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Patterns of Lower Gastrointestinal Endoscopic Findings at Jimma University Medical Center, Jimma, Ethiopia

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ABSTRACT

Background: Lower gastrointestinal (GI) disorders are common causes of morbidity worldwide, yet data on their prevalence and patterns within resource-limited settings like Ethiopia remain scarce. Endoscopy is a vital diagnostic and therapeutic tool for these conditions.

Objectives: To assess the patterns of lower GI endoscopic findings at Jimma University Medical Center (JUMC) and explore associations with demographic and clinical variables.

Methods: This retrospective, descriptive cross-sectional study included 216 adult patients (≥15 years) who underwent lower GI endoscopy at JUMC from September 9, 2021, to September 8, 2022. Patients with incomplete records or repeat procedures were excluded. Data on demographics, indications, and findings were collected using a structured tool and analyzed with SPSS v29.0. Descriptive statistics summarized the data; chi-square and multivariate logistic regression tested associations, with significance at $p<0.05$.

Results: Of 230 procedures, 216 met inclusion criteria. The mean age was 43.6 ± 16.2 years, with a male predominance (68.5%). The most common indication was lower GI bleeding (35.2%). Hemorrhoids were the most frequent endoscopic finding (46.3%), followed by colorectal polyps (21.2%) and colorectal cancer (11.1%). Benign lesions predominated, but the notable prevalence of polyps and cancers underscores the importance of early detection strategies.

Conclusions: Benign conditions, especially hemorrhoids, are prevalent among patients undergoing lower GI endoscopy at JUMC. However, the significant rates of polyps and cancers underscore the importance of expanding endoscopic services, enhancing training, and implementing community screening programs to improve early detection and management.

KEYWORDS: Lower gastrointestinal tract, endoscopy, hemorrhoids, polyps, colorectal cancer, Ethiopia

INTRODUCTION

Disorders affecting the lower gastrointestinal (GI) tract, including the colon, rectum, and anus [1] are major contributors to global morbidity, imposing significant clinical and economic burdens worldwide [2, 3]. The increasing incidence of GI cancers, particularly colorectal cancer (CRC), is a notable concern, with CRC ranking as the third most diagnosed cancer and the second leading cause of cancer-related mortality globally [4]. Projections estimate a 60% rise in new CRC cases by 2030[5], underscoring the urgent need for effective detection and management strategies.

In addition to malignancies, inflammatory bowel disease (IBD), with over 3.5 million cases reported in the US and Europe, causes recurrent relapses and complications contributing substantially to high healthcare utilization and patient suffering [6, 7].

Endoscopy, encompassing colonoscopy and sigmoidoscopy, has revolutionized the diagnosis and management of these conditions by enabling direct visualization, biopsy, and therapeutic interventions. Despite its vital role, access to endoscopic services varies widely across countries, and data on the prevalence and pattern of lower GI diseases in Ethiopia remain limited [8-12].

This paucity of information hampers targeted healthcare planning and appropriate resource allocation, especially in resource-constrained settings where infrastructure continues to develop. Recognizing this gap, understanding the local disease patterns is essential for designing effective screening programs, early detection strategies, and optimal management protocols.

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This study aims to describe the patterns of lower GI endoscopic findings at Jimma University Medical Center, Ethiopia, thereby contributing valuable insights to improve gastrointestinal health outcomes and inform health policy in the region.

METHODS AND MATERIALS

Study Area and Period

This study was conducted at Jimma University Medical Center (JUMC), a regional referral hospital located in Jimma, Southwest Ethiopia. The endoscopy unit was established in May 2016 and offers both upper and lower gastrointestinal (GI) endoscopic procedures. The facility serves a diverse population from surrounding urban and rural areas. The study period spanned from September 9, 2021, to September 8, 2022.

Study Design

A retrospective, cross-sectional descriptive study was employed to analyze lower gastrointestinal endoscopy reports and medical records of patients who underwent lower gastrointestinal endoscopy during the study period

Study Population

The study population comprised all adult patients (aged 15 years and above) who underwent lower GI endoscopy at JUMC during the study period and met the inclusion criteria.

Eligibility Criteria

The study included all adult patients who underwent lower gastrointestinal endoscopy during the specified study period. Patients were excluded if their medical records were incomplete or if they had undergone repeat procedures within the same period, in order to ensure data accuracy and independence of observations.

Sample Size and Sampling Method

Since the study included all eligible cases within the specified period, a total enumeration approach was adopted, and no sampling was required. A total of 216 patient records met the inclusion criteria and were analyzed.

