

# Childhood Intussusception: Delayed Presentation and Surgical Outcome

Nandlal Kella, Prem Kumar Rathi, Bashir Ahmed Soomro and Muhammad Ali Qureshi

## ABSTRACT

**OBJECTIVE:** To compare the clinical presentation and surgical outcome in early versus delayed presentation of childhood intussusceptions.

**METHOD AND MATERIAL:** This comparative study was conducted in the Department of Pediatric Surgery, Liaquat University of Medical and Health Sciences Jamshoro/Hyderabad from January 2005 to July 2007. All the diagnosed patients of intussusception were categorized into early and delayed group (patient presented later than 24 hours from the onset of first symptom). Data regarding age, sex, clinical presentation, duration of presentation (early or late), surgical findings, treatment and complications were recorded on proforma. All patients of intussusceptions were subjected to laparotomy due to non-availability of image intensifier. Parameters including clinical presentations, surgical findings, treatment options and complications were analyzed with SPSS version 16.

**RESULTS:** This study was comprised of 80 patients; males 57(71.3%) and females 23(28.7%) with male: female ratio 2.5:1. Early presenting patients were 10 and delayed presenting were 70. Major clinical symptoms were pain in abdomen, vomiting and bleeding per rectum. Significant difference found in early and delayed presenting group was in bleeding per rectum ( $P<0.001$ ), mass per rectum ( $P=0.001$ ), mass per abdomen ( $P=0.029$ ), fever ( $P=0.006$ ) and abdominal distension ( $P=0.001$ ). Gangrene of bowel, complications and mortality were more common in delayed presenting group.

**CONCLUSION:** Pain in abdomen, diarrhea and vomiting were almost same in both groups, while distension of abdomen, palpable mass per rectum, bleeding per rectum, mass per abdomen, and fever had significant variability in both groups. There was also high morbidity in delayed presenting group. Early diagnosis and early treatment are main keys to curtail the morbidity and mortality in childhood intussusceptions.

**KEY WORDS:** Intussusception, early and delayed presentation, morbidity, difference.

## INTRODUCTION

Intussusception is a common cause of intestinal obstruction in pediatric age group.<sup>1</sup> Diagnosis of this condition is often difficult and might be hampered by variability of clinical presentation. Clinical features: pain in abdomen, vomiting, bleeding per rectum and palpable mass per abdomen might not be present at the time of presentation leading to delay in diagnosis.<sup>2</sup> When the time interval between the onset of first symptom and presentation of patient is more than 24 hours it is considered as delayed presentation and time period less than 24 hours is called as early presentation.<sup>3,4</sup> Reasons for late presentation are delay in diagnosis either by lack of awareness of disease or variability in symptoms and signs<sup>2</sup> and delay in arrival to hospital due to socio-economical problems.<sup>5</sup> Patients with delayed presentation may present as intestinal perforation, sepsis and occasionally prolapsed rectal mass. Delay presentation is one of the major factors for high morbidity and mortality in pediatric intussusception. Once the diagnosis of intussuscep-

tion is established surgical and non-surgical reduction (NSR) should be made.<sup>6</sup> NSR (barostatic and hydrostatic) are gold standard methods in developed countries where most of the patients present early. Non surgical reduction is not justified in delayed presentation, sepsis, peritonitis and intestinal perforation.<sup>7</sup> In developing countries NSR have been applied in early presenting patients with acceptable results where facilities are available.<sup>8</sup> In our set-up where most of the patients present late and facility of image intensifier was not available, all patients are subjected to laparotomy. We are sharing our experience with regard to clinical presentations and surgical outcome of early versus late presentation of childhood intussusception, so that early diagnosis and treatment should be made to reduce the morbidity and mortality.

## PATIENTS AND METHODS

This comparative study was conducted at Department of Pediatric Surgery, Liaquat University of Medical and Health Sciences Jamshoro/Hyderabad Pakistan

