

Intussusception in Children: A Short-Term Analysis in a Tertiary Care Hospital

NK Hazra¹, OB Karki^{1*}, M Verma¹, D Rijal¹, Abhijit De², B Nath³

¹Manipal College of Medical Sciences, Pokhara, Nepal

²Medical Officer, Kolkata, India

³Gardi Medical College, Ujjain, India

*Corresponding author: karki10@gmail.com

Received April 08, 2015; Revised April 29, 2015; Accepted June 16, 2015

Abstract In children especially in infancy and early childhood intussusception is a common cause of bowel obstruction. The pattern of clinical presentations in children and outcomes of intussusception management in low resource setup and to tackle the challenging problems in the management of problem were analyzed. From January 2012 to December 2014 the records of all children below 15 years of age who experienced intussusception were reviewed. All these children were managed and treated at Manipal Teaching Hospital, Pokhara in the Western Region of Nepal. Clinical outcomes were correlated with age, sex, clinical symptoms, diagnostics and treatment protocol and length of hospital stay. Total 26 children of intussusception were managed during the three years period (2011-2014) with male to female ratio of 1.6:1. The common symptoms were abdominal pain (62%) and bleeding per rectum (31%) and irritability (25%). Ileocolic intussusceptions (76%) was the commonest type of intussusception in this study and mesenteric lymph nodes (46%) and appendix (23%) were the common lead points. The patients who had undergone operative reduction stayed in the hospital longer than those who had not undergone operative procedure. Surgical site infection (23%), postoperative ileus (15%), pneumonia (11%) were the commonest complications. Lack of specialized facilities and trained personnel were main reason for nonsurgical reduction. Intussusception cases usually reported late, therefore, operative procedure was the main treatment modality in the present hospital setup.

Keywords: Intussusception, Lead Point Pathology, Western Nepal

Cite This Article: NK Hazra, OB Karki, M Verma, D Rijal, Abhijit De, and B Nath, "Intussusception in Children: A Short-Term Analysis in a Tertiary Care Hospital." *American Journal of Public Health Research*, vol. 3, no. 4A (2015): 53-56. doi: 10.12691/ajphr-3-4A-11.

1. Introduction

The term "intussusception" is defined when one portion of the gut becomes invaginated with another immediately adjacent to it. The commonest being the ileocolic type. [1]. In infants and young children it is common cause for obstruction of bowel. Most of these intussusceptions are considered idiopathic in origin. But several pathogenic organisms and viruses including adenovirus, post vaccination for polio are known to be associated with this condition [2,3]. The peak age of presentation is 4 to 8 months when weaning is started. In infancy and early childhood usual reason is lymphoid hyperplasia, but in grown up children and adults the cause is some lead point pathogenic conditions like Polyps, Lipoma, Malignancies, Meckel's diverticulum etc. [3]. Intussusception is usually an acute emergency, if unrelieved, the blood supply at the obstructive point of intestine is impaired, and ultimately necrosis, gangrene, perforation and general peritonitis set in [4,5]. In less than 25 percent children the clinical symptoms are emesis, pain, and stool mixed with blood or sometimes with a mass thus clinical diagnosis of

intussusception becomes difficult [6,7]. Recent advances, such as ultrasound, barium-enema and CT scan help in evaluation of patient with intussusception with early recognition and treatment. In developed countries children experience a favorable clinical outcome because of early diagnosis and treatment with the less invasive procedure of enema reduction. In developing countries primarily the treatment of intussusception is operative management i.e. laparotomy and reduction (Figure 1) Radiologic reductions of intussusception decrease the length of hospitalization, recovery time, and reduce the complications associated with major abdominal surgery [8,9].



Figure 1. Open Reduction of Intussusception

It is assumed that the delayed diagnosis of intussusception increases the incidence of surgical treatment and the risk of complications.

The aim was to study, the pattern, clinical presentations and management outcomes of childhood intussusception in Manipal Teaching Hospital which is a tertiary care hospital in Western Region of Nepal. Also to scrutinize the problems in the management of this disease in the present set up and to form a basis for future research and improvement.

2. Methodology

This was a retrospective descriptive study conducted in department of Surgery, Manipal Teaching Hospital, Pokhara, Nepal among patients aged below 15 years, diagnosed as intussusception between the years January 2012 to December 2014. The diagnosis of intussusception was made based on the clinical features, radiological investigation and operative findings. All the patients had intravenous fluids to correct fluid and electrolyte imbalance. Nasogastric suction; urethral catheterization were instilled and broad-spectrum antibiotic coverage was given to all.