Data Collection

Data were extracted from patient medical records, endoscopy report forms, and registry books maintained by the endoscopy unit. A structured data collection tool was developed based on a review of relevant literature and existing protocols. This tool captured socio-demographic data (age, sex, residency), clinical indications for endoscopy, endoscopic findings, and histopathological results when available. Data collectors, two trained health professionals (general practitioners), reviewed the charts independently to ensure accuracy. Prior to data collection, a pre-test was conducted on 20 randomly selected charts outside the main study population to refine the data collection process and ensure clarity of the tool.

Data Quality Assurance

To maintain data integrity, training sessions were provided to data collectors on the use of the data collection tool and study protocols. Daily supervision and review meetings were held to monitor completeness, consistency, and accuracy of data collection. Discrepancies were resolved through discussion with a senior investigator.

Variables

The dependent variable was the endoscopic findings, which included normal, benign, malignant, and other pathologies observed during the procedures. The independent variables comprised demographic and clinical factors such as age, sex, residence, and the specific indication for performing the endoscopy.

Data Analysis

Data were entered into EpiData version 3.1, cleaned, and exported to SPSS version 29.0 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, summarized socio-demographic and clinical variables. Associations between categorical variables, such as demographic factors and endoscopic findings, were assessed using the chi-square test of independence. The p-value threshold for statistical significance was set at <0.05.

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Multivariate logistic regression analysis identified factors independently associated with specific endoscopic diagnoses. Variables with a p-value <0.2 in bivariate analysis or deemed clinically relevant were included in the multivariable model. Model assumptions, including multicollinearity and goodness-of-fit, were checked to ensure robustness.

Ethical Considerations

The study protocol was approved by the Jimma University Medical Center Institutional Review Board (IRB) (IRB No. JUIH/IRB/249/22). Confidentiality of patient data was maintained throughout the study by anonymizing records and restricting access to authorized personnel. Since all data were retrospective and de-identified, a waiver of informed consent was granted by the IRB.

Standardized and operational definition of terms

Adults- who are greater than 15 years of age

Endoscopy: flexible instruments that combine fiber optics and charge-coupled devices to facilitate illumination and visualization of otherwise inaccessible sites, such as the lumen of hollow organs.

Colonoscopy: a lower GIE, which allows examination of the entire colon and rectum and frequently the terminal ileum.

IBD: a term for two conditions (Crohn's disease and ulcerative colitis) that are characterized by chronic inflammation of the GI tract. Prolonged inflammation results in damage to the GI tract (ulceration, stricture, fistula formation).

Crohn disease: chronic inflammation of the GI tract (may involve anywhere between the mouth and the perianal area) characterized by transmural inflammation and by skip areas of involvement.

Ulcerative colitis is a chronic inflammatory condition characterized by relapsing and remitting episodes of inflammation limited to the mucosal layer of the colon.\

IBS: functional bowel disorder characterized by abdominal pain or discomfort and altered bowel habits in the absence of detectable structural abnormalities. There are no definitive diagnostic markers for this condition.

Hematochezia: passage of red or maroon blood from the rectum

Melena: black, tarry stool

Benign lesions: lesions identified during endoscopy as hemorrhoids, non-neoplastic polyps, inflammatory conditions, or other non-malignant abnormalities confirmed by endoscopic appearance and, where available, histopathology.

Malignant lesions: lesions identified as tumors that are histopathologically confirmed as colorectal cancer or other GI malignancies.

Normal findings: endoscopy reports indicating no visible abnormalities or normal mucosal appearance.

RESULTS

A total of 230 lower gastrointestinal endoscopies were performed over a one-year period from September 2021 to September 2022, of which 216 met the inclusion criteria. The patients' ages ranged from 18 to 76 years, with a mean age of 43.6 years (SD ± 16.2). Approximately 84 (38.9%) of the 216 procedures were conducted on patients older than 45 years. Males accounted for 148 (68.5%) of the lower GI endoscopies performed during the study period. Regarding residence, 130 (60.3%) participants were from rural areas, while 86 (39.7%) were urban residents.

Indications for undergoing lower GI endoscopic examination

Among the 216 patients who underwent lower gastrointestinal endoscopy (LGIE), the most common indication was lower GI bleeding, accounting for 76 cases (35.18%). This was followed by suspicion of colorectal cancer (CRC) in 52 cases (24.07%) and inflammatory bowel disease (IBD) in 20 cases (9.25%). Additionally, 16 patients (7.4%) were evaluated for chronic diarrhea. Other less frequent indications included chronic abdominal pain, unexplained iron deficiency anemia, indigestion, screening, constipation, and the presence of a cecal mass on imaging (Table 1).

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Table 1. Indication for undergoing lower gastrointestinal endoscopic examination among the study partipants at JUMC Endoscopy unit, 2022.

Variables	Indication for LGIE	Frequency (n=216)	Percent(%)
Lower GI Endoscopy	LGIB	76	35.18
	R/O CRC	52	24.07
	R/O IBD	20	9.25
	Chronic diarrhea	16	7.4
	Unexplained IDA	8	3.7
	Indigestion	8	3.7
	LBO	8	3.7
	Abdominal pain	8	3.7
	Others[1]	20	9.26

Others[1]: screening, constipation, and caecal mass on imaging.

