

**Lower Gastrointestinal Bleeding in Children: Experience in Odisha, India**

<sup>1</sup>Swarupa Panda, Associate Professor Dept. of Paediatrics SCB MCH, Cuttack

<sup>2</sup>Devanand Mohapatra, Professor Dept. of Gastroenterology Hi-Tech MCH, Bhubaneswar

<sup>3</sup>Arakhita Swain, Professor Dept. of Paediatrics SLN MCH, Koraput

<sup>4</sup>Saiprasanna Behera, Research Associate, SCB MCH, Cuttack

**Corresponding Author:** Prof. Dr Devanand Mohapatra, Professor Dept. of Gastroenterology Hi-Tech MCH, Bhubaneswar

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**Abstract**

**Background:** Though lower gastrointestinal bleeding (LGIB) in infants and children are not uncommon, still its epidemiologic properties have not been studied well.

**Objectives:** LGIB has various causes in different geographical areas. Considering the importance of etiology in decision making for diagnosis and treatment and the lack of comprehensive database related to this issue, the main purpose of the current study was to determine the main causes of LGIB in children in Odisha, Eastern India.

**Material and Methods:** The study was conducted on all the patients less than 14 years old with LGIB admitted to Pediatric ward of SCBMCH, SLNMCH and Gastroenterology Department of Hi-Tech MCH between July 2018 and June 2020. The data, including the patient’s sex, age, and investigations were collected and analyzed.

**Results:** Overall, our series included a total of 154 patients with LGIB of which 92 were males and 62 were females. The most common causes of LGIB

included colorectal polyps (n = 45; 29.1%), lymphoid nodular hyperplasia (n = 16; 10 %), Infective Colitis (n= 15; 9.8%), solitary rectal ulcer (n =15; 10%), and inflammatory bowel disease (n = 10; 6.5%), other causes being (n=06; 3.9%) Nevertheless, no obvious causes were identified in (n=47; 30.7%) of the patients. The prevalence of lymphoid nodular hyperplasia in < 2 years old patients and colorectal polyps in the 2-6 years old patients were significantly higher than the other causes (P = 0.001). Most cases with inflammatory bowel diseases and solitary rectal ulcer were more than 2 years old. On the other hand, no statistically significant differences were observed between males and females as well as different age groups regarding the means of the underlying causes of LGIB (P > 0.05).

**Conclusions:** The results of present study could be used as a data to analyze an overall picture of LGIB in Odisha, Eastern India as well as guide its management.

**Keywords:** LGIB

## Introduction

Bleeding may occur anywhere along the gastrointestinal (GI) tract and, seeing the blood in the child's stools makes the care giver as well as the child extremely anxious. Lower gastrointestinal bleeding (LGIB) is a serious and sometimes threatening condition in both infants and children, which can have a range of causes (1). LGIB is described as bleeding originating from the intestine distal to the ligament of Treitz which is placed at the junction of the duodenum and jejunum. LGIB in infants and children is a common problem in medical centers; however, only a limited number of studies have been conducted on its epidemiologic properties. Epidemiological data on LGIB can present useful information for developing strategies to reduce the frequency of LGIB and direct the clinical management of the patients with LGIB. On the other hand, differences have been observed in the causes of LGIB in different geographical places and consequently, it is necessary to determine the etiology of LGIB in each local site. The etiology of LGIB is different in children and the adults and the causes are usually simple and require little or no treatment, for example, anal fissure and juvenile polyps, but sometimes these symptoms may indicate more severe and life-threatening conditions, such as intussusception, Meckle's diverticulum, and midgut volvulus (1-3). The differential diagnosis of the LGIB in infants and children however, includes numerous possibilities ranging from benign disorders, which require little or no treatment at all, to serious diseases that require immediate intervention.

## Objectives

The present study aims to determine the main causes of LGIB in the patients below 14 years of age in Odisha, Eastern India. .

## Material and Methods

All patients less than 14 years of age with LGIB admitted to Pediatric Department of SCB MCH, SLNMCH and Gastroenterology Department of Hi-Tech MCH were enrolled in this multicentric cross sectional study. All the patients were categorized into four age groups of less than 2, 2-6, 6-10, and 10-14years old. Differential diagnosis was carried out for each patient and the definite causes of the LGIB were determined using clinical and para clinical examinations. Age, sex and definite diagnosis of the underlying cause of LGIB were collected and analyzed. The study was approved by Institutional ethical committee.