Inclusion Criteria: The verified diagnosis of intussusceptions in patients by imaging (ultrasound, enema, and/or computed tomography (CT) or surgical exploration.

Exclusion Criteria: Patients were excluded if the diagnosis of intussusceptions was not validated or patients who were above 15 years of age.

Retrospective analysis was done based on the medical records of the patients managed with intussusceptions.

Prior to the study, approval was obtained from the Ethics committee of the Manipal Teaching Hospital to conduct the study. The database includes demographic data, clinical presentation and their duration, hospital admission dates, diagnostic and treatment procedures, and status at the time of discharge or death in hospital.

Though few cases presented early, fluoroscopic facilities was not available at that time, so barium enema or hydrostatic reduction was not available in out hospital so hydrostatic reduction was not tried in any of the cases.

Sample size calculation: In a pilot study done prior to the study with 10 patients showed expected Proportion of

Ileocolic intussusception was 0.8, Precision (%) = 16, and Desired confidence level (%) = 95. Required sample size was 24 [10].

The demographic characteristics of patients were presented using descriptive statistics. The statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 16.0 (SPSS, Chicago IL, U.S.A) and Microsoft Windows.

3. Results

Twenty six patients were included in the study who fulfilled the inclusion and exclusion criteria in the study period of four years. Male to female ratio was 1.6:1. The mean age of presentation was 1.75 years and 46% of children were below one year of age. 35% between 1-5 yrs of age (Table 1).

Table 1. Distribution of Patients by Age (N=26)

Age Group(years)	Number of patients	Percentage
< 1	12	46
1-5	9	35
5-10	4	15
10-15	1	4

Patients with intussusception in this series presented with a number of symptoms (Table 2).

Abdominal pain (73%), vomiting (42%), per rectal bleeding (382%) were common symptoms.

Table 2. Mode of Presentation of Patients (N=26)

Presenting feature	Number of patients	Percentage
Abdominal pain	19	73
Vomiting	11	42
Bleeding per Rectum	10	38
Irritability	7	27
Abdominal Distension	5	19
Diarrhea	3	12
Constipation	3	12
Anastomotic Breakdown	1	4

Ileo-colic intussusceptions was the commonest type of intussusception in our study and it accounted for 76% of the cases. Other types were ileoileal, ileileocolic, colocolic. (Figure 2).

Retrograde type of intussusception was not seen in our study. Iileo-ileal intussusception in sac of obstructed umbilical hernia was encountered in one patient in our series.

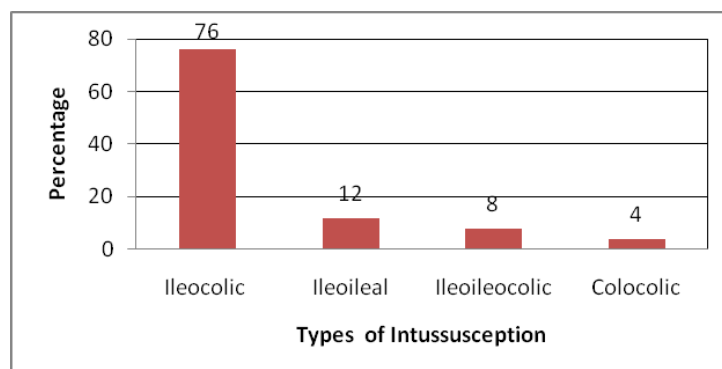


Figure 2. Types of Intussusception

The cause of intussusceptions was unknown in 46%. Other common causes were enlarged mesenteric lymphnodes (23%) and appendix (19%). Submucosal

lipoma and Meckel's diverticulum were noticed in 4% each of the intussusceptions in children in our study. (Figure 3).

