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ORIGINAL ARTICLE

Prevalence and Pathological Findings Among Patients Who Underwent Colonoscopy for Lower Gastrointestinal Bleeding in the Endoscopy Unit at Bugando Medical Centre, Tanzania

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ABSTRACT

Background: Lower gastrointestinal (GI) bleeding is a significant clinical issue globally, contributing to morbidity and healthcare resource utilization. Despite its impact, there is limited epidemiological data on its prevalence and associated factors in Tanzania, particularly at Bugando Medical Centre, a major referral hospital. Understanding these factors is crucial for improving diagnostic and therapeutic strategies.

Objective: This study aimed to determine the prevalence of LGIB among patients who attended the Colonoscopy Unit at Bugando Medical Centre and to identify the factors associated with LGIB.

Methods: A retrospective cross-sectional study was conducted at Bugando Medical Centre. Data were extracted from medical records of 340 patients who underwent colonoscopy between January and December 2023. After excluding incomplete records, 327 patients were included in the final analysis. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 25.

Results: The prevalence of LGIB among the patients was 72.8%. A cross-sectional analysis at Bugando Medical Centre found that lower gastrointestinal bleeding (LGIB) was significantly associated with female sex (93.6% females vs. 53.5% males; $P<.004$) and hypertension (94.0% hypertensive patients; $P<.001$). Additionally, prior surgery for gastrointestinal (GI) issues significantly increased LGIB risk (81.8%; $P=<.03$).

Conclusion and Recommendations: The study concluded that LGIB is prevalent among patients at Bugando Medical Centre, with several factors significantly associated with its occurrence. It is recommended to implement enhanced screening and diagnostic protocols, patient education on lifestyle modifications, improved access to healthcare services, and comprehensive management plans. Further research is needed to explore the histological patterns of colitis among patients who presented with lower GI bleeding, since there is higher percentage of colitis among this group.

BACKGROUND

Lower gastrointestinal (GI) bleeding is a significant clinical problem worldwide, with a substantial impact on healthcare systems.[1] It is defined as bleeding originating from a source distal to the ligament of Treitz, which marks the division between the upper and lower GI tracts.[2] It is caused by various conditions, including neoplasms such as colon cancer and colon polyps, inflammatory bowel diseases, diverticulosis, angiodysplasia, intussusception, Meckel's diverticulitis, anorectal diseases, infectious colitis, and endometriosis.[3,4] Among these, diverticulosis and angiodysplasia are the most common causes. Globally, lower GI bleeding accounts for approximately one-fifth of all GI hemorrhages requiring hospital admission.[5]

The prevalence of lower GI bleeding varies by region. In Western countries, the annual incidence is estimated to be around 20–27 cases per 100,000 population.[6] However, the incidence can be as high as 87 cases per 100,000 individuals per year in certain populations.[6] The diagnostic yield of colonoscopy for lower GI bleeding ranges from 48% to 90%, and urgent colonoscopy appears to increase this yield.[7,8] In Africa, including Tanzania, the prevalence is not well-documented.[9] However, a study in Uganda reported that 20% of cases resembled lower gastrointestinal bleeding,[10] while research in Rwanda found that colorectal cancer and hemorrhoids were the most common causes in middle-aged and elderly patients.[11] Colonoscopy plays a crucial role in the management of lower GI bleeding. It is considered the gold standard for diagnosis and can also be therapeutic.[12,13] Colonoscopy allows for direct visualization of the colonic mucosa, identification of the bleeding source, and interventions such as polypectomy or cauterization to stop the bleeding.[14]

Despite the critical role of colonoscopy in diagnosing and managing lower gastrointestinal bleeding, there is limited epidemiological data on its burden and

associated factors in Tanzania, particularly at Bugando Medical Centre. This study aimed to determine the prevalence and associated factors of lower gastrointestinal bleeding among patients undergoing colonoscopy at a tertiary referral hospital. Although hospital-based, the findings are important for improving clinical decision-making, optimizing resource allocation, and guiding future research in similar settings.[15,16] Although colonoscopy is also an important screening tool for colorectal cancer and other colorectal diseases among asymptomatic individuals, this study focused on patients presenting with symptoms suggestive of lower gastrointestinal bleeding who underwent colonoscopic evaluation.