## Statistical Analysis

All values are presented as mean  $\pm$  standard deviation (SD) with 95% confidence intervals. Statistical differences between the parameters were tested using Chi-square test. The Statistical analysis of the study data was carried out using the SPSS statistical software (V. 16.0) (SPSS, Chicago, IL, USA).

## Results

There were 154 cases with LGIB (92 males, 62 females). The demographic characteristics of these 154 patients are summarized in Table 1. There were 32 (21%) patients aged less than 2 years old, 70 (45.3%) patients aged between 2 and 6 years, 28 (18.4%) patients aged between 6 and 10 years, and 24 (15.2%) cases aged between 10 and 14 years. The most common causes of LGIB included colorectal polyps (n = 45; 29.1%), lymphoid nodular hyperplasia (n = 16; 10%), Infective Colitis (n=15; 9.8%), Solitary rectal ulcer (n = 15; 10%), inflammatory bowel disease (n =10; 6.5%), and anal fissure, hemorrhoids, Peutz Jegher syndrome, vascular malformations, juvenile polyposis coli, intussusceptions, Meckle's diverticulum, and

thrombocytopenia in (n= 6; 3.9%) of the patients. However, the cause of hemorrhage remained undiagnosed in (n=47 30.7%) patients. The etiologies of these 154 patients according to different age groups and sex are listed in Table 2. In comparison to the other groups, the prevalence of lymphoid nodular hyperplasia in the less than 2 years old group and colorectal polyps in the 2-6 years group were significantly higher than the other causes (P = 0.001). Most cases with inflammatory bowel diseases and solitary rectal ulcer were aged more than 2 years. On the other hand, no statistically significant differences were observed between males and females as well as different age groups regarding the means of the underlying causes of LGIB (P > 0.05).

Table 1: Characteristics of the 154 Patients with Lower Gastrointestinal Bleeding

	Frequency	%
Sex		
Male	92	60
Female	62	40
Age		
≤ 2	32	21
2-6	70	45.4
6-10	28	18.4
10-14	24	15.2
Etiology		
Colorectal Polyp	45	29.1
LNHa	16	10
Infective Colitis	15	9.8
Solitary Rectal Ulcer	15	10
IBDa	10	6.5
Others	06	3.9
No obvious disease	47	30.7
Total	154	100

aAbbreviations: LNH, Lymphoid nodular hyperplasia; IBD, Inflammatory bowel disease

Table 2: Etiology of the 154 Patients with Lower Gastrointestinal Bleeding According to Different age groups and sex

Etiology	< 2	2- 6	6- 10	10- 14	Male, %	Female,%	Subtotal
Colorectal Polyps	05	31	06	03	28, 63%	17, 37%	45
LNHa	04	06	04	02	0 9,56%	07, 44%	16
Infective Colitis		08	06	01	0 9,56%	06, 44%	15
Solitary Rectal Ulcer	01	05	04	05	09, 56%	06, 44%	15
IBDa	0	03	02	05	03, 30%	07, 70%	10
Others	03	02	0	01	04,66%	02, 34%	06
No Obvious Disease	08	18	13	08	30, 61%	17, 39%	47
Total	21	73	35	25	92, 60%	62, 40%	154

Abbreviations: LNH, Lymphoid nodular hyperplasia; IBD: Inflammatory bowel disease

### Discussion

Lower GI bleeding is defined as bleeding originating from the intestine distal to the ligament of Treitz. Bloody diarrhea and bright red blood mixed or red coated stool are the classic presentations of LGIB. Moreover, the LGIB accounts for approximately one-fifth of all the cases of acute GI bleeding (4). Farrell and Friedman (2005) reported the incidence of LGIB as 20.5 to 27 cases per 100,000 adults in the U.S. (5). Bai et al. (2010) investigated 160 studies which provided the data of 53951 patients with LGIB in china (6). Based on these studies, colorectal cancer, colorectal polyps, colitis, ano-rectal disease, and inflammatory bowel disease were the most prevalent etiologies of LGIB in the Chinese adult population. In a previous study in India, the main causes of LGIB (n = 64) were revealed to be colitis (n = 27; 42%) and colorectal polyps (n = 26; 41%) (7). In the present study, the most common causes of LGIB included colorectal polyps, lymphoid nodular hyperplasia, infective colitis, solitary rectal ulcer, and inflammatory bowel disease. Colonic

diverticula, angiodysplasias, inflammatory bowel disease, and postpolypectomy bleeding have been suggested as the most frequent causes of acute LGIB in the epidemiologic studies on Western populations (8).

