



Frequency of Intussusception in Patients Presenting with Bloody Diarrhea

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ARTICLE INFO

Keywords: Intussusception, bloody diarrhea, abdominal ultrasonography

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Declaration

Authors' Contribution: All authors equally contributed to the study and approved the final manuscript.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History

Received: 29-05-2025 Revised: 03-07-2025
Accepted: 06-07-2025 Published: 15-07-2025

ABSTRACT

Background: Intussusception is a common cause of intestinal obstruction in young children and may present atypically as bloody diarrhea, leading to delayed diagnosis and increased morbidity. Early identification is essential to prevent serious complications. **Objective:** To determine the frequency of intussusception in children presenting with bloody diarrhea at the Pediatrics Unit of Ayub Teaching Hospital, Abbottabad. **Methods:** This cross-sectional study was conducted from November 2024 to May 2025 and included 87 children aged 2 months to 14 years presenting with bloody diarrhea, enrolled through consecutive non-probability sampling. Children with prior abdominal surgery or congenital gastrointestinal malformations were excluded. Diagnosis of intussusception was confirmed by abdominal ultrasonography. Data were analyzed using SPSS version 27.0 and associations were assessed using Chi-square or Fisher's exact test, with $p \leq 0.05$ considered statistically significant. **Results:** Intussusception was diagnosed in 7 (8.04%) out of 87 children presenting with bloody diarrhea. Among these, 85.7% (n=6) were below 2 years of age, while 14.3% (n=1) were older than 2 years. A statistically significant association was observed between age <2 years and intussusception ($p = 0.02$). Male predominance was noted (70.1% males; male-to-female ratio 2.4:1); however, the association between gender and intussusception was not statistically significant ($p = 0.93$). Common presenting symptoms included abdominal pain (81.6%), vomiting (63.2%), and fever (58.6%). **Conclusion:** Intussusception was identified in a notable proportion of children presenting with bloody diarrhea, particularly among those under two years of age. Younger age showed a statistically significant association with intussusception, while gender did not. These findings highlight the importance of maintaining a high index of suspicion and early ultrasonographic evaluation in young children presenting with bloody diarrhea to enable timely diagnosis and reduce complications

INTRODUCTION

Intussusception is a condition in which one part of intestine invaginate into adjacent intestinal segment causing intestinal obstruction. It contributes the most in abdominal emergencies among children with age of less than 2 years.^{1,2} The most common type of intussusception causing intestinal obstruction is ileocolic intussusception.³ The peak age of intussusception is 4 -10 months.⁴ In developed countries the incidence of intussusception in infants is between 34-100 per 100,000 children.⁴ However the global incidence of intussusception is 1- 4 per 2000 children.⁵

Male to female ratio is 2:1⁶

The exact cause of intussusception is still unknown; however, it is thought to be associated with abnormal bowel movements. Lymphoid hyperplasia occurring as a result of gastrointestinal infection is also considered as an important risk factor of intussusception which occurs in 5-

10% of the patients.^{2,4} Viruses such as adenovirus and rotavirus and some bacteria such as *Yersinia enterocolitica* and *Campylobacter jejuni* are also associated with intussusception.⁷

Intussusception manifest itself as a result of invagination of one part of intestine into its adjoining segment. The part which invaginates is known as intussusceptum which obstruct the intestinal vascularity leading to impaired lymphatic drainage, intestinal wall edema, mucous and bleeding from the bowel wall resulting in blood stained stools.⁶

Clinical presentation of intussusception in children is a classical triad of abdominal cramps, palpable abdominal mass and bloody stools. Abdominal cramps in intussusception occur at regular interval and in between the spells patient remains well and playful. Intussusception is felt as a sausage shaped mass commonly found in right hypochondrium.⁶ Bloody

diarrhea occurs in 6% cases of intussusception.⁸ Mostly children initially present with non-bilious vomiting which can be converted into bilious vomiting later on when abdominal distension occurs.⁶

There are various methods to confirm the diagnosis of intussusception including ultrasound abdomen, abdominal CT- scan, contrast enema.² Ultrasound abdomen is the most commonly used first line scan while contrast enema is gold standard in the diagnosis of intussusception.⁴

One of the complications of the intussusception is intestinal ischemia and perforation which can lead to death. Any delay in identification of the disease can result in devastating consequences. Therefore, outcome of the disease greatly depends on early recognition of signs and symptoms and its timely diagnosis.^{9 10}

Early diagnosis aids in early management of the disease, which includes operative or non-operative reductions.⁴

Considering current challenges, the aim of study is to determine the frequency of intussusception in patients presenting with bloody diarrhea. Despite of high incidence rate in burden of disease lack of statistics necessitates research work in this domain in order to early diagnose and intervene the disease. Furthermore, this study will aid knowledge to present studies; thereby, enabling healthcare providers to devise strategies to combat this problem.