from January 2005 to June 2007 with age ranges two and half months to twelve years. In two and half year period 80 patients of intussusception were diagnosed on the basis of history and clinical examination, radiological investigations and further confirmed on surgical exploration. Data of all patients with regard to age, sex, clinical presentations, duration of presentation (early or late), surgical findings and treatment modality, complications and follow-up were recorded on pre-designed proforma. For the purpose of comparison cases were divided in two groups; early presenter (those reached to hospital earlier than 24 hours from onset of first symptom) and delayed presenter (reached after 24 hours from the onset of first symptom). Liaquat University Hospital is a tertiary care hospital with two campuses; city, where emergency surgeries are dealt and Jamshoro campus, where elective surgeries are performed. In city and Jamshoro campus we have no facilities of image intensifier, for that reason our all patients of intussusception are subjected to laparotomy. Intussusception with ischemic / gangrenous bowel had either resection anastomosis or stoma formation and with non-gangrenous bowel manual reduction had been applied. Patients with resection /anastomosis and manual reduction were followed-up for four weeks and with stoma formation followed till closure of stoma (6-12 weeks). Permission taken from ethical board and analysis of parameters; clinical presentations, surgical findings, treatment modalities and complications were done on SPSS software 16 version by applying Chi square test and Fisher's Exact test.

**RESULTS**

This study was comprised of 80 patients; males 57 (71.3%) and females 23 (28.7%) with male: female ratio 2.5:1. Total number of early presenting patients in this study was 10(12.5%) and late presenting was 70 (87.5%). Children under two years were 70 (85.7%); early group 8 and late group 62. Major symptoms in this study were pain in abdomen, vomiting and bleeding per rectum. **Table I** showing the clinical features in both groups with P values. Being a tertiary care hospital it received 66 (82.5%) patients from the rural area and only 14(17.5%) from urban area. Intussusception was reduced manually in 26(32.5%) patients [early group 9/10(90%) and delayed group 17/70(24.21%)] and 54 (67.5%) had gangrene bowel [early group 1/10(10%) and delayed group 53/70 (75.71%)]. Out of 54 patient with gangrene bowel 39 (38 from delayed group and 1 from early group) needed resection anastomosis and 15 had stoma formation (all from delayed group). **Table II** showing surgical findings and treatment modality in both groups. Types of intussusception in this study were ileocolic

(n=63,78.8%), out of 63, 8 (12.3%) from early group and 55(87.7%)from late group, ileoileal (n=10 ,12.6%) early 2(20%) and late group 8 (80%), and colocolic(n= 7,8.8%) were found only in late group. Complications occurred in 25 (31.2%) patients; late group was mainly affected and only 2 patients from early group had complications. **Table III** showing the percentage of complications. All complications were managed accordingly. Mortality in this study was in 3(3.7%) patients, all were from late group. Minimum hospital stay was 3 days and maximum up to two weeks.

**TABLE I:  
CLINICAL FEATURES OF INTUSSUSCEPTION IN EARLY AND DELAYED GROUPS**

Clinical feature	No. of patients	Early group (n=10)	Delayed group (n=70)	P value
Pain	63(78.8%)	7(70%)	56 (80%)	0.52
Vomiting	50(62.5%)	7(70%)	43(61.4%)	0.295
Bleeding per rectum	68(85%)	3(30%)	65(92.8%)	<0.001*
Mass per rectum	40(50%)	Nil	40(57.14%)	0.001*
Mass per abdomen	40(50%)	7(70%)	23(47.14%)	0.0029*
Diarrhea	25(31.3%)	1(10%)	24(34.2%)	<0.011*
Fever	41(51.3%)	1(10%)	40(57.1%)	<0.008*
Abdominal distension	50(62.5%)	1(10%)	49(70%)	0.001*

Note\* = Significant value

**TABLE II:  
SURGICAL FINDINGS AND TREATMENT MODALITIES IN EARLY AND DELAYED GROUP**

	No. of Patient	Early group (n=10)	Delayed group (n=70)	P value
Gangrene	54(67.5%)	1 (10%)	53(75.71%)	<0.001*
Manual reduction	26(32.5%)	9(90%)	17(24.28%)	0.001*
Resection/ anastomosis	39 (48.75%)	1(10%)	38 (54.28%)	0.001*
Stoma formation	15 (18.75%)	nil	15(21.42%)	0.001*
Complications	25(31.2%)	2(20%)	23(32.85%)	0.494

Note\*= significant value

**TABLE III:**  
**PERCENTAGE OF COMPLICATIONS IN EARLY AND DELAYED GROUP**

Complication	No. of Patient	Early group	Delayed group
Wound infection	07	1(14.2%)	6(85.8%)
Pneumonia	02	1(50%)	1(50%)
Incisional hernia	04	0	4(100%)
Post operative adhesion	03	0	3(100%)
Skin excoriation	05	0	5(100%)
Re –exploration	02	0	2(100%)
Mortality	03	0	3(100%)

