22. de Jonge V, Sint Nicolaas J, Cahen DL, Moolenaar W, Ouwendijk RJ, Tang TJ, *et al.* Quality evaluation of colonoscopy reporting and colonoscopy performance in daily clinical practice. *Gastrointest Endosc* 2012;75(1):98-106.
23. Kolber M, Szafran O, Suwal J, Diaz M. Outcomes of 1949 endoscopic procedures performed by a Canadian rural family physician. *Can Fam Physician* 2009;55(2):170-5.
24. Ismaila BO, Misauno MA. Gastrointestinal endoscopy in Nigeria-a prospective two-year audit. *Pan Afr Med J* 2013;14(22):1865.
25. Kamdem J, Palmer D, Barrier C, Bardin R, Brown J, Topazian M. Diagnostic yield of gastrointestinal endoscopy in North West Region Cameroon and trends in diagnosis over time. *Pan African Med J* 2018; 29:178.