

## Original Article

## Chronic Lower Gastrointestinal Bleeding: Etiological Profile and Role of Colonoscopy among Children from sub-Himalayan Ranges of North India

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## ABSTRACT

**Background:** Most patients with chronic lower gastrointestinal (GI) bleeding warrant endoscopic examination of the lower GI tract. This study was done to determine the etiological profile of chronic lower GI bleeding and the role of colonoscopy in its diagnosis, as well as the prognosis among children from sub-Himalayan ranges of North India. **Methods:** In this study, we did a retrospective review of the clinical notes of children between 2 and 15 years of age who presented with chronic lower GI bleeding and underwent diagnostic and therapeutic colonoscopy in the Department of Gastroenterology, Indira Gandhi Medical College and Hospital, Shimla, from January 2012 to October 2017. Patient demographics, clinical features, and endoscopic and histopathological findings were recorded. **Results:** Of the total 57 patients reviewed, 22 (38.59%) were female and 35 (61.40%) were male, with a male-to-female ratio of 1.62:1.0. The highest incidence of lower GI bleeding was between the ages of 6 and 10 years (43.85%). The presenting symptoms were hematochezia in 50 (87.71%), bloody diarrhea in 5 (8.77%), and positive stool occult blood test in 2 (3.50%) patients. The most common accompanying symptom was constipation in 16 (28.07%), abdominal pain in 14 (24.56%), fever in 5 (8.77%), and weight loss in 5 (8.77%) patients. The most common colonoscopy finding was rectosigmoid polyps (36 cases, 63.15%) followed by internal hemorrhoids (9 cases, 15.78%), rectal ulcers (5 cases, 8.77%), findings suggestive of colitis of left colon (5 cases, 8.77%), and findings suggestive of ileocecal tuberculosis (2 cases, 3.50%). The most common histopathological finding was juvenile colorectal polyps (35 cases, 61.40%) followed by solitary rectal ulcer (5 cases, 8.77%), ulcerative colitis (5 cases, 8.77%), tuberculosis (2 cases, 3.50%), and Peutz–Jegher polyp (1 case, 1.75%). **Conclusion:** Juvenile colorectal polyps constitute the most common cause of chronic lower GI bleeding in children from sub-Himalayan ranges of North India followed by hemorrhoids, solitary rectal ulcer, inflammatory bowel disease, and ileocolonic tuberculosis. Colonoscopy remains a useful and safe procedure in children for evaluation of lower GI bleeding both from the diagnostic and therapeutic points of view.

**KEYWORDS:** *Gastrointestinal, inflammatory bowel disease, solitary rectal ulcer syndrome, tuberculosis*

## INTRODUCTION

Gastrointestinal (GI) bleeding is considered an alarming sign in any age group and should be approached meticulously. Moreover, in children, GI bleeding causes panic and stress for parents. Lower GI

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bleeding is defined as blood loss distal to the ligament of Treitz, which is located at the duodenojejunal flexure.<sup>[1]</sup> In recent years, upper GI bleeding has been redefined as bleeding above the ampulla of Vater within reach of an upper endoscopy; lower GI bleeding has been further subdivided into mid GI bleeding coming from the small bowel between the ampulla of Vater to the terminal ileum and lower GI bleeding coming from the colon.<sup>[2]</sup> There are several etiologies for lower GI bleeding in the pediatric practice ranging from mild conditions requiring little or no treatment to severe and life-threatening ones requiring immediate intervention.<sup>[3]</sup> The etiologies also vary according to the different age groups, which enables physicians to make appropriate differential diagnoses.<sup>[4]</sup> In a retrospective review of the children under 15 years of age with chronic lower GI bleeding, the causes of bleeding were juvenile colorectal polyps (75%), nonspecific proctitis (18%), solitary rectal ulcer (3.5%), lymphoid nodular hyperplasia (3%), and foreign body (betel nuts) impaction (0.5%).<sup>[5]</sup> In another study by Ridder *et al.*<sup>[6]</sup> among 137 pediatric patients with prolonged rectal bleeding, inflammatory bowel disease (IBD) and colorectal polyps were the most prevalent diagnoses. Most patients with chronic lower GI bleeding warrant endoscopic examination of the lower GI tract for diagnosis and management.<sup>[7]</sup> Colonoscopy is the investigation of choice in children with prolonged rectal bleeding.<sup>[6]</sup>

Common causes of lower GI bleeding vary between studies. Therefore, regional epidemiological data should be available in order to assist physicians with better management of these patients. As data regarding this issue are sparse in our region, we have performed this study in order to determine the common etiologies of lower GI bleeding and to explore the utility of colonoscopy in its diagnosis and management.