METHODOLOGY

Study Area

The study was conducted at Bugando Medical Centre (BMC), a tertiary referral hospital located in Mwanza City, northwestern Tanzania. BMC was established in 1971 and serves as a major referral facility for the Lake Zone regions of Tanzania. The hospital provides specialized and comprehensive healthcare services and functions as a teaching hospital affiliated with Catholic University of Health and Allied Sciences (CUHAS). It has a bed capacity of approximately 1,000 eds and provides services including: General medical & surgical specialties, specialized care, oncology care, diagnostic and outpatient services and premium wards. The hospital was selected because it receives a large number of patients from multiple regions, has specialized diagnostic and treatment facilities, and maintains clinical records suitable for retrospective data review.

Study Design

The study involved a retrospective review of medical records of patients who underwent colonoscopy during the study period. Participants were identified from endoscopy records, and relevant clinical and pathological information was extracted from existing files. No prospective follow-up was performed; therefore, this study did not involve a cohort follow-up component. The review of patient records lasted from January to December, 2023. Data collection and analysis were conducted between September, 2024 to February, 2025.

Study Population and Eligibility

The study included adult patients (≥18 years) who underwent colonoscopy at BMC within the study period. Records with incomplete data or unclear endoscopy findings were excluded to ensure data integrity. Patients included in the study were those referred for colonoscopy based on documented clinical evidence of lower gastrointestinal bleeding, including reported hematochezia, melena, or positive clinical assessment by the treating clinician. Colonoscopic findings were extracted from endoscopy reports available in patients' records.

Sample Size and Sampling

Based on hospital records and Taro Yamane's formula, the estimated sample size was 264. However, a census sampling technique was used, including all available records. A total of 340 patient records were reviewed, and after excluding incomplete records, 327 were included in the final analysis.

Data Collection and Data Analysis

Data were extracted from electronic medical records using a structured checklist covering demographic details, comorbidities, history of GI surgery, clinical presentation, and colonoscopy findings. Data extraction was performed by trained personnel to ensure consistency and accuracy. Data were cleaned, coded, and analyzed using SPSS version 25. Descriptive statistics summarized patient characteristics and findings. Associations between categorical variables were assessed using the Chi-square test. Statistical significance was considered at a $P<.05$ and 95% confidence intervals. For the purpose of this study, hematochezia was defined as the passage of bright red blood per rectum, usually mixed with or coating stool, indicating lower gastrointestinal bleeding. Fresh blood referred to visible bright red blood not necessarily mixed with stool, often observed separately during or after defecation. Descriptive statistics were used to summarize patient characteristics. Frequencies and percentages were calculated for categorical variables. Associations between variables were assessed using the Chi-square test. Data were collected using a structured data extraction sheet developed based on the study objectives and variables of interest. The data extraction tool was pretested on a small number of patient records before the actual data collection to ensure completeness, clarity, and consistency of collected information. Necessary modifications were made before final data collection. Pathological findings were obtained from colonoscopy reports and available histopathology reports in patient records. Colonoscopies were performed by trained endoscopists at the Endoscopy Unit of Bugando Medical Centre. Where lesions suspicious for malignancy or other pathological conditions were identified, biopsies were obtained during the procedure according to clinical indication. Tissue samples were processed and examined by qualified pathologists in the pathology department, and final histopathological diagnoses were recorded in the patient files.

Ethical Approval

Ethical approval was sought from the Joint Ethics and Research Review Committee of the Catholic University of Health and Allied Sciences Bugando Medical Centre before commencement of the study. which was numbered 3266/2024 Permission to access medical records was obtained from the relevant hospital authorities.

