Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/1gpmh303

CAUSES AND OUTCOME OF CHILDREN WITH LOWER GASTROINTESTINAL BLEEDING (LGIB) PRESENTING AT TERTIARY CARE HOSPITAL

Dr Misbah Ullah Khan[1], Dr Ruba Gul[2], Dr Sadiq Akbar[3]*, Dr Noor Ul Haram Khattak[4], Dr Tanzeela[5], Dr Zia Muhammad[6]

[1]Experiential Registrar Department of Child Health Khyber Teaching Hospital Peshawar, Pakistan,
Email: dr.misbahullah13@gmail.com
[2]Resident Pediatrics, Khyber Teaching Hospital Peshawar, Pakistan,
Email: rubagul677@gmail.com
[3]*Resident Pediatrics Khyber Teaching Hospital Peshawar, Pakistan,
Email: sadiqakbar77@yahoo.com
[4]Resident Pediatrics, Khyber Teaching Hospital Peshawar, Pakistan,
Email: noorulharamkhattak@yahoo.com
[5]Resident Pediatrics, Khyber Teaching Hospital Peshawar, Pakistan,
Email: aleph2728@gmail.com
[6]Associate Professor, Department of Child Health, Khyber Teaching Hospital Peshawar, Pakistan,
Email: drziamuhammad@gmail.com

***Corresponding author:** Dr Sadiq Akbar
*Email: sadiqakbar77@yahoo.com

Abstract

Introduction: Lower gastrointestinal bleeding (LGIB) in children is a concerning clinical presentation with a diverse range of underlying causes. Prompt diagnosis is essential to guide effective management and improve outcomes.

Objective: To identify the causes and assess the clinical outcomes of children presenting with LGIB at a tertiary care hospital in Pakistan.

Materials and Method: This was a descriptive cross-sectional study carried out at Khyber Teaching Hospital Peshawar, Pakistan in the duration from February 2024 and July 2024. The study involved the assessment of 300 pediatric patients with LGIB that was conducted with the help of clinical examination and colonoscopy, imaging studies, and histopathology.

Findings: The most frequent cause was juvenile polyps (32%), followed by non-specific colitis (20.7), SRUS (10.3), and IBD (10 percent). The diagnostic yield of colonoscopy was high (93.3%), and the majority of the patients responded favorably either to conservative or endoscopic therapy. In 10 percent of the cases, surgery was expected.

Conclusion: Early colonoscopic evaluation is crucial for timely diagnosis and management of pediatric LGIB.

Keywords: Lower gastrointestinal bleeding, children, colonoscopy, juvenile polyps, inflammatory bowel disease, Pakistan.

INTRODUCTION

The condition of lower gastrointestinal bleeding (LGIB) in children is one of the key and unpleasant clinical manifestations, which sometimes requires emergency treatment and diagnostic investigation. It includes bleeding distal to the ligament of Treitz, which usually involves the colon, rectum, and anus. Despite having a lower prevalence than upper gastrointestinal bleeding, LGIB is a potentially severe disease with a wide variety of different underlying causes, and it should be identified and treated properly (1). The clinical manifestations of LGIB in children may range from mild intermittent bleeding to severe hemorrhage, which creates diagnostic and therapeutic dilemmas. Awareness of the nature of the range of etiologies and corresponding outcomes is crucial when steering toward an effective investigation process and management intercession. There has been increasing documentation that has emphasized finding the common causes and clinical effects of pediatric LGIB, and this has played an important role in enhancing care and outcomes in cases of these common causes.

