

Childhood Intussusception: A Prospective Institutional Study at BPKIHS

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Abstract

Introduction: Intussusception is the commonest cause of bowel obstruction in infancy and childhood. The present study deals with the presentation, management and outcome of children presenting with intussusception at the Department of Surgery, B. P. Koirala Institute of Health Sciences, Dharan, Nepal.

Materials and Methods: Forty-seven children presenting at Department of Surgery, B. P. Koirala Institute of Health Sciences over a 5-year period were prospectively studied. **Results:** There were 27 (58.6%) males and 20 (41.4%) females, with male-to-female ratio of 1.4:1. The ages ranged from 2 months to 13 years, with a median age of 30 months. The mean duration of presentation was 10.7 ± 30.66 days (range 1-180 days). The triad of abdominal pain, bloody mucoid stools and palpable abdominal mass was seen in 10 (21%) of the cases. Surgical exploration was done in 42 (89.3%) patients. The commonest lead point was non-specific hyperplastic lymph nodes, occurring in 22 (54.3%), followed by idiopathic variety (16.6%), Meckel's diverticulum (9.5%), ileocaecal junction (7.1%), submucous lipoma (4.7%), Non-Hodgkin's lymphoma (4.7%), appendix (2.3%) and a mucosal polyp (2.3%). Overall mortality rate was 6.3%. **Conclusion:** The presenting age group and the time of presentation are higher than other studies. The mortality rate of 6.3% is comparable to other studies in the developing world. Earlier presentation could have avoided surgery, with a higher possibility of cases being managed conservatively.

Key words: Delayed diagnosis, intussusception, lead point

Introduction

Intussusception, a pathological telescoping of a portion of bowel into an adjacent part, is the commonest cause of intestinal obstruction in infants¹. It is usually due to lymphoid hyperplasia in infancy and early childhood, whereas in older children and adults it is usually secondary to some identifiable pathological lead points (PLPs) such as polyps, lipoma, and malignancies^{2,3}. Many past studies on childhood intussusception have been published mostly as case reports only⁴⁻⁷, we therefore ventured on this prospective study about the presentation and management outcome of childhood intussusception in an institute at Eastern Nepal.

Materials and methods

The medical records of all children presenting

with intussusception to the Department of Surgery, B. P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal from the year 2004 to 2009 was prospectively kept. Their clinical presentation, operative characteristics and management outcome were studied. Data was analyzed on SPSS 11.0 (Chicago, Illinois). Results were presented as mean \pm standard deviation for normally distributed variables and median for non-normally distributed variables.

Results

In this study there were a total of forty-seven children over the 5-year period. There were 27 (58.6%) males and 20 (41.4%) females, with male-to-female ratio of 1.4:1. The ages ranged from 2 months to 13 years,

with a mean age of 45.91±50.01 months. The median age was 30 months. The maximum number of children belonged to >4 years of age (14, 29.7%), followed by 2-6 months group (12, 25.5%) as shown in Fig. 1.

The mean duration of presentation was 10.7±30.66 days (range 1-180 days). Most (n=22) of the children (46.8%) presented in the duration of 2-5 days of onset of symptoms, followed by 14 children (29.7%) who presented before 2 days (Fig.2). Two children (4.2%) had chronic symptoms presenting even later than 1 month, they underwent a diagnostic laparoscopy after all the investigations failed to provide a diagnosis, in which intussusception was found.

The most common symptom was pain abdomen, detected by the history given by parents and described as episodes of crying with indrawing of the legs, occurring in 37 children (78.7%) (Fig.3). Distension and vomiting were next in frequency; tenderness was the most common sign found in 25 patients (53.19%). The other signs that were present were lump, dehydration and visible peristalsis. Twenty patients (42.5%) presented in shock and were dehydrated. The classical triad of abdominal pain, bloody mucoid stools, and a palpable abdominal mass was seen in 10 (21%) of the cases. In three patients (6.3%), the abdominal masses were also palpable per rectum. One (2.1%) patients presented with intestinal prolapse at the rectum.

Plain abdominal X-ray was obtained in all patients. Abdominal ultrasonography (USG) was performed in only 26 of the patients. Hydrostatic reduction was not attempted in this series. Surgical exploration was done in 42 (89.3%) patients. The remaining five patients

(10.6%) did not undergo surgical exploration because they resolved on conservative management. In three patients, spontaneous reduction of the intussusception occurred. In two patients reduction was done without resection because of healthy bowel and relatively innocuous cause, and in the rest 37 patients (78.72%), resection of the diseased bowel was done.