RESULTS

Demographic Characteristics

The total number of participants were 327 and 170/327(52%) were male and 157/327(48%) were female. The median age was 52 years (range: 4 to 91 years). Most patients (41.9%) were aged 46 years and above, followed by 30% aged 18–35 years, and 28.1% aged 36 to 45 years. (Table 1)

Presentation of the Illness

Among the patients, passage of stool mixed with blood was observed in 268 (82.0%) patients, while 59 (18.0%) did not present with this symptom. Of those with blood in their stool, 151 (46.2%) had hematochezia, 89 (27.2%) had fresh blood, and 28 (8.6%) had occult bleeding. The bleeding was acute in 131 (40.1%) patients and chronic in 137 (59.9%) (Table 2).

TABLE 1: Demographic Characteristics

Variable/Responses	Frequency (N)	Percentage (%)
Sex		
Male	170	52.0
Female	157	48.0
Age in Years		
Median (IQR)	52 (4-91)	
18-35	98	30
36-45	92	28.1
46 and above	137	41.9

TABLE 2: Presentation of the Illness

Variable/Responses	Frequency (N)	Percentage (%)
Confirmed Stool Mixed with Blood		
Yes	268	82.0
No	59	18.0
Type of Bleeding		
Hematochezia	151	46.2
Fresh Blood	89	27.2
Occult Bleeding	28	8.6
Duration of Bleeding		
Acute	131	40.1
Chronic	137	59.9

Medical and Clinical History

Among the participants, hypertension was the most prevalent comorbidity, affecting 50 (15.3%) patients, followed by diabetes mellitus in 21 (6.4%) and cardiovascular disease in 7 (2.1%). Additionally, 4 (1.2%) patients had diabetes with other diseases, and 2 (0.6%) had chronic kidney disease. Prior hospital admissions for gastrointestinal (GI) issues were noted in 121 (37.0%) patients, while 206 (63.0%) had no such history. Similarly, 121 (37.0%) patients had undergone prior surgery for GI issues (Table 3).

Prevalence of Lower Gastrointestinal Bleeding

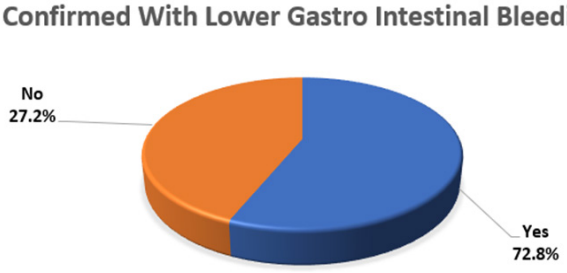
Figure 1 illustrates the prevalence of lower gastrointestinal bleeding (LGIB) among patients who underwent colonoscopy at Bugando Medical Centre. Out of the 327 patients included in the study, 238 (72.8%) were diagnosed and confirmed to have LGIB. Among these, 147 (61.8%) were female, while 91 (38.2%) were male. Additionally, nearly all patients with hypertension had LGIB, with 47 out of 50 (94.0%) being diagnosed with the condition. Conversely, 89 (27.2%) patients did not have LGIB.

The pathological findings among these patients revealed a diverse range of conditions as indicated in Figure 2. Hemorrhoids and related conditions were the most prevalent, affecting 45 patients (14.2%). Ulcerative colitis and its various subtypes were observed in 17 patients (5.4%). Malignant neoplasm of the colon was found in 20 patients (6.3%), making it another significant condition. Additionally, irritable bowel syndrome (IBS) was reported in 6 patients (1.9%), while Malignant neoplasm of the rectum and Anus was observed in 5 patients (1.6%). Rectal polyps and polyps of the colon were found in 10 patients (3.1%), and gastrointestinal hemorrhage (unspecified) was reported in 5 patients (1.6%).