Different studies have reported different causes for LGIB. Nevertheless, the causes of LGIB in Eastern studies are somewhat different from the Western reports. For instance, in the systematic review performed by Bai et al. (6), colonic diverticula only accounted for 1.1% of all the 53951 Chinese LGIB patients. In the same line, it accounted for less than 1% of our study patients. Nevertheless, diverticulitis was the reported cause of GI bleeding in 17–40% of patients (9) and is an important cause of LGIB in Western populations. Inflammatory bowel diseases including ulcerative colitis and Crohn's disease are common causes of LGIB, usually apparent as bloody diarrhea (10). It was estimated that 6 percent of the patients with either Crohn's colitis or ulcerative colitis suffered from severe LGIB, as well (11, 12). In the current study, the prevalence of inflammatory bowel disease was 6.5 percent. Anal fissure is possibly the most general cause of rectal bleeding in infants and young children. In addition, colorectal polyps can be the cause of LGIB in preschool age and older children and inflammatory bowel disease is an important cause of LGIB which is highly prevalent among the younger children (school age children and adolescents) (13-15). Age can also provide a sign to the cause of acute LGIB; younger patients be predisposed to bleeding from hemorrhoids, vascular malformation, and solitary rectal ulcers, while older patients tend to bleed from diverticula, vascular malformations, and neoplasms (16).

In the present study, solitary rectal ulcers were seen in 15 of 154 patients (10%) that may be due to better understanding and diagnosing of this entity. In adult

patients, men and women are affected equally with a small predominance for women, but 75%-80% of children with SRUS are boys (18), as we see, 15 (10%) cases of solitary rectal ulcers in the current series show that 56% were boys and 44% were girls. In the present study, colorectal polyps were the most prevalent causes of LGIB among the children. Similar to our study results, in the studies conducted by Bai et al. (6) and Perisic (19) on the children with LGIB, the prevalence of colorectal polyps was higher than the other causes. Rafeey M (20) in a study on 59 children with LGIB reported polyps as a cause of LGIB in one third of patients. Bai et al. (6) found that the proportion of colorectal polyp induced LGIB increased with the patients' age. In our study, the prevalence of colorectal polyp in the 2-6 years old group was higher in comparison to the other groups. Lymphoid nodular hyperplasia is part of the generalized lymphoid hyperplasia associated with viral infections in infancy and childhood and immunodeficiency states as a cause of the lymphoid hyperplasia should always be excluded by estimation of serum immunoglobulin (22). Capitanio MA et al. (23) reported a rectal bleeding caused by the lymphoid hyperplasia. Lymphoid nodular hyperplasia should be considered as a differential diagnosis of LGIB in every infant who presents with LGIB under age of 2 years especially in breast fed infants. Infective colitis in tropical countries like india is also a common presentation of LGIB, in our study it was 9.7 % About 30.7% of colonoscopies was non-diagnostic in this study which is within the range reported in other studies; the study done by Clarke, et al (24) reported 30% normal results.. Colonoscopy, even in the best centers of the world cannot find any abnormality in 10%–30% of patients with LGIB that might be attributed to several causes such as hidden positions of

lesions between intestinal folds, incomplete colonoscopy since poor bowel preparation and presence of lesions are not examined segments, auto-amputation of polyps and repaired ulcer or other lesions before performing the procedure (21). Despite many reports on the identification and management of LGIB in the Western literature, relatively few reports from Asian countries have been published. Besides, there is limited information on the epidemiology of LGIB in India and the present study is one of the few one carried out on this topic on the Indian patients. In spite of all the limitations, we suggest that the present study could be used by the Indian physicians in order to gain an overall picture of LGIB and guide the management of the patients with LGIB.

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