



RESEARCH ARTICLE

CHILDHOOD INTUSSUSCEPTION, INTERVENTIONAL STUDY

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ABSTRACT

Background: Intussusception occurs when a portion of the alimentary tract is telescoped into an adjacent segment. It is the most common cause of intestinal obstruction between 5 months and 3 years of age. Most cases are idiopathic. **Aim of study:** To study the epidemiology and clinical manifestations of intussusception and the relation between age and residency with time of presentation and mode of management, and to find out the impact of delay in presentation on the outcome. **Patients & methods:** A prospective study was performed on 35 patients that were presented with signs and symptoms consistent with intussusception and admitted to the emergency unit and pediatrics surgical ward in Child's Central Teaching Hospital in Baghdad during a period of seven months from the first of July 2016 to the 31st of January 2017. The age range was between 2 months to 3 years. History was taken and examinations, plain x-ray of abdomen, ultrasound of abdomen was done. The diagnosis was made clinically and confirmed by ultrasound. Patients treated either by pneumatic reduction under ultrasound guidance or surgically. Pneumatic reduction was attempted in all patients excluding those older than 2 years, presentation after 72 hours, poor general condition with signs of small bowel obstruction, and patients with shock or peritonitis. Intraoperative notes were collected looking for data regarding the mode of management, the type of intussusception and complications. **Results:** Peak age was between 6-12 months (60%), male affected more than female with male: female ratio of 1.7:1. Most patients (68%) were presented after 24 hours; most patients from rural areas (82%) were presented lately after more than 24 hours. The most presenting features were screaming attack (94.3%), bloody stool (91.4%) and vomiting (80%). Twenty one patients (60%) had palpable abdominal mass and red currant jelly stool was found in 28 patients (80%) on examination. Pneumatic reduction was attempted in 22 cases, success rate was 77%. Pneumatic reduction was most successful in patients aged between 6-12 months (80%) and those presented early less than 24 hours (90%). Nine patients (81%) with duration of symptoms of less than 24 hours were treated by pneumatic reduction, while 11 patients (91.7%) with duration of symptoms of more than 48 hours were managed surgically (8 patients by surgical reduction and 3 patients by bowel resection). Two cases had bowel perforation, one of them was associated with bowel ischemia, and both of them were presented after 48 hours. **Conclusion:** The most important predictor of the outcome is duration of symptoms. Delayed diagnosis increases the risk of failure of pneumatic reduction and increases the probability of surgical intervention and resection of bowel. The delay in presentation is due to the variability of signs and symptoms, seeking medical advice from non-specialized individuals, misdiagnosis of intussusception and delayed referral.

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INTRODUCTION

Intussusception occurs when a portion of the alimentary tract is telescoped into an adjacent segment. It is the most common cause of intestinal obstruction between 5 months and 3 years of age (Kennedy *et al.*, 2016). The classic symptoms in an infant or a young child are intermittent, crampy abdominal pain with 'currant jelly' stools and a palpable mass on physical examination (Kaiser). Children with intussusception look pale and lethargic, except when they are aroused by a spasm of severe pain.

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A sausage shaped mass is palpable in more than half the infants. Clinical history and physical examination are usually sufficient for diagnosis (Maki *et al.*, 2014; Sigmund, 2006). When the diagnosis is unclear at presentation, abdominal ultrasound or abdominal plain films is needed (Surgery, 2007). Any child suspected of having intussusceptions is considered to be in emergency (Clive Quick, 2007). The treatment is started after stabilizing the patient with supportive measures (Kitagawa, 2016; Spitz, 2007; Tareen *et al.*, 2011). An air or contrast enema is the first-line treatment as long as there are no contraindications to non-operative reduction. An operation is needed when non operative reduction is unsuccessful or incomplete, for signs of peritonitis, the presence of a lead point, or radiographic evidence of pneumoperitoneum (Carachi, 2013).

Aim of Study

- To study the epidemiology and clinical manifestations of intussusception.
- To study the relation between age and residency with time of presentation and mode of management of intussusceptions.
- To find out the impact of delay in presentation on the outcome.