## DISCUSSION

Intussusception is a typical cause of intestinal obstruction in infantile and pediatric age group and is frequently encountered in routine clinical practice. Classical clinical features of intussusception are pain in abdomen, vomiting, bleeding per rectum and palpable mass per abdomen. In most of the early presenting cases all the features are not present so diagnosis of intussusception remains a tricky problem for clinician<sup>2,9</sup>. Many cases are misdiagnosed as gastroenteritis or amebic dysentery when presenting with pain in abdomen and bleeding per rectum.<sup>5</sup> Unawareness of clinical condition, misdiagnosis and delayed referral are the main contributing factors for delayed presentation. Sometimes diagnosis has been made early by referral clinician but patients reached delayed due to financial problems in developing countries.<sup>5</sup> Occasionally parents also make delay in seeking medical advice. What ever the reasons of delayed presentation, it leads to high morbidity and mortality in childhood intussusception. In our study ten patients presented within 24 hours and seventy after 24 hours (2-7 days with mean duration of 3 days). In developed countries most of the patients reach within 24 hours<sup>10</sup>, while in third world countries delayed presentation is common problem<sup>11</sup>. With regard to clinical presentation pain in abdomen (70-80%) and vomiting (60-70%) were main features in our both groups, while other studies<sup>2,5</sup> showed 46% and 61% respectively. Bleeding per rectum was seen in 92.8% in delayed presenting group and 30% in early presenting group in our study, while Blanch et al<sup>2</sup> showed 46% bleeding in both groups and Bode<sup>5</sup> described that bleeding was an eminent feature (81%) in his study. Palpable mass per abdomen was a pertinent finding in early group (70%), while in late group it could be detected only in

50% of case in our study while, other study<sup>2</sup> showed 50% palpable mass in both early and late group. Khan<sup>9</sup> and Saleem<sup>12</sup> have reported the incidence of palpable mass per abdomen was 87.7% and 65% respectively. Palpable mass per rectum was found in 50% in late group which was not similar to Khan's study (7.4%). Distension of abdomen was seen in 70% patients in late group which is contrast to Blanch<sup>2</sup> description (20%) and consistent with Khan's statement (94.36%). Fever was significant in late group in our study which is similar to Mansur<sup>13</sup>. Common types of intussusception in both groups were ileocolic(78.8%) which is similar to other study<sup>14,15</sup> 76% and 77% respectively. It has been mentioned earlier that due to non availability of image intensifier our all patients were subjected to the laparotomy. Immediate surgery is indicated in unstable patients and in patients who have peritonitis or bowel perforation. Early surgical intervention may obviate the need of bowel resection in patient, thereby decreasing surgical morbidity<sup>16</sup>. Manual reduction was successful in 90% cases of early presenting group which was consistent with Shapkina<sup>10</sup> 86.1% and Ugwu<sup>17</sup> 70%. Late group showed manual reduction in 24.28% which was contrast to Mansur et al<sup>13</sup> report which was 34%. Gangrene of bowel occurred in 53/70 (75%) of cases in late group which was more than double 30-33% to other studies<sup>17,18</sup>. Sixty six percent gangrene of bowel was reported in Mansur<sup>13</sup> study in delayed presenting group. Resection and anastomosis was performed in 38/70(54.2%) patients and stoma formation in 15 (21.4%) patients only in late presenter group. Ameh et al<sup>19</sup> described in their study that complications were 54% in third world countries, which are higher 32.9% than our study in late presenting group. Mortality occurred in three patients (3.9%) in delayed presenting group which is not consistent with Edino<sup>20</sup> report (9.4%). Hospital stay was long in delayed presenting group and short in early group

## CONCLUSION

Being a common cause of intestinal obstruction pain in abdomen, diarrhea and vomiting are almost similar in both groups while bleeding per rectum, palpable mass per rectum, palpable mass per abdomen, fever and distension of abdomen had significant variability in both groups. There is high morbidity in delayed presenting group. Mortality only occurred in late presenting group. Early diagnosis and early treatment is the main keys to curtail the morbidity and mortality. It is also suggested to have arrangement for non-surgical reduction in early cases to lessen the problems.