Research on colonoscopy as an essential diagnostic method of assessing pediatric LGIB has gained currency in recent times. Colonoscopy is not merely safe. It also has very great diagnostic value when done when the doctor has a lot of experience. The study conducted by Irtaza et al. revealed that colonoscopies resulted in conclusive diagnoses of a high percentage of children with LGIB who had inflammatory, infectious, and anatomical causes referred to in a large tertiary endoscopy center (1). Likewise, the findings of a tertiary care facility in Bahrain revealed that the use of endoscopic assessment played a significant role in highlighting the underlying pathology, whereas juvenile polyps and inflammatory bowel disease (IBD) were some of the most frequently observed conditions (2). These results correlate with the reports in other areas like Kashmir, where Malik et al. had observed polyps, infections, and Meckel diverticulum as the major causes of LGIB in a five-year study (3).

Clinical management of LGIB varies depending on the resources and diagnostic modalities available in the region. Clinical scoring tools like the Sheffield score have also been used in resource-limited settings as an effective method of triaging, often resulting in endoscopic intervention (4). Colonoscopy and endoscopic procedures are the mainstay of diagnostic testing. Alrashidi et al. not only emphasized the disease patterns in Saudi children with LGIB undergoing colonoscopy but also made a significant diagnostic opportunity, which once again adds validity to the application of colonoscopy in such scenarios (5). The regional disease pattern is important, as it helps identify and control certain illnesses within a population group at their early stages.

The team founded on the significance of a systematic diagnostic process of pediatric LGIB and stressed the likely combination of clinical history, physical assessment, and wise application of endoscopic procedures (6). Although clinical manifestations of abdominal pain, rectal bleeding, and changes in bowel habits are popular, they are not specific, so systematic diagnostic processing is required. The cause was variable in many ways, with Joshi and Singh also observing infections, polyps, and IBD as underlying causes (7). These differences point to the significance of institutional procedures and guidelines that are matched to local epidemiology and diagnostic capability.

A number of studies have strengthened the convenience of colonoscopy in the diagnosis and treatment of LGIB. To illustrate, Soni noted that the colonoscopy was central in the diagnosis of matters concerning colitis to polyps in a tertiary care facility (8). The prevalence of upper gastrointestinal bleeding differs among various populations, but the knowledge of the overlap and differences between upper and lower gastrointestinal bleeding can be used to narrow down the techniques of diagnosis. Almadi et al. covered patient outcomes in upper GI bleeding and delivered information that touches upon the systemic manifestations of gastrointestinal hemorrhage, which can also pertain to lower GI origins (9). As presented in a study conducted in Northern India, targeted colonoscopy in LGIB has proven to be not only diagnostically but also therapeutically useful in situations that include polyps (10).

Strategies to manage them, such as blood transfusion thresholds, are also investigated. Kola et al. compared restrictions and liberal approaches to transfusion, and it revealed that restrictive transfusion strategies could be applied to gastrointestinal bleeding cases safely without the implication of patient outcomes (11). This can be potentially applied to the management of pediatric LGIB as long as

patient-specific factors are well taken into account. In solitary rectal ulcer syndrome (SRUS), Ejaz et al. noted that it could be considered a significant cause of LGIB among children, and histopathological confirmation should be essential in unusual cases (12). The transfer and referral practices also influence the outcomes of the patients. The study by Jaan et al., conducted only lately, has found that the transfer of LGIB patients between hospitals is characterized by delays in care and possible exacerbations, which indicates that fast and accurate diagnosis and intervention can be of great help in ensuring better outcomes (13).

In India, Kumar et al. described a clinical profile of children with LGIB, noting that early determination of the cause was critical in the successful management (14). Other systemic variables, including renal dysfunction, have been demonstrated to exert negative effects on GI bleeding, as was evident in a large cohort study undertaken by Simon et al., thereby raising the importance of a multisystem approach in the management of such patients (15)(16). Reviewing the problems of gastrointestinal bleeding management in older age, Menichelli et al. included the issue of anticoagulation, which, despite being more applicable to adults, reflects the complexity of the phenomena (17). IBD is a major cause of childhood LGIB in some parts of the world, as described by Khan et al., where they document the occurrence of the condition in children who undergo colonoscopy in a hospital setting in Pakistan (18)(19). Lastly, Shah and Hata reported a pervasive instance of Henoch-Schonlein purpura with LGIB, proving that despite being uncommon, systemic vasculitides should be regarded in the assortment of equations (20).

