

**ORIGINAL RESEARCH**

# Spectrum of gastro-intestinal bleeding in children: A single centre experience

<sup>1</sup>Sumit Kumar, <sup>2</sup>Abhigyan Pandey, <sup>3</sup>Gunjan Kela, <sup>4</sup>Shubhi Verma<sup>1-4</sup>Department of Pediatrics, Sri Aurobindo Medical College and Postgraduate Institute, Indore, India**Corresponding Author**

Shubhi Verma

Department of Pediatrics, Sri Aurobindo Medical College and Postgraduate Institute, Indore, India

Email: [shubhi0401@hotmail.com](mailto:shubhi0401@hotmail.com)

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**ABSTRACT**

**Background:** Etiological profile of gastrointestinal (GI) bleeding varies from benign conditions to life-threatening disorders, affecting either the upper or lower gastrointestinal tract with varied clinical presentations. **Aims and objectives:** This study was aimed to investigate the clinical profile and etiological spectrum of both upper and lower GI bleeding in children. **Material and Methods:** This was a cross-sectional study carried over a period of 18 months at a tertiary care from central India. Consecutive children from 1 month to 18 years of age presenting with history of upper or lower gastrointestinal bleeding were included. Data on demographics parameters, clinical presentations and aetiology were recorded in a data collection sheet. **Results:** Of 54 children included in our study, 31 (57%) were male with a mean age of 11 (SD-2.5) years at presentation. Majority had upper GI bleeding (n=39; 72%) while 13 (24%) had lower GI bleeding and 2 (4%) combined presentation. Most of the children had small volume (n=32; 59%) and painless bleeding (n=38; 70%). Anemia was found in all and blood transfusion was required in 21 (39%) children. Splenomegaly was present in 38 (70%) of children. The most common cause of upper GI bleeding was esophageal varices, [23, 59%] followed by gastritis [6; 15.4%]. Most common etiology of lower GI bleeding was single polyp, [n=3; 23%]. **Conclusion:** Upper GI bleeding was far common than lower GI bleeding with majority having small volume, painless GI bleeding. Variceal bleeding and polyps were the commonest causes of upper and lower GI bleeding respectively.

**Keywords:** Hematemesis, Melena, Child, Varices

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**INTRODUCTION**

Gastrointestinal (GI) bleeding in children is a significant health concern that requires prompt medical attention and appropriate management. It can arise from various etiologies, ranging from benign conditions to life-threatening disorders, affecting either the upper or lower gastrointestinal tract. Upper GI bleeding in children can be caused by a variety of conditions, including peptic ulcer disease, erosive gastritis, esophagitis, variceal bleeding due to portal hypertension, Mallory-Weiss tears, and less commonly, vascular malformations or neoplasms [1]. The clinical presentation may range from hematemesis (vomiting blood), melena (black, tarry stools), or occult bleeding with iron deficiency anemia. Common causes of lower GI bleeding include inflammatory bowel diseases (IBD) such as Crohn's disease and ulcerative colitis, infectious colitis, polyps, vascular malformations, and less commonly, neoplasms [2]. The data from India on gastrointestinal bleeding in children is sparse and restricted to either upper GI or lower GI bleeding [3-7]. Also, early identification of etiology of GI bleeding helps in the

timely management and may result in a favourable outcome. This study was aimed to investigate the clinical profile and etiological spectrum of both upper and lower GI bleeding in children presenting to a tertiary care centre from central India.

**MATERIAL AND METHODS**

This was a cross-sectional study carried over a period of 18 months from September 2022 to February 2024 in the department of Pediatrics at a tertiary care teaching hospital from central India. Consecutive children from 1 month to 18 years of age presenting with history of upper or lower gastrointestinal bleeding were included. Children below 1 month of age were excluded. Data on demographics parameters and clinical presentations (history and examination) were recorded in a preformed data collection sheet. Details of all relevant investigations including Hemogram, Coagulation profile (prothrombin time, activated partial thromboplastin time, Blood group, liver function tests, ultrasonography, Upper GI Endoscopy, Colonoscopy, Computed tomography, nuclear scan or any other investigation performed for

the management were noted. All the endoscopic procedure were performed by a trained Pediatric gastroenterologist under sedation with continuous monitoring. Fujifilm EG-720, EG-740N gastroscopes and EC-760ZP-V/L colonoscope were used for carrying out various endoscopic procedures. Study was approved by institute ethical committee.