Endoscopic findings among the study participants undergoing lower GI endoscopy

Isolated internal and/or external hemorrhoids were the most common colonoscopic diagnosis, identified in 100 patients (46.3%), followed by colorectal polyps found in 48 patients (21.2%). Colorectal and anorectal cancer was diagnosed in 24 patients (11.1%), with diverticulosis observed in 8 patients (3.7%) and lesions suggestive of inflammatory bowel disease (IBD) in 4 patients (1.85%). A normal colonoscopic study was reported in 20 patients (9.26%) (Table 2).

Table 2. Lower GI Endoscopy finding among the study participants at JUMC Endoscopy unit, 2022.

Variables	Finding	Frequency	Percent
Endoscopic finding	Internal and/or external hemorrhoid	100	46.3
	Colorectal and rectoanal polyp	48	21.2
	Colorectal ca and anorectal ca	24	11.1
	IBD	4	1.85
	Normal study	20	9.26
	Diverticulosis	8	3.7
	Others[2]	12	11

Others[2] indicates Colitis, redundant colon and intestinal parasitosis.

Pathology reports of lower GI endoscopic biopsy samples.

A total of 76 colorectal and anorectal lesions were evaluated, including 48 polyps and 24 cancers, alongside 4 cases of inflammatory bowel disease (IBD). Among the polyps, the most common histologic diagnoses were tubular adenoma (12 cases), tubular adenoma with high-grade dysplasia (10 cases), tubulovillous adenoma (8 cases), and villous adenoma with chronic nonspecific inflammation (6 cases). Additionally, rectal inflammatory polyps with chronic inflammatory colitis and recto-anal benign fibroepithelial polyps were each identified in 6 cases. Of the 16 colorectal and anorectal cancer cases, adenocarcinoma was confirmed in 14, with 2 cases remaining inconclusive. All IBD cases were diagnosed as ulcerative colitis (Table 3).

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Table 3: Histologic diagnosis of samples from LGI Endoscopy at Jimma Endoscopy unit,2022

Colonscopic finding	Frequency	Pathologic diagnosis	Frequency
Colorectal and anorectal polyp	48	Tubular adenoma	12
		Tubular adenoma with High grade dysplasia	10
		Tubulovillous Adenoma	8
		Villous adenoma+ chronic nonspecific inflammation	6
		Rectal inflammatory polyp + Chronic inflammatory colitis	6
		Recto anal benign fibroepithelial polyp	6
Colorectal and Anorectal Ca	24	Adenocarcnoma	22
		Inconclusive	2
IBD	4	Ulcerative Colitis	4

Lower gastrointestinal bleeding (LGIB) was the most common indication for lower GI endoscopy in this study, accounting for 76 cases (35.18%). Among these patients, the predominant finding was isolated hemorrhoids, observed in 48 patients (63.2%), followed by colonic polyps in 16 patients and colonic diverticulosis in 8 patients. Rectal cancer and normal findings were each identified in 2 patients. Males were more frequently evaluated for LGIB, with most patients aged between 35 and 45 years (Table 4).

Of the 52 patients evaluated for suspicion of colorectal cancer (CRC), 30 (53.8%) had isolated hemorrhoids, 12 had findings suggestive of CRC, 8 had colorectal polyps, and 2 had incomplete studies. Patients assessed for CRC suspicion were predominantly older than 45 years, with a significant association between this indication and older age (P = 0.03) (Table 4).

Among the 20 patients evaluated for inflammatory bowel disease (IBD), 8 had colorectal polyps, 8 had normal findings, and 4 had internal hemorrhoids with redundant colon.

Table 4. Age and sex distribution of major LGI Endoscopic indications and their associations

Variable	**Category**	**LGIB**		**X^2**	**P Value**	**Rule out CRC**		**X^2**	**P Value**	**Rule out IBD**		**X^2**	**P Value**
		Yes	**No**			**Yes**	**No**			**Yes**	**No**		
Sex	Male	60	88	5.036	0.025*	36	112	1.282	0.258	12	136	0.079	0.779
	Female	16	52			16	52			8	60		
Age (years)	<35	20	26	2.638	0.267	4	42	6.982	<0.03*	16	30	3.591	<0.166 *
	35-45	32	54			16	70			0	86		
	>45	24	60			32	52			4	80		

Key: * indicates variables associated with each endoscopic finding during chi-square analysis at p value <0.05.