Objectives

To determine the frequency of intussusception in patients presenting with bloody diarrhea in pediatrics unit of Ayub Teaching Hospital, Abbottabad.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Pediatrics unit of Ayub Teaching Hospital, Abbottabad, starting from November 2024 to May 2025, using a consecutive non-probability sampling technique. A total sample size of 87 patients was calculated using WHO software for sample size determination in health studies, based on an assumed 6% frequency of intussusception among children presenting with bloody diarrhea, with a 95% confidence interval and 5% absolute precision. Ages of all the enrolled patients were from 2 months to 14 years of either gender presented to the pediatric OPD and emergency department with bloody diarrhea were included, while those with a history of abdominal surgery or congenital gastrointestinal tract malformations were excluded. The study was initiated after approval from the hospital ethical committee and CPSP research committee, and informed consent was obtained from parents or caregivers after explaining the purpose, benefits, and risks of the study. Demographic data including age, gender, and place of residence was recorded, and relevant investigations such as abdominal ultrasonography was performed after consent. The researcher collected the investigation reports and recorded all the data on a predesigned structured proforma, ensuring confidentiality and privacy of the collected information.

Data Analysis

Data were analyzed using the SPSS version 27.0. Categorical data like gender, residence, maternal

education, socioeconomic status and presence or absence of intussusception were described in terms of frequencies and percentages. Numeric variables like age, weight were described as mean \pm SD or median (IQR) based on normality of data checked by Shapiro wilk test. Intussusception and its outcome was stratified among age, gender, weight, symptoms and other variables. Post stratification chi-square test/Fisher's exact test was applied in which P value of ≤ 0.05 shall be considered as significant.

RESULTS

The frequency of intussusception was 7 (8.04%) patients out of 87 enrolled patients. Out of these 7 patients 6 (85.7%) were below 2 years of age and 1 (14.3%) were above 2 years of age.

The enrolled patient's mean age was 2.8 ± 1.2 years. Among these patients 69 (79.31%) were below 2 years of age and 18 (20.69%) were above 2 years of age. Mean weight of these patients was 11.5 ± 4.2 kg.

Out of these enrolled 87 patients 61 (70.11%) were male while 26 (29.88%) were females, giving a male to female ratio of 2.4:1.

On the basis of symptoms patients presented with abdominal pain were 71 (81.6%), with vomiting were 55 (63.2%), with bloody stool 87 (100%) and with fever 51 (58.6%)

Table 1

N=87		Frequency
Intussusception	<2 years	6 (85.7%)
	>2 years	1 (14.3%)
	Total	7 (100%)
Gender	Male	61 (70.11%)
	Female	26 (29.88%)
Symptoms	Abdominal pain	71 (81.6%)
	Vomiting	55 (63.2%)
	Bloody stool	87 (100%)
	Fever	51 (58.6%)
Previous history	Bloody diarrhea	17 (19.5%)
	Intussusception	3 (3.44%)

Out of these 87 patients 17 (19.5%) had previous episode of bloody diarrhea and 3 patients (3.44%) had previous history of intussusception as shown in Table No 1.

On stratification of data there was statistically significant correlation between intussusception and age of the patients (<2 years of age). There was no statistically significant correlation between intussusception and gender as shown in table no 2.

Table 2

N=87		Intussusception			p-value
		Yes	No	Total	
Gender	Male	5	56	61	0.93
	Female	2	24	26	
	Total	7	80	87	
Age	<2 years	6	63	69	0.02
	>2 years	1	17	18	
	Total	7	80	87	

DISCUSSION

Intussusception is a common acute illness among children presenting with bloody diarrhea. The study was aimed to determine the frequency of intussusception in children

presenting with bloody diarrhea which was 8.04% consistent with previously reported literature.

Approximately 5–10% cases of intussusceptions in pediatric patients were reported in a study conducted by Kopystecka et al which was similar to the findings of current study.¹¹ Emeka CK et al also reported similar frequencies of gastrointestinal symptoms in children with bloody diarrhea.¹²

In another study, children with intussusception was predominantly under 3 years of age where peak incidence was reported under 12 months of age. Male to female ratio was 2.24:1 which showed male predominance similar to our study¹³.

In children <2 years showed symptoms of bloody diarrhea, poor intake, vomiting and lethargy were common while in >2 years had high frequency of non-specific abdominal pain thus undiagnosed rate was high.¹⁷

Bloody diarrhea is a common presentation of intussusception as well as intestinal obstruction in early childhood. Bradshaw et al study showed that ultrasound was an accurate modality in emergency department and initial management was non-operative including fluid resuscitation antibiotics followed by air enema reduction under fluoroscopy guidance.¹⁴ A meta-analysis study

showed that ultrasound had sensitivity and specificity was 94.2% and 97.8% respectively. Early identification and timely intervention reduced the rate of complications such as bowel perforation and necrosis.¹⁵

Intussusception management includes both surgical and non-surgical methods. among them air enema had high success rate of 83% which was higher than hydrostatic reduction rate of 70%. Failure of reduction to these modalities, poor clinical condition such as shock and complicated intussusception laparoscopic reduction was performed.¹⁶

The finding of the current study showed that the young children presenting with bloody diarrhea, intussusception should be investigated with ultrasound. Prompt diagnosis can reduce rate of complications and decrease financial burden on poor socioeconomic families.

CONCLUSION

This study showed patient presenting with bloody diarrhea in early childhood intussusception should be considered among differentials and investigated, although it is not a common cause of intussusception but have a clinically significant impact on diagnosis in children presenting with bloody diarrhea.

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