MATERIALS AND METHODS

This prospective study was performed on 35 patients that were presented with signs and symptoms consistent with intussusception and admitted to the emergency unit and the pediatrics surgery ward in Child's Central Teaching Hospital in Baghdad during a period of 7 months from the first of July 2016 to the 31st of January 2017. The age range was between 2 months to 3 years, divided into 4 subgroups (<6 months, 6-12 months, >12-24 months, >24 months). A full history was taken from their parents regarding their name, age, sex, residency (urban or rural), duration of illness before admission and clinical presentation (bloody stool, abdominal pain {screaming attack}, vomiting, fever, abdominal distension, lethargy and anal prolapse). A full systemic examination was done including abdominal examination looking for palpable abdominal mass, abdominal distension and tenderness and digital rectal examination to look for bloody mucus (the currant jelly stool). All patients were sent for erect plain x-ray of the abdomen; ultrasound of the abdomen, and laboratory investigations (WBC count, renal function test and serum electrolytes), barium enema was not done due to the lack of facilities. Pneumatic reduction was attempted in 22 patients. Patients older than 2 years, presentation after 72 hours, poor general condition with signs of small bowel obstruction on x-ray and patients with shock or peritonitis were excluded from Pneumatic reduction (Tareen *et al.*, 2011). Intraoperative notes were collected looking for data regarding the mode of management (pneumatic reduction, manual reduction, bowel resection with anastomosis), the type of intussusception, the presence of pathological lead point and complications. Data was analyzed using Pearson Chi-square test to assess the significance of differences. Level of significance of ≤ 0.05 was considered as significant.

RESULTS AND DISCUSSION

Age, gender and residency: The majority of patients (60%) were between ages 6-12 months, 10 patients (28%) were younger than 6 months and only 2 patients (5.7%) were older than 2 years, as shown in table (1). Twenty-two patients (62%) were male while only 13 patients (37%) were female, with a male: female ratio of 1.7:1. Eighteen patients (51.5%) were from urban areas, and 17 patients (48.5%) were from rural areas.

Duration of symptoms: As shown in table 2, twelve patients (34.3%) admitted to hospital more than 48 hours after onset of symptoms, the same number of patients (34.3%) presented between 24-48 hours, 9 patients (25%) sought medical attention within 12-24 hours while only 2 patients (5.7%) were admitted during a period of less than 12 hours.

Table 1. The age, gender and residency distribution of children with intussusceptions

Age	No. of patients	Percentage
< 6 months	10	28.6
6-12 months	21	60.0
>12-24 months	2	5.7
>24 months	2	5.7
Total	35	100.0
Sex		
Male	22	62.9
Female	13	37.1
Total	35	100.0
Residency		
Rural	17	48.5
Urban	18	51.5
Total	35	100.0

Table 2. The duration of symptoms of patients with intussusceptions before admission

Time	Frequency	Percentage
<12 hours	2	5.7
12-24 hours	9	25.7
>24-48 hours	12	34.3
>48 hours	12	34.3
Total	35	100.0

Table 3. Residency in relation to duration of symptoms

	Residency	Duration of symptoms			Total
		<24hrs	24-48hrs	>48hrs	
	urban	8 (44.4%)	5 (27.7%)	5 (27.7%)	18 (100%)
	rural	3 (17.6%)	7 (41.1%)	7 (41.1%)	17 (100%)
	Total	11 (31.4%)	12 (34.3%)	12 (34.3%)	35 (100.0%)

$p=0.025$, significant relation.

Table 4. The clinical manifestations of children with intussusceptions

Clinical presentation	Number of patients	%
Screaming attack (abdominal pain)	33	94.3%
Bloody stools	32	91.4%
Vomiting	28	80.0%
Fever	16	54.3%
Abdominal distention	15	42.9%
Abdominal tenderness	9	25.7%
Prolapse of intussusception through the anus	4	11.4%
Abdominal mass	21	60.0%
Lethargy	14	40.0%

Table 5. Age of patients in relation to pneumatic outcome

Age group		Pneumatic outcome		Number of patients with attempted pneumatic Reduction
		Successful	Failure	
Age group	<6m	3 (60%)	2 (40%)	5 (100%)
	6-12 m.	12 (80%)	3 (20%)	15 (100%)
	>12-24m.	2 (100%)	0 (0%)	2 (100%)
Total		17 (77.3%)	5 (22.7%)	22 (100.0%)

$P = 0.472$, no significant relation.