## REFERENCES

1. Ikeda T, Koshinafa T, Inone K, Goto H, Sugiton K, Hagiwara N. Intussusception in children of school

- age. *Pediatr Int* 2007; 94(1):58-63.
2. Blanch AJ, Perel SB, Acworth JP. Pediatric intussusception: epidemiology and outcome. *Emerg Med Aust* 2007; 19(1):45-50.
  3. Kauser AD, Applegate KE, Ladd AP. Current success in the treatment of intussusception in children. *Surgery* 2007; 142(4):469-75.
  4. Crankson SJ, Al-Rabeeah AA, Fischer JD, Al-Jaddan SA, Namshan AA. Idiopathic intussusceptions in infancy and children. *Saudi Med J* 2003; 24(5): 18-20.
  5. Bode CO. Presentations and management outcome of childhood intussusception in Lagos. A prospective study. *Afr J Paeds Surg* 2008; 15(1):24-8.
  6. Bisset GS III, Kirsks DR. Intussusception in infants and children: diagnosis and therapy *Radiology* 1988; 168; 141-5.
  7. Ramachandran P, Gupta A, Vincent P, Sridharam S. Air enema for intussusception: Is the outcome important. *Pediatr Surg Int* 2008; 24(3):311-3.
  8. Gandapur ASK, Mohammad G, Awan FN, Tayyab M. Intussusception in infants and children. An analysis of 130 cases in Abbottabad and Hazara division. *J Ayub Med Coll Abottabad* 2000;12(1):16-8.
  9. Khan MJ, Khan K, Kaleem M, Khan MY, Maroof SA, Khan MT, et al. Prospective analysis of clinical presentation of children with diagnosed intussusception. *J Postgrad Med Inst* 2007:21(2):151-3.
  10. Shapkina AV, Shapkina VV, Nelubov IV, Pryanishena LT. Intussusception in children: 11 Years experience in Vladivostok. *Pediatr Surg Int* 2006; 22(10):901-4.
  11. Yang CM, Hsu HY, Tsoa PN. Recurrence of intussusception in childhood. *Acta Pediatr Taiwan* 2001;42:158-61.
  12. Saleem MM, Al-Momani H, Abu Khalaf M. Intussusception: Jordan University Hospital experience. *Hepatogastroenterology* 2008;55(85):1356-9.
  13. Mansur SH, Ahmed S, Rafi M, Shaikh A. Childhood intussusception. *Ann King Edward Med Coll* 2005;11(3):392-4.
  14. Grant HW, Buccinamazza I, Hadley GP. A comparison of colocolic and ileocolic intussusception. *J Pediatr Surg* 1996; 31(12): 167-70.
  15. Wiersma RD, Hadley GP. Minimizing surgery in complicated intussusceptions in the Third World. *Pediatr Surg Int* 2004; 20(3):215-7.
  16. Chua JH, Chu CH, Jacobson AS. Role of surgery in era of highly successful air enema reduction of intussusception. *Asian J Surg* 2006; 29(4):267-73.
  17. Ugwu BT, Legbo JN, Dakum NK, Yilyok SJ, Mbah N, Uba FA. Children intussusception; a 9 years review. *Ann Trop Pediatr* 2000; 20(2): 131-5.
  18. Kuremu RT. Childhood intussusception at the Moi teaching and referral hospital Eldoret: management challenge in a rural setting. *East Afr Med J*. 2004; 81(9): 44-6.
  19. Ameh EA. The morbidity and mortality of laparotomy of uncomplicated intussusception in children. *West Afr J Med* 2002; 21(2):115-6.
  20. Edino ST, Ochicha O, Mohd AZ, Anumah M. Intussusception in Kano: A five years analysis of pattern, morbidity and mortality. *Niger J Med* 2003, 12(4):221-4.



*AUTHOR AFFILIATION:*

**Dr. Nandlal Kella** (*Croessponding Author*)  
Assistant professor of Pediatric Surgery  
Liaquat University of Medical & Health Sciences  
(LUMHS), Jamshoro, Sindh-Pakistan.  
Email: nckella@yahoo.com

**Dr. Prem Kumar Rathi**  
Assistant Professor of General Surgery  
LUMHS, Jamshoro, Sindh-Pakistan.

**Dr. Bashir Ahmed Soomro**  
Assistant Professor of Pediatric Surgery  
Nawabshah Medical College, Nawabshah

**Dr. Muhammad Ali Qureshi**  
Resident Pediatric Surgery  
LUMHS, Jamshoro, Sindh-Pakistan.