Regarding the location of intussusception, the commonest location was ileocolic in 29 patients (69.04%), followed by ileoileocolic in 4 (9.52%), ileoileal in 3, colocolic in 3 jejunojejunal in 2 and rectorectal in 1 patient (Table 1). The rectorectal intussusception was associated with gross dilatation of the sigmoid and rectum in a 5 year child with anterior ectopic anus, who had presented with chronic constipation.

Table 1: Showing location of intussuscep

SN.	Location	n=42	Percentage (%)
1	Ileocolic	29	69.04
2	Ileoileocolic	4	9.52
3	Ileoileal	3	7.36
4	Colocolic	3	7.36
5	Jejunojejunal	2	4.76
6	Rectorectal	1	2.38

Of the 42 operated cases, 22(52.3%) resulted from non-specific lymphadenitis (Peyer's patches); whereas Meckel's diverticulum occurred in 4(9.5%) and ileocecal junction formed the lead point in 3 (7.1%) cases each (Table 2). Other lead points included submucous lipoma (4.7%), Non-Hodgkin's lymphoma (4.7%), appendix (2.3%) and a mucosal polyp (2.3%). In 7 patients (16.6%), no obvious cause was found.

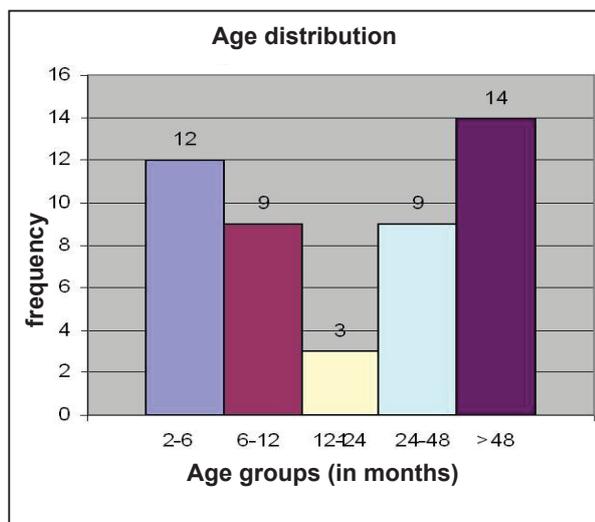


Fig 1: Age distribution of the children with intussusception

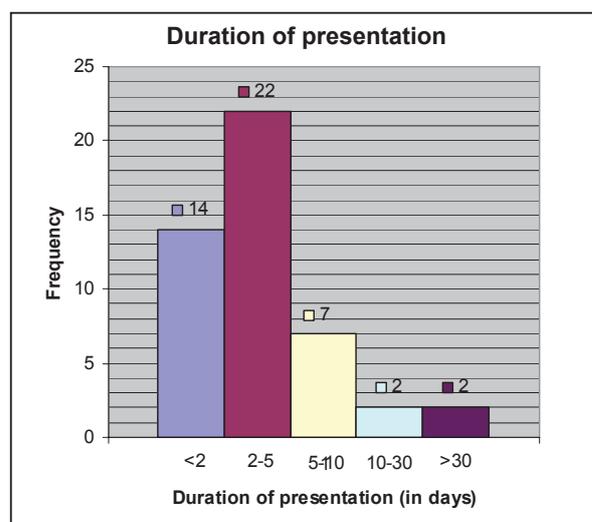


Fig 2: Duration of presentation of children with intussusception

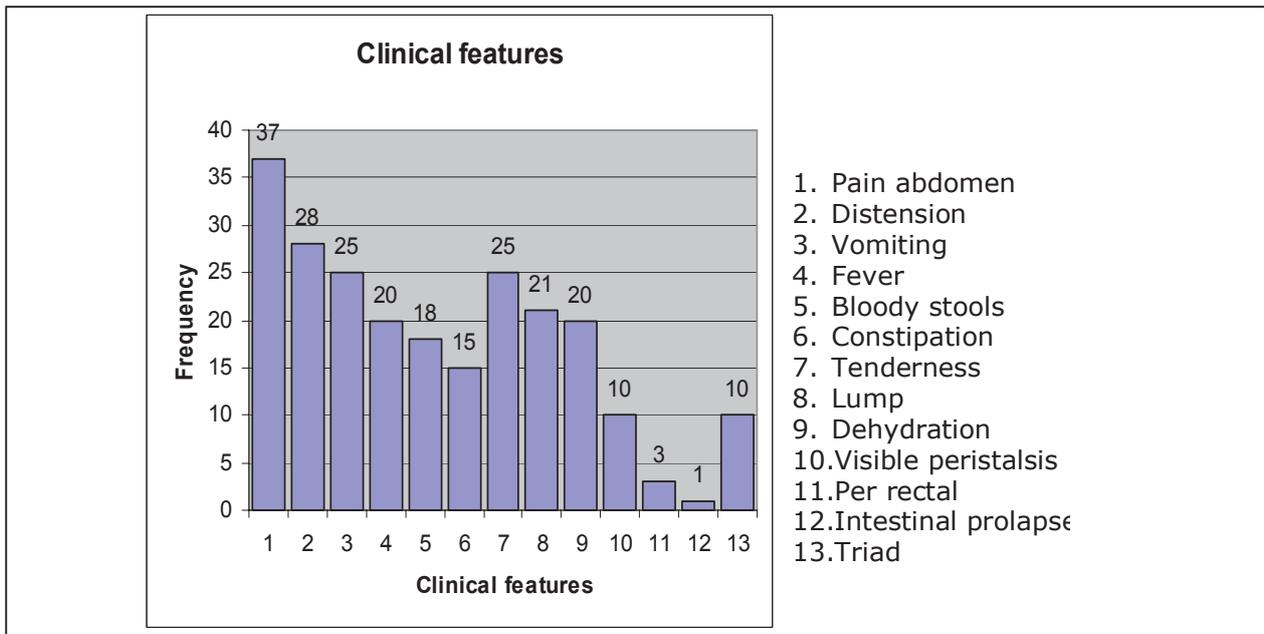


Fig 3: Clinical presentations of the children having intussusception

Table 2: Lead points of intussusception.

SN.	Pathology	n=42	Percentage (%)
1	Lymph node	22	52.3
2	Meckel's diverticulum	4	9.5
3	Ileocecal junction (mobile cecum)	3	7.1
4	Lipoma	2	4.7
5	NHL	2	4.7
6	Appendix	1	2.3
7	Mucosal polyp	1	2.3
8	Idiopathic	7	16.6

Pathological lead points (PLPs) were found in 10 (21.2%) patients. In primary intussusception, the mean age of presentation was 37.7±47 months, whereas in secondary intussusception (viz. secondary to PLPs), the mean age was 73±60.4 months. In 24 children aged less than 2 years, PLPs occurred in only 2(8.3%) children; among 23 children aged more than 2 years, PLPs occurred in 8(34.7%) children.