Table 3 shows that 44.4% of patients from urban areas were presented early within 24 hours while 82% of patients from rural areas were presented more than 24 hours after onset of symptoms which is found to be statistically significant ($P=0.025$).

Table 6. Duration of symptoms in relation to mode of management

			Mode of management		Total	
			pneumatic reduction	surgical reduction	Surgical resection	
Duration of symptoms	<24 Hrs.	Number	9	0	2	11
		%	81.8%	0%	18.2%	100.0%
	24-48 hrs.	Number	7	3	2	12
		%	58.3%	25.0%	16.7%	100.0%
	>48 hrs.	Number	1	8	3	12
		%	8.3%	66.7%	25.0%	100.0%
Total		Number	17	11	7	35
		%	48.6%	31.4%	20.0%	100.0%

P = 0.004, significant relation using Pearson Chi- square test at 0.05 level of significance.

Table 7. Duration of illness in relation to complication

			Complications (Perforation, (ischemia)	No complication	Total
Duration of illness	<48 hrs.	No.	0	23	23
		%	.0%	100.0%	100.0%
	>48 hrs.	No.	2	10	12
		%	16.7%	83.3%	100.0%
Total		No.	2	33	35
		%	5.7%	94.3%	100.0%

P = 0.045, significant relation

All patients improved, no patient died in this study group.

Clinical manifestation: As shown in table 4, most patients presented with screaming attack (94.3%), bloody stool (91.4%) and vomiting (80%), while fever (54%), lethargy (40%), abdominal distension (42%) and anal prolapse (11%) were presented less frequently in this study group.

Management: As shown in table 5, pneumatic reduction was attempted in 22 cases. It was successful in 17 patients (77.3%) while the procedure failed in 5 patients (22.7%). Comparing the age of patients with the success of the procedure, the results were statistically not significant. As shown in table 6, most patients (81%) with duration of symptoms of less than 24 hours were treated by pneumatic reduction, seven patients (58%) presented between 24-48 hours were managed successfully by pneumatic reduction while most patients (91.7%) with duration of symptoms of more than 48 hours were managed surgically {8 patients (66.7%) by surgical reduction and 3 patients (25%) needed bowel resection}. These results were found statistically significant (P=0.004). Bowel resection in this study group was done due to multiple reasons which include failure of manual reduction, perforation during surgical reduction, finding of pathological lead point or gangrenous bowel.

Complications: As shown in table 7, two cases had bowel perforation, one of them was associated with bowel ischemia, both of them were presented after 48 hours, aged younger than 6 months and managed by surgical resection and anastomosis.

This result was found to be statistically significant. All patients improved, no patient died in this study group.

Conclusion

- Intussusception is more common in age group between 6 months to 1 year.
- Intussusception is more common in boys than girls.
- Abdominal pain (screaming attack), bloody stool and vomiting are the commonest presenting symptoms and the characteristics red currant jelly stool and sausage shaped mass are not presented all the time.
- High index of suspicion is important for early diagnosis of intussusceptions, giving special attention to patients younger than 6 months who may have greater risk of undergoing surgery and rapid progression to ischemia and perforation, also giving special attention to the presence of bloody stool in patients younger than 1 years or the development of vomiting in patients between 13 -24 months.
- The most important predictor of the outcome is duration of symptoms. Delayed diagnosis increases the risk of failure of pneumatic reduction and increase the probability of surgical intervention and resection of bowel; hence it increases the likelihood of developing complications.
- The delay in presentation is due to the variability of signs and symptoms, seeking medical advice from non-

specialized individuals (medical sub staffs and local pharmacists), misdiagnosis of intussusception for gastroenteritis and viral infection and delayed referral from primary care givers. Living in rural areas also is related to delayed presentation.