Objective: To identify the underlying causes and assess the clinical outcomes of children presenting with lower gastrointestinal bleeding at a tertiary care hospital in Pakistan over a six-month study period.

MATERIALS AND METHODS

Design: Descriptive Cross-sectional Study.

Study setting: The study was conducted at the Khyber Teaching Hospital Peshawar, Pakistan.

Duration: The study was conducted over a period of six months, from February 2024 to July 2024.

Inclusion Criteria: Children aged 1 month-16years who presented with indications of lower gastrointestinal bleeding such as hematochezia and bloody stools as well as rectal hemorrhage were also incorporated into the study. They were only enrolled with patients who underwent diagnostic assessment e.g. colonoscopy, imaging, or histopathology when they were in the hospital. Parents or guardians signed their consent to inclusion.

Exclusion Criteria: Children who had upper gastrointestinal bleeding confirmed upon endoscopy, children whose bleeding was caused by anal fissure alone, bleeding disorders or whose medical records were incomplete, were excluded in the study.

Methods

All the children who were within the inclusion criteria were enrolled sequentially throughout the study period. Epidemiological and historical data were also collected, such as duration, frequency, and nature of bleeding, concomitant symptoms that accompanied bleeding like abdominal pain, diarrhea, weight loss or fever, and any past episodes of gastrointestinal bleeding. The clinical review concentrated on general status, pallor, abdominal appearance and anus. General laboratory examinations were performed: complete blood count, coagulation profile, stool examination, and inflammatory indicators as needed. Most of the colonoscopy was done under sedation with a skilled pediatric gastroenterologist aimed at locating the origin of the bleeding. Histopathological confirmation was effected by taking biopsies where necessary. In some patients, abdominal ultrasound or Meckel scanning was performed. Clinical, endoscopic, histological, and radiological findings were used in the final diagnosis. Endoscopic intervention or surgery, the plan of medical treatment, or a combination of medical and nursing PICC care was recorded. Resume management results were measured according to the resolution of bleeding, recurrence, hospital stay, and complications.

RESULTS

The study involved 300 children who experienced lower gastrointestinal bleeding (LGIB). The average age was 7.2 +/-3.5 years, and there was a female neutral bias (male-to-female ratio 1, 3:1). Fresh rectal bleeding (78 percent of the patients), abdominal pain (52 percent), diarrhea (33 percent) and constipation (21 percent) were the most frequently observed presenting symptoms. The symptoms lasted 1 day and a few weeks, depending on the duration.

Table 1: Demographic and Clinical Characteristics of Patients (n = 300)

Variable	Frequency (%)
Age Group	
<1 year	18 (6.0%)
1–5 years	90 (30.0%)
6–10 years	112 (37.3%)
11–16 years	80 (26.7%)
Gender	
Male	170 (56.7%)
Female	130 (43.3%)
Symptoms	
Fresh rectal bleeding	234 (78.0%)
Abdominal pain	156 (52.0%)
Diarrhea	99 (33.0%)
Constipation	63 (21.0%)

The colonoscopy was done on 270 patients (90%), and a specific cause of LGIB was found in 252 patients (93.3% of those scoped). The most common pathological finding was juvenile polyps with 96 paths (32%), then non-specific colitis, solitary sigmoid ulcer syndrome, and inflammatory bowel disease (IBD), such as ulcerative colitis and Crohn's disease, that were recorded in 10 percent of the patients, respectively.