Wound infection was the commonest complication, occurring in 15 (35.7%) of all operated cases, burst abdomen was seen in 5(11.9%) of our cases and intraabdominal collection occurred in 4 (9.5%) children (Table 3). Postoperative pneumonia and seizures were seen in 4 (9.7%) and 3 (7.1%) patients respectively. Late complications seen in our patients were post-operative adhesive bowel obstruction in 3 (7.1%) children.

Duration of hospitalization ranged from 2 to 21 days, with a mean hospitalization period of 7.63 ± 3.45

Table 3: Postoperative complications.

SN.	Complications	n=42	Percentage (%)
1	Wound infection	15	35.7
2	Burst abdomen	5	11.9
3	Intraabdominal collection	4	9.5
4	Pneumonia	4	9.5
5	Seizures	3	7.1
6	Adhesive bowel obstruction	3	7.1
7	Anastomotic leak	3	7.1
8	Aspiration	1	2.3

days. Overall, 3 patients (6.3%) died. The causes of death were sepsis, aspiration and severe pneumonia. Recurrences were not found in conservatively managed cases during our follow-up. Follow-up period was 3 months to 3 years.

Discussion

Intussusception is the most common cause of acute bowel obstruction in infants and young children¹. It occurs when a more proximal portion of bowel, the intussusceptum, invaginates into more distal bowel, the intussusciens. This result in venous compression and bowel wall edema, eventually leading to bowel necrosis, perforation, and death if not treated in time. Children who develop intussusception are often less than 1 year of age, with a peak incidence between 4 and 7 months⁷, though there have been reports of intussusception occurring in the neonatal period as well⁸. Intussusception in Nepal has been limited to case reports only, and this is the first of study of this condition.