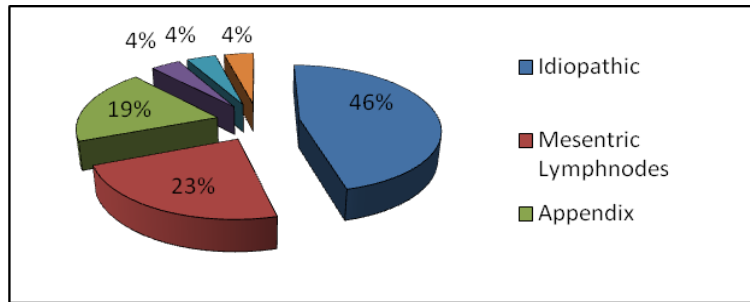


Figure 3. Different Types of Lead Points of Intussusception

Table 3. Management of Patients with Intussusception

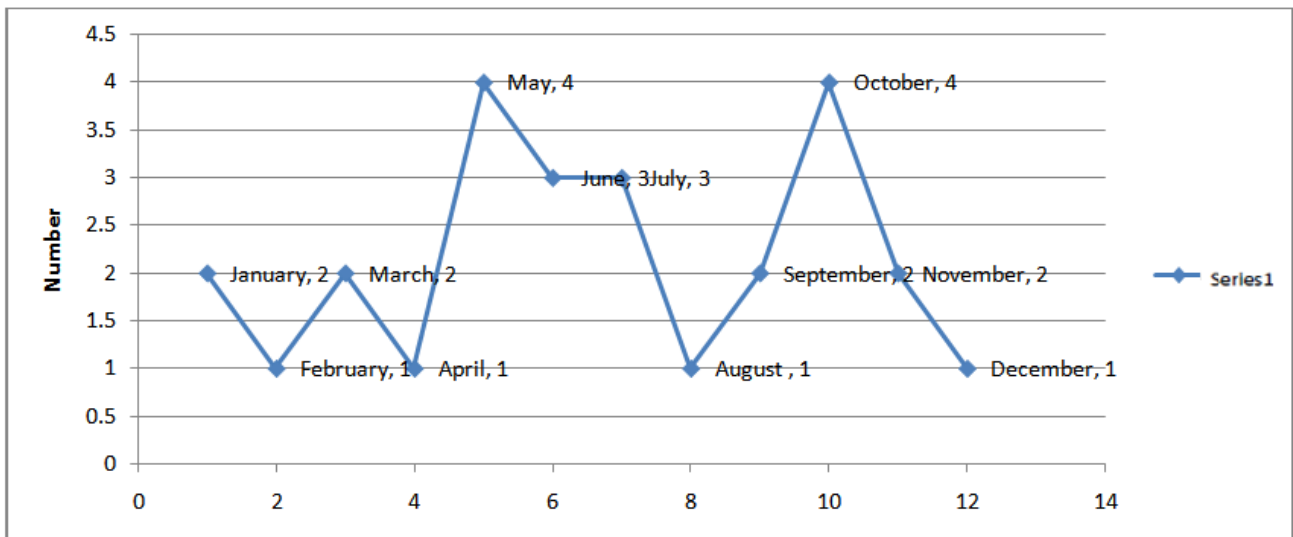
Management	Number of patients	Percentage
Reduction with Appendectomy and Ileocecopexy	18	69
Conservative	3	11
Resection Anastomosis	2	8
Reduction	2	8
Enterorrhaphy	1	4

Reduction of intussusception with appendectomy and ileocecopexy was the commonest (69%) operative procedure performed followed by just reduction of intussusception (8%) and resection-anastomosis (8%) and

enterorrhaphy (4%). Conservative management was done in 11% of patients (Table 3).

The mean duration of presentation to hospital after onset of symptoms was 2.04 days but few patients presented as late as four days. Surgical Site Infection (23%) was the commonest complication, followed up by postoperative ileus (15%), Pneumonia (11%), intra-abdominal abscess (7%). Mortality rate in our study was 8%.

Duration of hospitalization ranged from 3 to 15 days, with a mean hospital stay of 7.63 days. Follow up of patients was generally poor. More cases of intussusceptions were seen in the month of May-June and October- November (Graph 1).



Graph 1. Seasonal Variation of Intussusception Cases

4. Discussions

Intussusception is the most common cause of acute bowel obstruction in infants and young children with peak incidence between 3 and 18 months which may coincide the change from breast to cow’s milk feeding (often a time for heightened allergic response). [1,2,11]. Children with intussusception often present with various nonspecific symptoms. The classical symptoms of pain abdomen, vomiting, and bloody stools with or without a mass have been shown to be present in fewer than a quarter of children [7,13]. The classic triad of colicky abdominal pain, vomiting and red currant jelly stools occurred in 28% of our cases, which is comparable to studies in BPKIHSD haran, Nepal by Shakya et al [13]. Intestinal lymphoid hyperplasia following viral infection can be

implicated in the etiology of intussusception and that could be the reason for seasonal increase in incidence [9,14,15] Other lead points include polyps, duplication cyst, carcinoid, lipoma, leiomyoma, appendix, Meckel’s diverticulum and buried appendectomy stump [7,9,11,13,15]. It can also occur in association with Henoch- SchonleinPurpura, Celiac disease, neutropenic colitis, cystic fibrosis, and Peutz-Jehgers syndrome [8,15].

Seasonal variations in the occurrence of intussusception remain controversial; while some workers have reported some variations [16]. Others have noted no variation [17].