TABLE 3: Medical and Clinical History

Variable/Responses	Frequency (N)	Percentage (%)
Hypertension		
Yes	50	15.3
No	277	84.7
Diabetes Mellitus		
Yes	21	6.4
No	306	93.6
Diabetes with Other Diseases		
Yes	4	1.2
No	323	98.8
Cardiovascular Disease		
Yes	7	2.1
No	320	97.9
Chronic Kidney Disease		
Yes	2	0.6
No	325	99.4
Prior Hospital Admissions for GI Issues		
Yes	121	37.0
No	206	63.0
Prior Surgery for GI Issues		
Yes	121	37.0
No	206	63.0

FIGURE 1: Prevalence of Lower Gastrointestinal Bleeding



Factors Associated with Lower Gastrointestinal Bleeding

Cross-sectional analysis was done to assess the factors associated with lower gastrointestinal bleeding (LGIB) among patients who underwent colonoscopy at Bugando Medical Centre (Table 4). The analysis revealed that sex was significantly associated with LGIB, with 93.6% of females having the condition compared to 53.5% of males (P=.004). Similarly, hypertension showed a strong association with LGIB, as nearly all hypertensive patients (94.0%) were diagnosed with the condition (P<.001). Moreover, prior surgery for gastrointestinal

(GI) issues was found to be statistically significant, with 81.8% of patients who had undergone prior GI surgery developing LGIB compared to 67.5% of those without prior GI surgery (P=.03). Other factors such as diabetes, cardiovascular disease, and prior hospital admissions for GI issues were not significantly associated with LGIB (P>.05). Age group was also not statistically significant, though patients aged 36 years and above had a higher prevalence of LGIB. These findings suggest that female sex, hypertension, and prior GI surgery may be important risk factors for LGIB in this population.

FIGURE 2: Pathological Findings Associated with Lower Gastrointestinal Bleeding

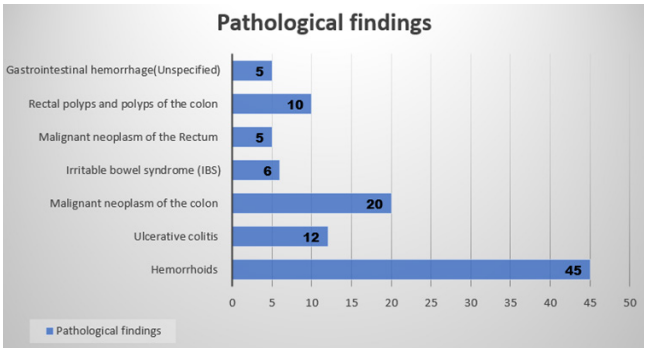


TABLE 4: Factors Associated with Lower Gastrointestinal Bleeding (LGIB)

Variable/Response	LGIB YES (N = 238)	LGIB NO (N = 89)	Total (N = 327)	Chi-square (χ^2) Value	df	*P Value*
Sex						
Male	91 (53.5%)	79 (46.5%)	170	8.12	1	.004**
Female	147 (93.6%)	10 (6.4%)	157			
Age Group (years)						
1-17	15 (57.7%)	11 (42.3%)	26	5.68	2	.058
18-35	59 (71.1%)	24 (28.9%)	83			
36-45	58 (75.3%)	19 (24.7%)	77			
46 and above	106 (75.2%)	35 (24.8%)	141			
Hypertension						
Yes	47 (94.0%)	3 (6.0%)	50	15.24	1	< .001**
No	191 (69.5%)	86 (30.5%)	277			
Diabetes Mellitus						
Yes	19 (73.1%)	7 (26.9%)	26	0.08	1	.78
No	219 (72.7%)	82 (27.3%)	301			
Cardiovascular Disease						
Yes	6 (85.7%)	1 (14.3%)	7	0.92	1	.33
No	232 (72.3%)	88 (27.7%)	320			
Prior Surgery for GI Issues						
Yes	99 (81.8%)	22 (18.2%)	121	4.62	1	.03*
No	139 (67.5%)	67 (32.5%)	206			
Prior Hospital Admissions for GI Issues						
Yes	89 (75.4%)	29 (24.6%)	118	0.78	1	.38
No	149 (71.3%)	60 (28.7%)	209			