Children with intussusception often present with a wide range of nonspecific symptoms, including emesis, pain, irritability, and decreased appetite. The classical symptoms of emesis, pain abdomen, and bloody stools with or without a mass have been shown to be present in fewer than a quarter of children, making intussusception a difficult clinical diagnosis^{9,10}. The classic triad of colicky abdominal pain, vomiting and red currant jelly stools occurs in about one-fourths of cases^{9,10}. This triad occurred in 21% of our cases, which is comparable to study by Kaiser et al¹¹. Many of these cases were misdiagnosed as amebic or bacterial dysentery and sent back home on metronidazole and antibiotics. Probably this led to a delay in presentation to our institute.

Early diagnosis and treatment are crucial in the treatment of childhood intussusception, of which approximately 90–95% is idiopathic. As a possible cause, investigators have reported the involvement of mesenteric lymphoid hyperplasia due to viral infections such as adenovirus and rotavirus or to bacterial infections such as *Yersinia pseudotuberculosis* and *Staphylococcus aureus*¹². In infants aged 9-24 months, it is usually primary i.e. they do not have an identifiable specific lead point. A specific lead point is more commonly found in children older than 3 years of age¹³. The most common lead point in intussusception has been found to be the Meckel's diverticulum¹³⁻¹⁵. Other lead points that have been reported are polyps, duplication cyst, carcinoid, leiomyoma, hemangioma, fibrosarcoma and buried appendectomy stump¹³⁻¹⁵. It can also occur in association with a diffuse process including Henoch-Schonlein purpura, celiac disease, neutropenic colitis, cystic fibrosis, and Peutz-Jehgers syndrome¹³⁻¹⁵. In the present study, lymph nodes were the most common lead point, followed by idiopathic variety, Meckel's diverticulum, ileocecal junction, submucous lipoma, Non-Hodgkin's lymphoma, appendix and mucosal polyp. The incidence of PLPs in our study was 21.2%. In age < 2 years, PLPs occurred in only 2(8.3%) of children and in age > 2 years, they occurred in 8(34.7%) children, i.e., these lead points are more common in age group > 2 years. There is a major difference in the mean age of presentation between children presenting with primary intussusception and secondary intussusception as well, though this has not come as statistically significant. As in other previous studies, the most common location was the ileocolic region, followed by ileoileocolic, ileoileal, colocolic, rectorectal and jejunojunal intussusception. An unusual rectorectal intussusception was associated with chronic constipation in a 5-year child with anterior ectopic anus.

There have been 5 cases (10.6%) in which conservative management was successful without

recurrences. Regarding conservative management, barium and more recently air-contrasted, enemas have been the initial diagnostic and therapeutic study of choice¹¹. Publications report reduction rates of 70% to 80% on average, and ranging from 42% to 95%¹⁶. Children required surgical intervention more when the symptom duration exceeded 24 hours¹¹. However, in this study, we could not take into account the results of enema reduction, because there had been a delay in presentation to our institute, but we could presume that the cases that resolved on conservative management could have been reduced by barium or air. The mortality rate of 6.3% was however comparable to similar rates obtained from other workers in the developing world where rates of between 8 and 25% have been recorded¹⁷⁻²¹. Delayed presentation causing prolonged duration of symptoms and resulting in high morbidity and mortality in childhood intussusception has also been reported in these series. The duration of presentation in the present study is higher than in other studies; in which, it had been found to correlate with increased morbidity and mortality, but it might not always be the scenario, because intussusception is also known to be a transient phenomenon and a transient pathology in some cases, so the children may present with a chronic abdomen as well. In others, the delay originates mainly from misdiagnosis of this condition. Our study definitely has some drawbacks, like small number of cases; but these data may form a baseline in our part of the world to stimulate further studies.

Conclusion

The question always remains as to how to decrease the duration of presentation. Perhaps extensive efforts should be made to improve awareness about this entity by the first treating paediatrician/physician as well as at the parental levels to promote early presentation. Then we will also be able to establish the role of conservative management with hydrostatic, barium or air enema reduction, and may be the answer to this question may be found: are we doing unnecessary surgery for childhood intussusception?

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Conflict of Interest: None

Permission from IRB: Yes

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