### Statistical Analysis

Descriptive statistics was used to calculate for quantitative variable ( mean and standard deviation) and categorical variables( frequency and percentage). Statistical software, SPSS version 20.0 was used for statistical analysis.

### RESULTS

A total of 54 children were included in our study of which 31 (57%) were male resulting in a male-to-female ratio of 1.35:1. The mean age of children in present study was 11 (SD-2.5). Of 54 children, upper GI bleeding was far more common in 39 (72%) than lower GI bleeding in 13 (24%) children. Only 2 (4%) children had both upper and lower GI bleeding. Thirty two (59%) children had small volume bleeds while remaining 22 (41%) presented with large volume GI bleeding. Pain accompanying the GI bleeding was seen in 16 (30%) of children while remaining 38 (70%) had painless GI bleeding. GI bleeding requiring blood transfusion was seen in 21 (39%) children. Thirteen children were detected to have mild anemia, eight as moderate and 13 as severe anemia at the presentation. Hepatomegaly was seen in 12 (30%) and splenomegaly in 38 (70%) of children while ascites was observed in 9 (17%) children.

The etiology of upper GI bleeding is shown in table 1. The most common cause of upper GI bleeding in present study was esophageal varices, accounting for 23 cases (59% of upper GI bleed patients and 43% of total cases) followed by gastritis in 6 children (15.4% of upper GI bleed patients and 11.1% of total cases). All children with esophageal varices underwent endoscopic band ligation or sclerotherapy. Three children had Malory Weiss tear and were managed conservatively. One child with acute fulminant hepatitis with coagulopathy died of liver failure.

Table 2 depicts the causes of lower GI bleeding. The most common etiology identified was single polyp, accounting for 3 cases (23% of lower GI bleed patients and 5.5% of total cases). This was followed closely by solitary rectal ulcer syndrome (SRUS) and dysentery, each responsible for 2 cases (15.4% of lower GI bleed patients and 3.7% of total cases). All 3 children with rectal polyp underwent endoscopic hot snare polypectomy without complications. Another child with polyposis coli was referred for surgical management. Both the children with SRUS were treated with topical rectal steroids enema and laxatives. 2 children with inflammatory bowel disease (1 each of ulcerative colitis and Crohn disease) were started on immunosuppression therapy. One child with Meckel's diverticulum underwent surgical resection.

Two children in present study were detected to have both upper and lower GI bleeding. One child (1.8% of total cases) was attributed to intestinal TB with terminal ileal perforation and underwent surgery. The other child (1.8% of total cases) was a 4 months infant identified as late haemorrhagic disease of newborn which resolved after vitamin K injection.

**Table 1: Etiology of upper gastrointestinal bleeding in children**

Etiology	Number of patients (n=39)	% of out of 39	% out of 54
Varices	23	59	42.6
Gastritis	6	15.4	11.1
Malory Weiss Tear	3	7.7	5.5
Gastric Ulcer	1	2.6	1.8
Esophagitis	1	2.6	1.8
Milk Protein allergy	1	2.6	1.8
Acute Fulminant Hepatitis with Coagulopathy	1	2.6	1.8
Oral Thrush	1	2.6	1.8
Dental Caries	1	2.6	1.8
Factitious	1	2.6	1.8

**Table 2: Etiology of lower gastrointestinal bleeding in children**

Etiology	No. of patients (n=13)	% cases (out of 13)	% of Total cases (out of 54)
Single Polyp	3	23	5.5
SRUS	2	15.4	3.7
Dysentery	2	15.4	3.7
Multiple Polyps	1	7.7	1.8
Ulcerative colitis	1	7.7	1.8
Crohn's	1	7.7	1.8
Neutropenic colitis	1	7.7	1.8