REFERENCES

- Alehossein M. 2011. Comparison of different modalities for reducing childhood intussusception. *Iranian journal of radiology*. 8: 83-87.
- Alhasani A.A. 2016. Assessment of intraoperative manual reduction of intussusception in children. *Basrah journal of surgery*. 22: 69-72.
- Alkhalidi, J.N. 2003. Intussusceptions in childhood: a study of 32 cases in Mosul. A thesis submitted to Iraqi Council for medical specialization in pediatric.
- Carachi R., Agarwala S., Bradnock TJ. 2013. Basic techniques in pediatrics surgery. Verlag Berlin Heidelberg: Springer., 303-306.
- Clive Quick. Acute surgical problem in children. In: Philip J. Deakin. Essential surgery. fourth edition. Elsevier; 2007. 742-43.
- Fragoso AC., Campos M., Tavares C. et al. 2007. Pneumatic reduction of childhood intussusception. Is prediction of failure important?. *J. ped. surg.*, 42: 1505-1508.
- Gata H. A., Ejriah A.A. 2016. The role of ultra Sound in diagnosis of intussusceptions in children in Baghdad 2012_2013. *Medical Journal of Babylon.*, 13: 85 - 94.
- Hameed I, M. 2012. Childhood Intussusception: A Study of 55 Cases in Baghdad. A thesis submitted to Iraqi Council for medical specialization in pediatric. Baghdad.
- Kaiser AD., Applegate KE., Ladd AP. 2007. Current success in the treatment of intussusception in children. *Surgery j.*, 142:469-77.
- Kennedy, M., Liacouras, AC. 2016. Ileus, Adhesions, Intussusception, and closed loop obstruction. In: kliegman MR, Stanton FB, Schor FN, et al. Nelson textbook of pediatrics. 20th edition. Philadelphia: Elsevier Inc.; 333.3. 1812-1814.
- Khalaf, O.A. 2010. A study of thirty-six cases of intussusceptions in al-khansaa teaching hospital in Mosul. A thesis submitted to Iraqi Council for medical specialization in pediatric.
- Khorana, J., Singhavejsakul J., Ukarapol N. et al. 2015. Enema reduction of intussusception: the success rate of hydrostatic and pneumatic reduction. *J therapeutic and clinical risk management*. 11: 1837-1842.
- Kitagawa MD., Miqdady Md. Intussusception in children. Up to date online 16.1. Available on <http://www.uptodate.com/contents/intussusception-in-children>. Last updated: Mar 30, 2016.
- Maki CA., Fallat EM. 2014. Intussusception. In: Holcomb G, Murphy JP, Ostlie D et al. 2014. Ashcraft's Pediatric Surgery. 6th edition. Philadelphia: Elsevier Inc. 38. 531-538.
- Ogundoyin O. 2015. Childhood intussusception: A prospective study of management trend in a developing country. *African j pediatric surgery*, 12: 217-220.
- Sigmund H. Einad. Intussusceptions. In: O'Neill J, Grosfeld J, Coran A. Pediatric surgery. Sixth edition. Saunders; 2006. 1313-1337.
- Spitz L, Suqarman ID. Pediatric surgery. In: Keik RM, Winslet MC. Essential general surgical operation. 2nd edition. Elsevier; 2007. 351.
- Tagbo B. N., Mwenda J., Eke C te al. 2014. Retrospective Evaluation of Intussusception in Under-Five Children in Nigeria. *World journal of vaccines*. 4: 123-132.
- Tang B. 2016. Pneumatic reduction of paediatrics intussusception: Clinical experience and factors affecting outcome. *Hong Kong J radiol.*, 19:200-7.
- Tareen F, Ryan S, Avanzini S, et al. Does the length of the history influence the outcome of pneumatic reduction of intussusceptions in children? *Pediatr Surg Int*. 2011; 27:587-9.
- Zain, A.Z. 2012. Management of intussusception in children. *Iraqi journal of community medicine.*, 25: 40-43.