DISCUSSION

Demographics, Clinical Patterns, and Prevalence of Lower Gastrointestinal Bleeding

This study aimed to determine the prevalence and pathological findings among patients presenting with lower gastrointestinal bleeding at the Endoscopy Unit of Bugando Medical Centre. This study found a 72.8% prevalence of lower gastrointestinal bleeding (LGIB) among patients undergoing colonoscopy at Bugando Medical Centre. This relatively high prevalence aligns with findings from other tertiary institutions. For example, A reported up to 70% prevalence in elderly populations with comorbidities.[17] Similarly, in Kenya and Kilimanjaro Christian Medical Centre reported LGIB prevalence rates of 65.5% and 62.8% respectively. [18,19] These similarities likely stem from the referral nature of tertiary centers, which manage more complex and severe GI cases.

Contrasting studies have reported lower prevalence rates. In a global review, documented LGIB prevalence ranging from 50–60 %.[20] In African contexts, a study in Nigeria

reported 55.8%, and a study in Muhimbili National Hospital in Tanzania found a prevalence of 57%.[21,22] Lower rates were also reported in Ethiopia and Dodoma, Tanzania. [23,24] These disparities may reflect differences in access to endoscopy services, diagnostic practices, and referral patterns. Notably, lower prevalence in primary and regional centers may be due to underdiagnosis or milder disease cases being managed without colonoscopy.

Conversely, higher LGIB prevalence has been observed elsewhere. Studies from Zambia (Lusaka University Teaching Hospital), Uganda (Nsubuga) and Zimbabwe (Harare Central Hospital) reported prevalence rates of 78.5%, 80.2%, and 83% respectively. [25, 26] These elevated rates may be attributed to late presentation, limited early diagnostic resources, and a high burden of colorectal malignancies and inflammatory bowel diseases in these populations.

These variations underscore the impact of healthcare infrastructure, diagnostic availability, and patient referral behavior on LGIB prevalence. The higher prevalence observed at Bugando may suggest delayed presentation and increased disease severity, highlighting the urgent need for early screening programs and enhanced community awareness to enable timely diagnosis and intervention. A notable finding in this study was the substantial proportion of patients diagnosed with colorectal malignancy among those presenting with lower gastrointestinal bleeding. This highlights the importance of timely colonoscopic evaluation in symptomatic patients, as bleeding may represent an early warning symptom of colorectal cancer. However, the current study could not determine disease stage at diagnosis due to limited documentation of staging information.

It is important to note that this study was conducted in a tertiary referral hospital and therefore reflects the burden of disease among patients requiring colonoscopy rather than the general population. While this limits generalizability, the findings provide valuable insights into disease patterns, diagnostic yield, and resource needs in similar hospital settings.

Association with Demographic and Clinical Factors

Sex, hypertension, and history of gastrointestinal surgery showed significant associations with LGIB in this study. Notably, 93.6% of female patients were diagnosed with LGIB compared to 53.5% of males (P=.004). While the reason for this disparity remains speculative, potential contributors include hormonal influences, dietary factors, and healthcare-seeking behavior among women.

Hypertension was strongly associated with LGIB (94.0% prevalence among hypertensives, P<.001). This supports findings from Strate, which link hypertension to increased vascular fragility and a predisposition to mucosal bleeding. Furthermore, a history of gastrointestinal surgery was significantly associated with LGIB (P=.03), possibly due to altered mucosal integrity or chronic postoperative changes predisposing to bleeding findings that mirror observations.[27, 28]

Interestingly, age, diabetes, cardiovascular disease, and prior hospitalizations did not show statistically significant associations with LGIB. While a trend of increased LGIB with advancing age was noted, it was not statistically significant in this cohort. This contrasts with global literature that often cites age as a major risk factor, suggesting that population-specific factors or study design differences may influence risk stratification.