## METHODS

In this study, we did a retrospective review of the clinical notes of children between 2 and 15 years of age who presented with chronic lower GI bleeding (chronic bleeding was defined arbitrarily as duration of more than 1 month to exclude common infective causes leading to bloody diarrhea, as they do not require specialized investigations) and underwent diagnostic and therapeutic colonoscopy in the Department of Gastroenterology, Indira Gandhi Medical College and Hospital (IGMC), Shimla. Most children were referred from the Department of Pediatrics, IGMC, Shimla, for evaluation of the cause of chronic lower GI bleed, while some children presented directly to our outpatient department. We enrolled children between 2 and 15 years of age with gross lower

GI bleed (fresh or altered blood in stool visible with naked eyes) or two consecutive positive stool occult blood tests with at least 1 month interval between the tests (for microscopic bleeds). All the colonoscopies were performed by an experienced gastroenterologist, under conscious sedation with prior bowel preparation. The colonoscopy procedure was properly explained, and informed consent from the parents was obtained before the procedure. All colonoscopies were performed using small flexible Olympus PCF-20 pediatric colonoscope (Olympus, Tokyo, Japan). The bowel was prepared with 238 g of polyethylene glycol (PEG)-3350 in 2 L of water during 2 h in the night before the colonoscopy. Effective bowel cleansing was seen in 90% of patients (on first bowel preparation), regardless of age, history of constipation, or indication for the procedure. Those patients with inadequate bowel preparation during the first procedure were given repeat preparation with similar regimen of PEG-3350. Full-length colonoscopy till the cecum and ileum (where required) was achieved in all the patients. The patients were administered midazolam at a dose of 0.05–0.15 mg/kg intravenously, in 2–3 divided bolus doses, each bolus dose to be given over 1–2 min, starting a few minutes before the colonoscopy as a sedative agent. Monitoring was done with pulse oximeter during colonoscopy and the resuscitation kit was kept at bed side. Biopsies were taken under direct colonoscopic visualization and fixed in phosphate-buffered formalin. All slides were reviewed by an experienced pathologist and results were recorded. Patient demographics, clinical features, and endoscopic and histopathological findings were recorded. Patients were categorized as toddler and preschool children (2–5 years), school-going children (6–10 years), and adolescents (11–15 years).

## RESULTS

Of the total 57 patients reviewed, 22 (38.59%) were female and 35 (61.40%) were male, with a male-to-female ratio of 1.62:1.0 [Table 1]. The highest incidence was between the ages of 6 and 10 years (43.85%) [Table 1].

The presenting symptoms were hematochezia (passage of bright red blood per rectum) in 50 (87.71%), bloody diarrhea (containing fresh and altered dark blood mixed with stool) in 5 (8.77%), and positive occult blood test in 2 patients (3.50%) [Table 2]. The most common accompanying symptom was constipation in 16 (28.07%), abdominal pain in 14 (24.56%), fever in 5 (8.77%), and weight loss in 5 (8.77%) patients [Table 2].

The most common colonoscopy finding [Figures 1, 2 and Table 3] was rectosigmoid polyps

(36 cases, 63.15%) followed by internal hemorrhoids (9 cases, 15.78%); rectal ulcers (5 cases, 8.77%); findings suggestive of left-sided colitis (5 cases, 8.77%) with contiguous circumferential loss of vascularity, granularity, friability with superficial ulcerations starting from rectum till splenic flexure; and findings suggestive of ileocecal tuberculosis (2 cases, 3.50%) with nodularity, transverse ulceration, and luminal narrowing involving terminal ileum, cecum, and proximal ascending colon.

The most common histopathological finding [Figure 3 and Table 3] was juvenile colorectal polyps (35 cases, 61.40%) followed by solitary rectal ulcer (5 cases, 8.77%), chronic active colitis suggestive of idiopathic ulcerative colitis (5 cases, 8.77%), caseating granulomatous inflammation with positive staining for acid-fast bacilli (AFB) suggestive of

tuberculosis (2 cases, 3.50%), and Peutz-Jegher polyp (1 case, 1.75%).

Patients with polyps had presented with painless, bright red rectal bleeding with normal stool frequency and consistency. All polyps were in the rectosigmoid region and solitary. All polyps were removed by colonoscopic polypectomy and subjected to histopathological examination. Histological examination of polyps revealed juvenile type in most patients, while Peutz-Jegher in one patient. Follow-up colonoscopy was done in children with Peutz-Jegher polyp only as no juvenile polyp patient satisfied the criteria for juvenile polyposis syndrome, and hence follow-up colonoscopy was not done. Children with hemorrhoids and solitary rectal ulcer had a history of associated constipation and straining during defecation. These children were managed with high-fiber diet and laxatives. Five patients with bloody diarrhea were diagnosed to have IBD (left-sided ulcerative colitis), based on history, clinical examination, colonoscopic findings, and histopathological examination showing evidence of chronic active colitis with crypt branching and distortion. All were managed with 5-aminosalicylic acid derivatives and showed clinical improvement. Two patients with ileocecal transverse ulceration and nodularity with patulous ileocecal valve on colonoscopy were diagnosed to have ileocolonic tuberculosis based on histopathological examination revealing caseating granulomatous inflammation with positive staining for AFB on Ziehl-Neelsen stain. Both were adolescents and with a positive family history of pulmonary tuberculosis. Both were managed with 6-month course of Anti tubercular treatment (ATT). Both showed clinical