Table 2: Colonoscopic Findings (n = 270)

Finding	Frequency (%)
Juvenile polyp(s)	96 (35.6%)
Non-specific colitis	56 (20.7%)
Solitary rectal ulcer syndrome	28 (10.3%)
Ulcerative colitis	18 (6.7%)
Crohn’s disease	9 (3.3%)
Meckel’s diverticulum (via scan)	12 (4.4%)
Normal findings	23 (8.5%)
Others (e.g., infections)	28 (10.3%)

Technetium-99m pertechnetate imaging was utilized in a smaller group of suspected Meckel diverticulum - bearing patients and the patient was proven to have it in 12 cases. In majority of cases, histopathology substantiated the colonoscopic diagnoses, particularly in polyps, IBD, SRUS. Among the patients, thirty (10%) underwent surgical treatment, predominantly on the reasons of Meckel diverticulum and unstopped bleeding polyps.

Table 3: Management Approach (n = 300)

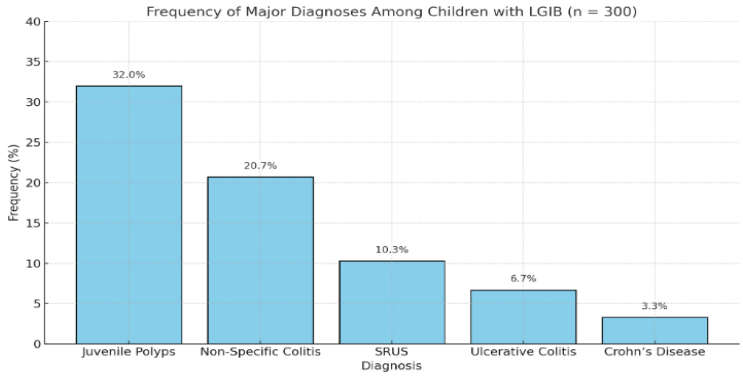
Treatment Modality	Frequency (%)
Conservative (medications only)	198 (66.0%)
Colonoscopic polypectomy	54 (18.0%)
Surgical intervention	30 (10.0%)
No intervention (mild, self-limiting)	18 (6.0%)

Most patients (92%) had complete resolution of bleeding with appropriate treatment. Recurrence of symptoms occurred in 24 patients (8%), predominantly in those with IBD or SRUS. The mean duration of hospital stay was 4.8 ± 2.1 days.

Table 4: Outcomes and Follow-Up (n = 300)

Outcome	Frequency (%)
Bleeding resolved (no recurrence)	276 (92.0%)
Recurrent bleeding	24 (8.0%)
Hospital stay > 7 days	45 (15.0%)
Required long-term follow-up	39 (13.0%)
Complications (minor)	12 (4.0%)

Graph 1: Frequency of Major Diagnoses Among Children with LGIB (n = 300)



A bar graph showing five major diagnoses: Juvenile Polyps (32%), Non-Specific Colitis (20.7%), SRUS (10.3%), Ulcerative Colitis (6.7%), and Crohn's Disease (3.3%).

The majority of LGIB cases in this cohort were managed successfully with conservative or endoscopic approaches. Early colonoscopic evaluation led to accurate diagnosis and timely intervention in most patients, contributing to favorable outcomes and reduced recurrence.

DISCUSSION

The problem of lower gastrointestinal bleeding (LGIB) in children needs attention because of the wide range of possible forms of etiology and the potential severity of clinical manifestations it may require. In this study, information was evaluated about the etiology and the outcome of LGIB in children who came to a tertiary care hospital in Pakistan, which adds to the existing literature as pertinent regional data. As found our findings revealed that juvenile polyps were the overwhelming etiology of LGIB that was followed by non-specific colitis, solitary rectal ulcer syndrome (SRUS), and inflammatory bowel disease (IBD), consistent trends with local and international studies. Colonoscopy was shown to be a very useful diagnostic method with a recognizable pathology found in more than 93 percent of the children used in the procedure. Irtaza et al. also inferred the safety and the diagnostic yield of

colonoscopy in children with LGIB, with them reporting that juvenile polyps and mucosal inflammation were among the most commonly seen after the procedure (1).