Although hemorrhoids were the most common pathological finding, colonoscopy remains an essential diagnostic tool to exclude serious conditions such as colorectal cancer, particularly in older patients or those with risk factors. However, in selected low-risk patients presenting with typical symptoms of hemorrhoids, initial clinical evaluation may reduce unnecessary colonoscopy, thereby saving time and healthcare resources.

Although not assessed in this study, the use of non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids has been associated with gastrointestinal bleeding in other studies. Future research should explore medication-related risk factors in this population.

Additionally, emerging evidence suggests a potential role of infectious and autoimmune conditions, including prior SARS-CoV-2 infection and inflammatory bowel diseases, in gastrointestinal bleeding. These factors were not assessed in this study and represent important areas for future research.

Pathological Correlations

Hemorrhoids, malignant neoplasm of the colon, and ulcerative colitis were strongly correlated with LGIB, echoing findings from a 2023 systematic review, the diagnostic patterns observed in this study align with similar reports from Ghana and Tanzania, underscoring a consistent trend of pathological drivers of LGIB across sub-Saharan Africa.[28, 29, 30] These findings suggest that diagnostic algorithms and treatment protocols should prioritize screening for these conditions among patients presenting with LGIB symptoms.

Furthermore, the significant association between prior gastrointestinal surgery and LGIB suggests the need for structured follow-up programs in post-surgical patients, as chronic mucosal changes may predispose them to recurrent bleeding. Although colonoscopy is also an important screening tool for colorectal cancer and other colorectal diseases among asymptomatic individuals, this study focused on patients presenting with symptoms suggestive of lower gastrointestinal bleeding who underwent colonoscopic evaluation.

Study Strengths and Limitations

This study has several limitations. First, it was a retrospective hospital-based study, which limits the generalizability of the findings to the wider community. Second, reliance on medical records introduced the possibility of missing or incomplete data, which may have affected the accuracy of some variables. Third, important factors such as medication use (e.g., NSAIDs, steroids), lifestyle behaviors, and prior infections were not consistently documented and therefore could not be analyzed. Additionally, detailed histopathological findings and endoscopic images were not available for all patients. Despite these limitations, the study provides valuable insights into the burden and patterns of LGIB in a tertiary care setting. Among patients who underwent colonoscopy

for suspected lower gastrointestinal bleeding, pathological findings were identified in 72.8% of cases. However, approximately 27.2% had no identifiable pathological lesion on colonoscopy. This may reflect intermittent bleeding, missed lesions, non-colonic sources of bleeding, or limitations related to retrospective record review.

CONCLUSION

This study demonstrates a high burden of lower gastrointestinal bleeding among patients undergoing colonoscopy at Bugando Medical Centre. Female sex, hypertension, and prior gastrointestinal surgery were significantly associated with LGIB. Hemorrhoids, colorectal malignancies, and inflammatory conditions were the most common underlying causes. These findings highlight the importance of timely diagnostic evaluation, appropriate patient selection for colonoscopy, and structured follow-up in high-risk groups. Future research should explore additional risk factors, including medication use, infections, and autoimmune conditions, to further improve prevention and management strategies. Based on these findings, healthcare providers should strengthen early evaluation of patients presenting with lower gastrointestinal bleeding. Further studies involving multiple centers are recommended to improve understanding of the burden and causes of lower gastrointestinal bleeding.

Recommendations

- To the Ministry of Health and policymakers: Strengthen healthcare policies that promote early detection and preventive screening for lower gastrointestinal bleeding (LGIB), including the implementation of targeted colorectal cancer screening programs for high-risk populations.