Barium and more recently air-contrast, enemas have been the initial diagnostic and therapeutic study of choice but in our study such method was not tried in any patients due to lack of expertise and facility.

5. Conclusion

Intussusception is a common childhood surgical emergency. However, most cases present late. Late presentations may arise mainly from ignorance, poverty and poor access to tertiary health care. Lack of trained personnel and specialized facilities for non-operative reduction are compelling reasons for surgical intervention at most hospitals of developing countries. Early referral, presentation and evaluation of patients are the key to prevent the morbidity and mortality due to intussusceptions. In future employment of skilled personnel for non-operative reduction and provision of specialized facilities in the hospitals will result in timely management of intussusception in pediatric age groups in a low resource country like Nepal. The study may form a base line data to stimulate future research on the subject.

Limitations of the Study

Small number of cases and non use of hydrostatic method of reduction were the main limitations.

Declaration of Conflicting Interests

The authors declare that there is no potential conflicts of interest with respect to the research, authorship and /or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

References

- [1] DiFiore JW. Intussusception. *Semin PediatrSurg.* 1999; 8: 214-20.
- [2] Doi O, Aoyama K, Hutson JM. Twenty-one cases of small bowel intussusception: the pathophysiology of idiopathic intussusception and the concept of benign small bowel intussusception. *Pediatr SurgInt.* 2004; 20: 140-3.
- [3] Murphy TV, Gargiullo PM, Massoudi MS, Nelson DB, Jumaan AO, Okoro CA, et al. Intussusception among infants given an oral rotavirus vaccine. *N Engl J Med.* 2001; 344: 564-572.
- [4] Ameh EA. The morbidity and mortality of laparotomy for uncomplicated intussusception in children. *West Afr J Med* 2002; 21: 115-6.
- [5] Ugwu BT, Legbo JN, Dakum NK, Yiltok SJ, Mbah N, Uba FA. Childhood intussusception: a 9-year review. *Ann Trop Pediatr.* 2000; 20: 131-5.
- [6] Bines JE, Ivanoff B, Justice F, Mulholland K: Clinical case definition for the diagnosis of acute intussusception. *J Pediatr Gastroenterol Nutr.* 2004, 39: 511-8.
- [7] ai AHM, Phua KB, Teo E: Intussusception: a three-year review. *Ann Acad Med Singapore.* 2002, 31: 81-5.
- [8] Johnson B, Gargiullo P, Murphy TV, Parashar UD, Patel MM: Factors associated with bowel resection among infants with intussusception in the United States. *Pediatr Emerg Care.* 2012; 28: 529-532.
- [9] Abbas, T.O., et al. Retrospective Surveillance over 11 Years for Intussusception in Children Younger than 14 Years in the State of Qatar. *Open Journal of Pediatrics.* 2014; 4, 1-11.
- [10] Sathian B, Sreedharan J, Baboo NS, Sharan K, Abhilash ES, Rajesh E. Relevance of Sample Size Determination in Medical Research. *Nepal Journal of Epidemiology* 2010; 1 (1): 4-10.
- [11] Fischer TK, Bihmann K, Perch M, et al. Intussusception in early childhood: a cohort study of 1.7 million children. *Pediatrics.* 2004; 114: 782-5.
- [12] Kaiser AD, Applegate KE, Ladd AP. Current success in the treatment of intussusception in children. *Surgery.* 2007; 142: 469-77.
- [13] Shakya VC, Agrawal CS, Sinha AK, Bhatta NK, Khania S, AdhikaryS. Childhood Intussusception: A Prospective Institutional Study at BPKIHS. *J Nepal PaedrSoc.* 2011; 31 (1): 6-10.
- [14] Doi O, Aoyama K, Hutson JM. Twenty-one cases of small bowel intussusception: the pathophysiology of idiopathic intussusception and the concept of benign small bowel intussusception. *PediatrSurgInt.* 2004; 20: 140-3.
- [15] Ong NT, Beasley SW. The lead point in intussusception. *J PediatrSurg.* 1990; 25: 640-3.
- [16] Chen SC, Wang JD, Hsu HY, Leong MM, Tok, TS. and Chin, YY. Epidemiology of Childhood Intussusception and Determinants of Recurrence and Operation: Analysis of National Health Insurance Data between 1998 and 2007 in Taiwan. *Pediatrics & Neonatology.* 2010; 51: 285-291.
- [17] HO WL, Yang TW, Chi WC, Chang HJ, Huang LM, Chang MH. Intussusception in Taiwanese Children: Analysis of Incidence, Length of Hospitalization and Hospital Costs in Different Age Groups. *Journal of the Formosan Medical Association.* 2005; 104: 398-401.