The significance of colonoscopy was also stressed by Isa et al. in their research carried out in Bahrain, where the endoscopic assessment led to juvenile polyps and IBD being the most significant causes of LGIB among children (2). The findings support the international validity of colonoscopy as the reference in the diagnosis of LGIB in children, particularly in a tertiary center. The level of juvenile polyps that affects almost 1 / 3 of the patients in our research is consistent with that of Malik et al., who found that polyps constituted the most common cause of LGIB in a 5-year retrospective study carried out in Kashmir (3). Doctors normally treat juvenile polyps, and mostly, they appear without pain in the rectum, which causes bleeding. They are mostly isolated and are found on the rectosigmoid colon and thus can be easily removed by colonoscopic polypectomy. Most of these polyps could be removed endoscopically in our study, thus yielding an excellent outcome in terms of recurrence.

Non-specific colitis was also considered another strong contributor to LGIB among our population. Similar data were recorded in a resource-poor environment by Adeniyi et al., where most patients were diagnosed with infectious or non-specific colitis on the basis of endoscopy and biopsy (4). This implies that endoscopy may offer information that is helpful even in an environment where few diagnostic facilities are available to offer information that will direct clinical decision-making. Further, the prevalence of non-specific colitis was among the most dominant findings in a study carried out by Alrashidi et al. on Saudi Arabian children who undertook colonoscopy due to LGIB (5). Our patients also had a significant percentage of SRUS. As explained by Jamer et al., it is difficult to diagnose because it has clinical similarities with IBD and requires to be confirmed histologically (6).

SRUS is usually accompanied by straining, bleeding, and a feeling of incomplete emptying and frequently needs behavioral and nutritional interventions in addition to topical treatment. Recognition should not be delayed because it may result in chronic symptoms and erroneous diagnosis. Diseases such as inflammatory bowel disease, including both ulcerative colitis and Crohn's disease, contributed to about 10 percent of our cases. According to Joshi and Singh, the prevalence of pediatric IBD is growing in developing areas, which may be a result of increased recognition and progress of diagnostic tools (7). In the same manner, the research performed under Soni revealed that the diagnosis of IBD was increasing, particularly among children who had periodic or extreme LGIB (8). It is important to diagnose IBD and start the process of medical management promptly to prevent complications, shorten the time of stay in the hospital, and increase the quality of life.

The overlap of upper gastrointestinal bleeding (UGIB) and LGIB is important to consider because the former has long been considered a serious condition associated with pronounced hemodynamic overload. Almadi et al. have noted that it is important that UGIB is distinguished from LGIB, especially in massive bleeding, when nasogastric lavage and upper endoscopy can be required to exclude upper origins (9). A single-center study of Malik conducted in Kashmir also confirmed that colonoscopy is safe and informative in children with unknown sources of bleeding (10). A key feature of our research was management strategy. The majority of patients were treated conservatively by medications or endoscopic polypectomy, and only a minority needed surgical treatment. A randomized controlled trial on transfusion strategies in gastrointestinal bleeding by Kola et al. revealed that a restrictive transfusion strategy was safe and had the potential to prevent exposure to blood products without need, which we covered in our management algorithm (11).

The few cases that needed surgical intervention along with Meckel diverticulum had a good postoperative outcome. Solitary rectal ulcer syndrome and other less frequent diagnostics, such as Meckel diverticulum, were diagnosed in rare cases in which Meckel scans and histopathology confirmations were made. According to Ejaz et al., there was also a high rate of SRUS cases being recognized through recurrent LGIB, which indicated that its prevalence is likely underestimated unless proper histopathological examination is undertaken (12). Jaan et al. also stressed the effects of inter-hospital transfer on the outcomes because inter-hospital transfer delays tend to make the conditions worse and cause patients to spend more time in the hospital (13). This is why effective referral mechanisms and early access to diagnosis are required. Our clinical background of patients