- To hospital administrators and healthcare facilities: Improve diagnostic capacity by expanding access to colonoscopy services, standardizing diagnostic protocols, and ensuring the availability of appropriate equipment and trained personnel for timely diagnosis and management of LGIB.

- To healthcare providers: Enhance clinical evaluation strategies to facilitate early identification of patients requiring colonoscopy, with particular attention to individuals at higher risk, including those with hypertension and a history of gastrointestinal surgery. Healthcare providers should also adopt sex-specific risk assessment approaches and receive continuous training in the recognition and management of common LGIB-associated conditions such as hemorrhoids, colorectal malignancies, and ulcerative colitis.

- To public health practitioners: Develop and implement health education campaigns to increase public awareness of the signs and symptoms of LGIB and promote early healthcare-seeking behavior. Public health interventions should also encourage healthy lifestyles by addressing modifiable risk factors such as smoking and obesity.

- To researchers: Conduct prospective, multicenter, and longitudinal studies to further investigate the mechanisms linking LGIB with associated risk factors and pathological findings. Future research should also evaluate intervention outcomes, patient experiences, and disease progression, while including diverse populations across Tanzania to improve the generalizability of the findings.

REFERENCES

1. Saydam ŞS, Molnar M, Vora P. The global epidemiology of upper and lower gastrointestinal bleeding in general population: A systematic review. World J Gastrointest Surg. 2023;15(4):723–39.
2. Amin SK, Antunes C. Lower Gastrointestinal Bleeding. [Updated 2021 Jul 19]. StatPearls [Internet] Treasure Isl StatPearls Publ. 2021;
3. Davies G, Black C, Fairbrass K. Gastrointestinal disease. In: Medicine for Finals and Beyond. CRC Press; 2022. p. 359–428.
4. Hong SM, Baek DH. A Review of colonoscopy in intestinal diseases. Diagnostics. 2023;13(7):1262.
5. Imran H, Alexander JT, Jackson CD. Lower Gastrointestinal Hemorrhage. JAMA [Internet]. 2024;331(19):1666–7. Available from: https://doi.org/10.1001/jama.2023.25841
6. Khan F, Dareka KM, Qing Z, Ping TX, Pokhrel SM, Vaidya R. Prevalence and Cause of Lower Gastrointestinal Bleeding in Adults. Int J Sci Invent today. 2018;7(4):799–813.
7. Kouanda AM, Somsouk M, Sewell JL, Day LW. Urgent colonoscopy in patients with lower GI bleeding: a systematic review and meta-analysis. Gastrointest Endosc. 2017;86(1):107–17.
8. Mosli M, Aldabbagh A, Aseeri H, et al. The diagnostic yield of urgent colonoscopy in acute lower gastrointestinal bleeding. Acta Gastroenterol Belg. 2020;83(2):265–70.
9. Herman AM, Hawkins AT, Misso K, et al. Colorectal Cancer in Northern Tanzania: Increasing Trends and Late Presentation Present Major Challenges. JCO Glob Oncol. 2020 Mar;6:375–81.
10. Kisuule I, Seremba E, Kagimu M. Prevalence of gastrointestinal bleeding and frequency of selected predictors of mortality on the medical emergency ward at Mulago hospital. Afr Health Sci. 2023 Mar;23(1):622–30.
11. Sibomana I, Karenzi ID, Niyongombwa I, Dusabejambo V, Kiswezi A. Lower gastrointestinal bleeding at a referral hospital in Kigali, Rwanda: Clinical, colonoscopic and pathologic profiles. East Cent African J Surg. 2019;24(2):101–4.
12. Werner DJ, Manner H, Nguyen-Tat M, et al. Endoscopic and angiographic management of lower gastrointestinal bleeding: Review of the published literature. United Eur Gastroenterol J. 2018;6(3):337–42.
13. Marion Y, Lebreton G, Le Pennec V, Hourna E, Viennot S, Alves A. The management of lower gastrointestinal bleeding. J Visc Surg. 2014;151(3):191–201.
14. Waddingham W, Kamran U, Kumar B, Trudgill NJ, Tsiamoulos ZP, Banks M. Complications of colonoscopy: common and rare recognition, assessment and management. BMJ Open Gastroenterol [Internet]. 2023;10(1). Available from: https://bmjopengastro.bmj.com/content/10/1/e001193