Meckel's	1	7.7	1.8
Anal fissure	1	7.7	1.8

## DISCUSSION

This study provides valuable insights into the spectrum of gastrointestinal bleeding in children from a tertiary care centre in central India. The findings offer important information about the demographics, clinical presentation, etiology, and severity of both upper and lower GI bleeding in the pediatric population. We observed a slight male predominance (57.4% male vs 42.6% female) in our study population. This finding aligns with other Indian studies including Dubey et al who reported a male to female ratio of 2.16:1 in their study of lower GI bleeding, while Karnik et al found a male to female ratio of 1.3:1 in upper GI bleeding cases [4,6]. Our study revealed that upper GI bleeding (72.3%) was much more common than lower GI bleeding (24.1%), with only a small proportion of patients (3.7%) presenting with both upper and lower GI bleeding simultaneously. This predominance of upper GI bleeding is consistent with the general trend observed in pediatric GI bleeding literature. However, it's important to note that many Indian studies have focused exclusively on either upper or lower GI bleeding, making direct comparisons challenging [3-7]. Interestingly, the majority of cases in our study were painless (70.4%). This high rate of painless bleeding is a crucial finding, as it underscores the need for vigilance in diagnosing GI bleeding in children, even in the absence of pain. This aspect hasn't been explicitly highlighted in the other Indian studies reviewed, making it a unique contribution of our research to the existing literature. We found that 38.9% of patients required blood transfusion, indicating significant blood loss in many cases. Severe complications like loss of consciousness or shock occurred in 14.8% of cases. These findings highlight the potential severity of GI bleeding in children and the need for prompt and effective management. Karnik et al reported a higher mortality rate of 26% in their study of upper GI bleeding, particularly in patients with underlying hepatic failure and septicaemia [6]. While our study didn't specifically report mortality rates, the need for blood transfusion and the occurrence of severe complications in our population align with the potential seriousness of GI bleeding noted by Karnik et al [6]. We observed that 63% of patients presented with some degree of anemia, with severe anemia in 24.1% of cases. This high prevalence of anemia is consistent with other studies. For instance, Dubey et al reported anemia in 68.4% of patients with lower GI bleeding at the time of presentation [4]. The similarity in anemia prevalence across studies underscores the significant hematological impact of GI bleeding in children and highlights the importance of prompt evaluation and management of anemia in these patients.

The etiology of GI bleeding in our study showed distinct patterns for upper and lower GI bleeding. For upper GI bleeding, esophageal varices were by far the most common cause, accounting for 59% of upper GI cases. This finding is consistent with several other Indian studies. Bhaduria et al reported an even higher prevalence of esophageal or gastric varices (91.1%) in their study of upper GI bleeding in children aged 5-18 years [3]. However, our findings differ somewhat from those of Javid et al, who reported esophageal varices in 31% of cases, followed closely by duodenal ulcers (26.7%) [5]. This difference could be attributed to variations in the study population, geographical factors, or changes in the prevalence of underlying conditions over time. For lower GI bleeding, our study found a more diverse etiology, with single polyps being the most common cause (23% of lower GI cases). This is followed by solitary rectal ulcer syndrome (SRUS) and dysentery (15.4% each). In contrast, Dubey et al reported colitis and colorectal polyps as equally common causes (31.6% each) of lower GI bleeding, followed by anal fissures (21.1%) [4]. The difference in the distribution of causes could be due to variations in the study population, environmental factors, or diagnostic criteria. It's worth noting that our study identified some less common causes of lower GI bleeding, such as inflammatory bowel diseases (ulcerative colitis and Crohn's disease), neutropenic colitis, and Meckel's diverticulum. This diverse range of etiologies highlights the importance of a comprehensive diagnostic approach in pediatric lower GI bleeding cases.

Interestingly, we found only 2 cases (3.7%) that presented with both upper and lower GI bleeding simultaneously. These cases were attributed to ileal perforation and late hemorrhagic disease of the newborn. This finding emphasizes the rarity of combined upper and lower GI bleeding in children and the need for thorough investigation when such cases are encountered.

A key strength of our study is its comprehensive nature, including both upper and lower GI bleeding cases and covering a wide age range from infancy to 18 years. This broad scope provides a more complete picture of pediatric GI bleeding compared to some of the other studies reviewed, which focused on specific age groups or types of bleeding. However, our study also has limitations. The sample size of 54 patients, while providing valuable insights, is relatively small. Larger studies would be beneficial to confirm and expand upon our findings. Additionally, as a single-center study, our results may not be fully generalizable to all pediatric populations in India.

## CONCLUSION

In conclusion, this comprehensive study on gastrointestinal bleeding in children from a tertiary care center in central India provides valuable insights into clinical presentation and aetiology of this condition. Upper GI bleeding was far common than lower GI bleeding. Majority of the children with GI bleeding had Small volume and painless bleeding. Anemia was the most common and consistent finding. In children with upper GI bleeding, variceal bleeding was the commonest cause while colonic polyps were the commonest cause in lower GI bleeding. Further research, including the larger, multicenter studies is required to elucidate the detailed clinic-etiological profile and optimal management strategies for paediatric GI bleeding in India.

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