**Table 1: Age-group breakup of the study patients**

Age group (years)	Number of females/(%)	Number of males/(%)
2-5	8 (40)	12 (60)
6-10	9 (36)	16 (64)
11-15	5 (41.66)	7 (58.33)
Total	22 (38.59)	35 (61.40)

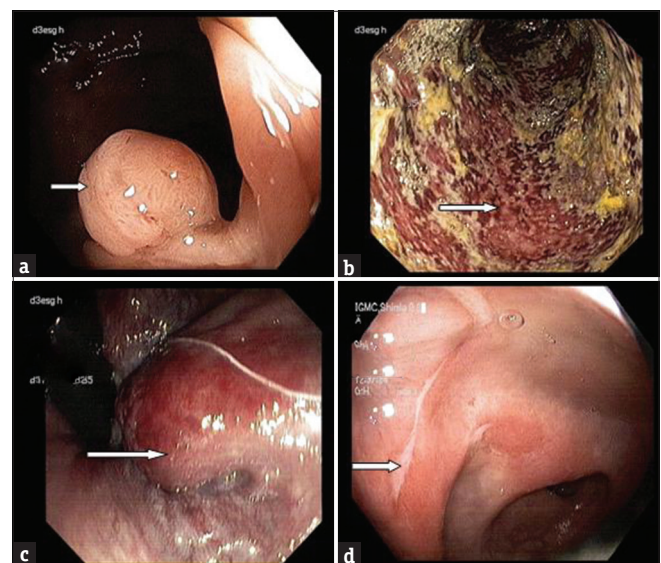
**Table 2: Clinical presentation**

Presenting/associated symptoms	Number (%)
Presenting complaints (%)	
Hematochezia	50 (87.71)
Bloody diarrhea	5 (8.77)
Positive stool occult blood	2 (3.50)
Associated symptoms (%)	
Constipation	16 (28.07)
Abdominal pain	14 (24.56)
Fever	5 (8.77)
Weight loss	5 (8.77)

**Table 3: Etiology on colonoscopic and histopathology examination**

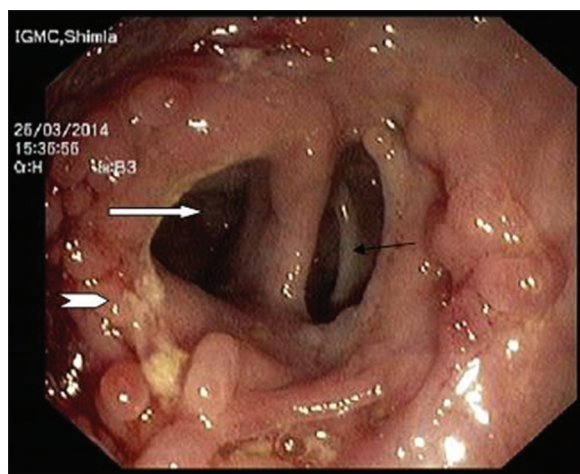
Etiology	n (%)
<b>Colonoscopic findings</b>	
Rectosigmoid polyp	36 (63.15)
Internal hemorrhoids	9 (15.78)
SRUS	5 (8.77)
Left-sided colitis	5 (8.77)
Ileocecal ulceration with nodularity	2 (3.50)
<b>Histopathological findings</b>	
Juvenile polyps	35 (61.40)
Solitary rectal ulcer	5 (8.77)
Ulcerative colitis-chronic active colitis	5 (8.77)
TB-caseating granulomatous inflammation, AFB present	2 (3.50)
Peutz-Jegher polyp	1 (1.75)

AFB=Acid-fast bacilli, SRUS=Solitary rectal ulcer syndrome, TB=Tuberculosis



**Figure 1:** (a) Arrow showing polyp in rectosigmoid (b), arrow showing contiguous, circumferential ulceration with sloughing suggestive of ulcerative colitis (c), arrow showing internal hemorrhoids (d), arrow showing rectal ulcer suggestive of solitary rectal ulcer syndrome





**Figure 2:** Arrow showing gaping ileocecal valve, arrowhead showing structuring, ulceration, and nodularity in proximal ascending colon, and black arrow showing narrowed opening into the cecum