15. Roshan Afshar I, Sadr MS, Strate LL, Martel M, Menard C, Barkun AN. The role of early colonoscopy in patients presenting with acute lower gastrointestinal bleeding: a systematic review and meta-analysis. Therap Adv Gastroenterol. 2018;11:1756283X18757184.

16. Ghassemi KA, Jensen DM. Lower GI bleeding: epidemiology and management. Curr Gastroenterol Rep. 2013 Jul;15(7):333.

17. Peery, A. F., Crockett, S. D., Murphy, C. C. et al. Burden and cost of gastrointestinal, liver, and pancreatic diseases in the United States: Update 2018. Gastroenterology, 159(1), 395–417.e21. Gastroenterology. 2019 May;156(6):1936. doi: 10.1053/j.gastro.2019.03.024. Epub 2019 Mar 25.PMID: 30923001

18. Mwangi, M., Maina, D., & Mwachiro, M. Prevalence and causes of lower gastrointestinal bleeding in patients undergoing colonoscopy at a tertiary hospital in Kenya. East African Medical Journal, 2021; 98(2), 65–70.

19. Kilimanjaro Christian Medical Centre. (2022). Annual Clinical Report: Colonoscopy Services and Outcomes. Internal publication.

20. Ghassemi, K. A., Jensen, D. M. Lower gastrointestinal bleeding: Epidemiology and management. Gastroenterology Clinics of North America, 2019; 48(3), 401–415.

21. Ajayi, E. A., Oyediran, M. A., & Alabi, T. O. Pattern and outcome of colonoscopic findings among patients with lower GI bleeding in Nigeria. Nigerian Journal of Gastroenterology and Hepatology, 2020; 12(1), 33–39.

22. Muhimbili National Hospital. (2020).Colonoscopy service audit report 2019–2020. Department of Internal Medicine.

23. Taye, B., Mekonnen, D., & Gebremichael, B. Colonoscopy findings and clinical correlation at a tertiary hospital in Ethiopia. Ethiopian Medical Journal, 2020; 58(3), 195–202.

24. Dodoma Regional Referral Hospital. (2019). Gastrointestinal Endoscopy Annual Review Report.

25. Lusaka University Teaching Hospital. Prevalence and causes of lower GI bleeding in Zambian adults: A retrospective review. Zambian Medical Journal, 2023 40(1), 21–27.

26. Nsubuga, M., Tumwine, J. K., & Lubega, S. Patterns of colonoscopy findings in lower GI bleeding at a Ugandan referral hospital. African Health Sciences, 2023; 23(2), 112–119.

27. Strate, L. L., Gralnek, I. M. ACG Clinical Guideline: Management of patients with acute lower gastrointestinal bleeding. American Journal of Gastroenterology, 2016; 111(4), 459–474.

28. Amoako Duah, A., Acheampong, I., & Ofori-Asenso, R. Clinical characteristics and colonoscopic findings in Ghanaian patients with lower GI bleeding. Pan African Medical Journal, 2020; 37, 112.

29. Saydam ŞS, Molnar M, Vora P. The global epidemiology of upper and lower gastrointestinal bleeding in general population: A systematic review. World J Gastrointest Surg. 2023 Apr;15(4):723–39.

30. Shaffin S. Rajan, S., Chalya, P. L., & Mabula, J. B. Colonoscopy findings in patients with lower GI bleeding at Bugando Medical Centre, Tanzania. Tanzania Medical Journal, 2019; 34(2), 73–78.

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