corresponds to the results provided by Kumar et al., which revealed juvenile polyps and colitis to be predominant causes of pediatric LGIB with a relatively low hospital stay and complication rate (14). Nevertheless, systemic dichotomies, such as renal dysfunction, may aggravate the outcomes of both upper and lower GI bleeding despite them being rare comorbidities in our cohort of pediatric patients (15). The local experience gained by Azim et al. also proved the validity of the colonoscopic assessment of the case of per rectal bleeding among children (16). Although Menichelli et al. dwelled on older patients because of the presence of bleeding complications caused by anticoagulants, the significance of the individualized approach can be seen as the lesson shared by all groups of people (17). The prevalence of IBD in Pakistani children, which was proven according to an article by Khan et al., also dictates the importance of early screening when it comes to cases of recurrent LGIB (18). More uncommon causations, including Meckel diverticulum and vasculitic disorders like Henoch-Schonlein purpura (HSP), though uncommon in our cohort, should be placed in the differentiation line. Both Ramakrishnan et al. and Shah Hata discussed cases of LGIB that were missed because of these infrequent causes, urging care providers to keep a high index of suspicion when it comes to episodes of unknown or ongoing bleeding (19, 20).

CONCLUSION

In children, lower gastrointestinal bleeding (LGIB) is a clinically important disease with a broad range of underlying causes, which may include anything as benign as a non-dysplastic polyp to inflammatory bowel disease. The most prevalent etiology was juvenile polyps in our study, followed by non-specific colitis, solitary rectal ulcer syndrome, and inflammatory bowel disease. Colonoscopy had been shown as a diagnostic strategy that was safe, effective, and eased, making a timely and accurate diagnosis in most of the scenarios. On conservative or endoscopic therapy, most patients showed good improvement, with a very conducive symptom elimination and low recurrence probability. In a small number of patients whose structural anomalies included Meckel's diverticulum, surgical intervention was necessary. Early endoscopic assessment of LGIB in children, as we have found, is therefore vital to inform the choice of treatment and eventually enhance outcome. Additional investigations that incorporate bigger, multicentered experiments should be performed to create standard diagnostic procedures and optimize gastrointestinal patient care in heterogeneous medical backgrounds.

References

1. Irtaza M, Sundaram S, Gopan A, Patra BR, Rao PK, Kumar S, Kale AP, Shukla A. Lower gastrointestinal bleed in children: safety, utility, and yield of colonoscopy: an Experience from a large tertiary referral endoscopy center. Journal of Digestive Endoscopy. 2024 Mar;15(01):27-34.
2. Isa HM, Alkharsi FA, Ebrahim HA, Walwil KJ, Diab JA, Alkowari NM. Causes of gastrointestinal bleeding in children based on endoscopic evaluation at a tertiary care center in Bahrain. World Journal of Gastrointestinal Endoscopy. 2023 Apr 16;15(4):297.
3. Malik I, Sami A, Yousuf W, Tariq S, Jan S, Niyaz T. Etiological Profile of Lower Gastrointestinal Bleeding in Children and Adolescents from Kashmir; A Tale of 5 Years. Middle East Journal of Digestive Diseases. 2023 Jul 30;15(3):180.
4. Adeniyi OF, Lesi OA, Odeghe EA, Oyeleke G, Croft N. Gastrointestinal bleeding in children: the role of endoscopy and the sheffield scoring system in a resource-limited setting. JPGN reports. 2023 Nov 1;4(4):e369.
5. Alrashidi S, AlAmery T, Alshanbary A, Aljohani E, Bashir SM, Alsaleem B, Asery A, Al-Hussaini A. Disease patterns among Saudi children undergoing colonoscopy for lower gastrointestinal bleeding: Single tertiary care center experience. Saudi Journal of Gastroenterology. 2023 Nov 1;29(6):388-95.
6. Jamer T, Maleika P, Borys-Iwanicka A, Krzesiek E, Strożecki Ł, Stawarski A. A child with lower gastrointestinal bleeding–aetiology and diagnostic procedure. Pediatria Polska-Polish Journal of Paediatrics. 2022;97(3):193-9.