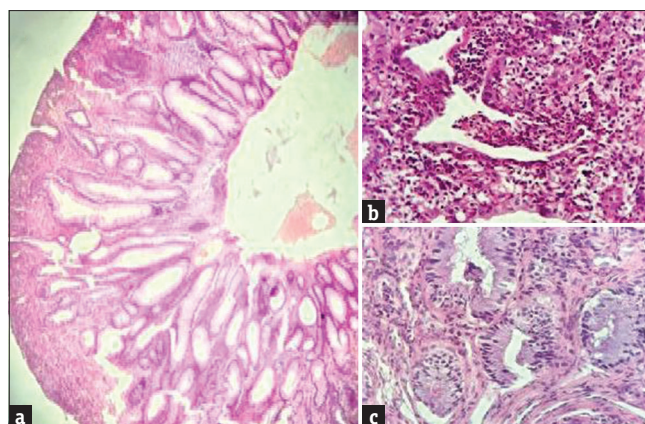
improvement with resolution of symptoms of fever and anorexia and gain in weight. Follow-up colonoscopy on completion of ATT revealed scarred area in the cecum with gaping ileocecal valve.

## DISCUSSION

GI bleeding is an alarming event both for the child and parents. This study evaluated the clinical records of 57 children to understand the clinical and etiological patterns of lower GI bleeding in children.

Our study had a male-to-female ratio of 1.62:1.0, with the most common age group being 6–10 years (schoolgoing age). This is in accordance with the study done by Bhadauria *et al.*<sup>[8]</sup> where the male-to-female ratio was 2.16:1, and the most common age group was 5–10 years. In our study among children between the ages of 2 and 15 years, juvenile rectosigmoid polyp was the most common cause of bleeding (61.40%). Two studies conducted in Pakistan<sup>[9,10]</sup> among children with lower GI bleeding have reported colorectal polyps as the most common cause of rectal bleeding in children. Another study from Iran<sup>[11]</sup> reported polyp of sigmoid colon as the most common colonoscopy finding among children complaining of bleeding per rectum. In a retrospective review of children under 15 years of age with chronic lower GI bleeding, juvenile colorectal polyps constituted 75% of the cases, of which 88% were solitary and in rectosigmoid region.<sup>[5]</sup>

In our study, all polyps were in the rectosigmoid region and solitary. All polyps were removed successfully by colonoscopic snare polypectomy. In a study of colorectal polyp in children, 97% of polyps were localized in the rectum or sigmoid colon and 96.2% were histologically juvenile polyps.<sup>[12]</sup> The author suggested that outcome



**Figure 3:** (a) Characteristic dilated cystic glands of juvenile polyp, (b) heavy infiltration of chronic inflammatory cells of ulcerative colitis, (c) fibromuscular hyperplasia of lamina propria characteristic of solitary rectal ulcer syndrome

after endoscopic polypectomy is generally good. In an Indian study of 236 children with colorectal polyps, 93% of the polyps were juvenile and 85% were rectosigmoid in location.<sup>[13]</sup> However in comparison to our study where all polyps were solitary, in this study, solitary polyps were seen in 76%, multiple polyps in 16.5%, and juvenile polyposis in 7% of the children. A significant number of cases of polyps were multiple and proximally located, which emphasizes the need for total colonoscopy in all cases. Colonoscopic polypectomy was done for all juvenile polyps because of their neoplastic potential and was effective even in juvenile polyposis.<sup>[13]</sup> Surveillance colonoscopy was required in juvenile polyposis only.<sup>[13]</sup> There was no case of juvenile polyposis in our study, so follow-up colonoscopy was not done.

Other causes of chronic lower GI bleeding among children in our study included hemorrhoids (15.78%), solitary rectal ulcer (8.77%), IBD (8.77%), and colonic tuberculosis (3.50%). In a study from Iran regarding the etiology of lower GI bleed in children,<sup>[11]</sup> juvenile polyp and solitary rectal ulcer accounted for most of the pathologies that caused rectal bleeding in children and adolescents, respectively. IBD though a common cause of lower GI bleeding in a European study<sup>[6]</sup> and in a study from Pakistan (21.25%)<sup>[9]</sup> accounted for only 8.77% of cases in our study and all were cases of ulcerative colitis. Colonic tuberculosis was an uncommon cause of lower GI bleeding, which accounted for only 3.50% of cases.

## CONCLUSION

Juvenile colorectal polyps constitute the most common cause of chronic lower GI bleeding in children from sub-Himalayan ranges of North India followed by hemorrhoids, solitary rectal ulcer, IBD in the form

of ulcerative colitis, and ileocolonic tuberculosis. Colonoscopy remains a useful and safe procedure in children for evaluation of lower GI bleeding both from the diagnostic and therapeutic points of view.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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