Hemorrhoidal disease were the most common LGIE abnormality detected in our study and more commonly associated with males 19(76%) in this study (P=0.022). (Table 5)

Table 5. Factors associated with major lower GI Endoscopy findings among patients who had undergone lower GI Endoscopy at JUMC Endoscopy unit, 2022

Category	Yes n (%)	No n (%)	X^2	P Value
Hemorrhoidal Diseases				
Sex			5.232	0.022*
Male	76 (35.2)	72 (33.3%)		
Female	24 (11.1)	44 (20.4)		

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Age(years)				
<35	28 (12.9)	18 (8.3)	3.989	0.136
35-45	44 (20.4)	42 (19.4)		
>45	28 (12.9)	56 (25.9)		
Colorectal Polyp				
Sex				
Male	30 (13.8)	118 (54.6)	0.012	0.914
Female	18 (8.3)	50 (23.1)		
Age(years)				
<35	24 (11.1)	22 (10.2)	5.244	0.073
35-45	8 (3.7)	78 (36.1)		
>45	4 (1.9)	80 (37)		
Colorectal Cancer				
Sex				
Male	18(8.3)	130 (60.2)	0.73	0.393
Female	6 (2.7%)	62 (28.7)		
Age (Years)				
<35	0	46 (21.3)	3.834	0.147
35-45	4 (1.9)	82 (37.9)		
>45	10 (4.6)	74 (34.3)		

Key: * indicates variables associated with each endoscopic findings during chi-square analysis at p value <0.05

DISCUSSION

This study conducted at Jimma University Medical Center (JUMC) provides valuable insights into the patterns of lower gastrointestinal endoscopic findings within a resource-limited setting in southwest Ethiopia. There was significant male predominance 148(68.5%) in this study, consistent with the study in St. Paul hospital and Sudan [5,13]. In contrast, studies from USA and Brazil report a female predominance among patients undergoing colonoscopy [14,15].

LGIB was the commonest indication for lower GIE in our study, aligning with observations from other studies conducted both within Ethiopia and internationally.[5,13,15 - 17] However, studies from Iran and Egypt identified abdominal pain as the leading indication. [18,19].

The predominance of benign lesions, particularly hemorrhoids, aligns with findings from similar studies in low-resource environments [5,13,17], although it is rare a diagnosis or unreported in many other studies [14,20]. The high frequency of hemorrhoids (46.3%) among endoscopic findings underscores their clinical significance and suggests prioritization of conservative management and community awareness programs targeting modifiable risk factors such as diet, constipation, and lifestyle.

Colorectal polyps were found in 21.2% of patients, comparable to studies from Iran and Yemen but lower than reports from the USA and Nigeria.[14,16,18,20]. Lesions consistent with colorectal cancer were identified in 7.4% of cases, similar to previous studies in Ethiopia[21].This prevalence is higher than that reported from Brazil, Yemen, and Iran but lower than findings from India, Egypt, Nigeria, and Sudan.[14- 19]. These discrepancies may reflect differences in screening practices, population age distribution, and healthcare access.

The study also revealed that patients evaluated for colorectal cancer or suspected malignancy were predominantly older than 45 years and presented with more severe findings, such as polyps with dysplastic features or confirmed carcinoma. This aligns with global data demonstrating increased colorectal pathology with advancing age and emphasizes the importance of screening high-risk groups.

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Furthermore, the relatively low proportion of normal endoscopic findings (9.3%) compared to other studies [5, 15-17, 15, 16, 19] could be attributed to selection bias, as the study was conducted in a tertiary referral center, and possibly delayed patient presentation. This highlights the need for improved access to diagnostic services and earlier intervention to prevent disease progression.

CONCLUSIONS AND RECOMMENDATIONS

The majority of lower GI endoscopic findings are benign, predominantly hemorrhoids, but the presence of polyps and cancers underscores the need for early detection strategies. Expansion of endoscopy services with increased trained personnel, implementing community-based screening programs, especially targeting high-risk populations, and public health education on risk factors such as diet and lifestyle modifications are vital steps to improve gastrointestinal health outcomes in Ethiopia. This would enhance early detection and management of significant GI pathologies, reducing morbidity and mortality.

Limitations

This study is limited by its retrospective design, small sample size, and potential selection bias inherent to its setting in a tertiary referral center. To obtain more comprehensive and generalizable national data, prospective multicenter studies are recommended.

Declaration of Interest

We declare that there are no competing financial interests or conflict of interest that might have appeared to influence the work reported here.

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Annex 1 – Data Collection Tool
Credit - Beyan Mohammed Beshir

Section	Variable/Question	Response Format/Options
Sociodemographic characteristics	Card No	_____
	Age in years	_____
	Sex	Male Female
	Residential area	_____
Indication for lower GI Endoscopy		_____
Lower GI Endoscopy diagnosis		_____
Pathology Report		_____
Adminstrative	Name of Data Collector	_____
	signature	_____
	Date of Data Collection	_____
	Name and signature of supervisor	_____

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