7. Joshi A, Singh Y. Clinicoetiological profile of patients with gastrointestinal bleed presenting to a tertiary care hospital in Kumaon Region of Uttarakhand. Asian Journal of Medical Sciences. 2024 Jan 1;15(1):127-34.
8. Soni A. Etiological Profile of Patients with Lower Gastrointestinal Bleed Undergoing Colonoscopy in a Tertiary Care Center. JK Science: Journal of Medical Education & Research. 2021 Mar 15;23(1):38-42.
9. Almadi MA, Almutairdi A, Alruzug IM, Aldarsouny TA, Semaan T, Aldaher MK, AlMustafa A, Azzam N, Batwa F, Albawardy B, Aljebreen A. Upper gastrointestinal bleeding: Causes and patient outcomes. Saudi Journal of Gastroenterology. 2021 Jan 1;27(1):20-7.
10. Malik I. Role of Colonoscopy In Children And Adolescents With Lower Gastrointestinal Bleeding; A Single Centre Experience From Kashmir, Northernmost India. International Journal. 2022 Sep;5(5):1037.
11. Kola G, Sureshkumar S, Mohsina S, Sreenath GS, Kate V. Restrictive versus liberal transfusion strategy in upper gastrointestinal bleeding: A randomized controlled trial. Saudi Journal of Gastroenterology. 2021 Jan 1;27(1):13-9.
12. Ejaz Z, Khan SU, Rehman RU, Jibran MS, Khan SU, Rehman R. Solitary rectal ulcer syndrome in patients presenting with lower gastrointestinal bleeding: A tertiary-care hospital experience. Cureus. 2023 Feb 21;15(2).
13. Jaan A, Sarfraz Z, Maryyum A, Farooq U, Ashraf MF, Warraich F, Mcfarland MS, Gutman J, Dunnigan K. The impact of inter-hospital transfer on outcomes in lower gastrointestinal bleeding: a retrospective cohort analysis. BMC gastroenterology. 2025 Mar 18;25(1):183.
14. Kumar N, Narang M, Aggarwal A, Sharma N. Lower Gastrointestinal Bleeding in Children: Clinical Profile and Outcome. Indian Journal of Medical Specialities. 2023 Apr 1;14(2):69-72.
15. Simon OA, Frim L, Farkas N, Sipos Z, Vörhendi N, Boros E, Pálinkás D, Teutsch B, Kalló P, Vass V, Szentesi A. Renal dysfunction contributes to deteriorated survival outcomes in patients with upper and lower gastrointestinal bleeding: insights from a cohort study of 1160 cases. Scientific Reports. 2025 Jan 30;15(1):3781.
16. Azim MA, Yousuf M, Shahed MM. Colonoscopic evaluation of per rectal bleeding in children: Our experience. Chattagram Maa-O-Shishu Hospital Medical College Journal. 2022 May 19;21(1):66-9.
17. Menichelli D, Gazzaniga G, Del Sole F, Pani A, Pignatelli P, Pastori D. Acute upper and lower gastrointestinal bleeding management in older people taking or not taking anticoagulants: a literature review. Frontiers in Medicine. 2024 May 3;11:1399429.
18. Khan D, Ullah I, Sohail M, Ghaffoor A. Frequency of Inflammatory Bowel Disease in Patients who Underwent Colonoscopy for Lower Gastrointestinal Bleeding. InMedical Forum Monthly 2024 Jan 30 (Vol. 35, No. 1).
19. Ramakrishnan R, Kuang K, Rajput V, Mohan S. Meckel's diverticulum: A rare and missed cause of adult gastrointestinal bleed. Clinical Case Reports. 2024 May 24;12(6):e9000.
20. Shah S, Hata J. A rare and severe presentation of henoch-schönlein purpura in an adolescent with crescentic glomerulonephritis, arrhythmia, acute gastrointestinal bleed, and neurological complications. Cureus. 2021 Mar 29;13(3).