

East African Medical Journal Vol. 81 No. 9 September 2004

CHILDHOOD INTUSSUSCEPTION AT THE MOI TEACHING AND REFERRAL HOSPITAL ELDORET: MANAGEMENT CHALLENGES IN A RURAL SETTING

R. T. Kuremu, MBChB. (Nbi), MMed, Surg. (Nrb), MMed. Sc. (Natal), Lecturer, Department of Surgery, Faculty of Health Sciences, Moi University, P.O. Box 4606, Eldoret, Kenya

**CHILDHOOD INTUSSUSCEPTION AT THE MOI TEACHING AND REFERRAL HOSPITAL ELDORET: MANAGEMENT CHALLENGES IN A RURAL SETTING**

R. T. KUREMU

**ABSTRACT**

**Objective:** To review the management of childhood intussusception at the Moi Teaching and Referral Hospital, Eldoret and identify factors that require attention for improved outcome.

**Design:** A retrospective descriptive study covering the period January 2000 to December 2003.

**Setting:** Moi Teaching and Referral Hospital, Eldoret.

**Patients:** Thirty six children.

**Results:** Of the 36 children, 28 (78%) were males and eight (22%) females giving a ratio of 3.5:1. Median age was six months with a range of 2-72 months. The duration of symptoms was a mean of 5 days with a range of 1-14 days. Sixty one percent were referrals. Initial diagnosis of intussusception based on signs and symptoms was made in 6 out of 36 (17%) patients. The rest were initially treated for other problems. Decision to refer to surgeons, was based on abdominal distension. Plain x-ray was done in four patients and barium enema in one patient. Seventy five percent of the patients required fluid resuscitation before operation. All patients (100%) were managed operatively. Seventy two percent had ileo-colic intussusception, 8% ileo-ileal and 22% colo-colic. Perforation was found in 22% and gangrene in 31%. Sixty seven percent were successfully reduced by "milking" while 33% required resection and anastomosis/or stoma creation. Complications included: anastomatic breakdown, bronchopneumonia, renal failure, sepsis, recurrent intussusception and death. Mortality was 14% overall.

**Conclusion:** Early diagnosis and presentation coupled with improved peri-operative management are essential in improving outcome.

**INTRODUCTION**

Intussusception, which is invagination of a portion of intestine into the lumen of the immediately adjoining part, is the commonest cause of intestinal obstruction in infancy(1,2). The typical case is a well nourished male child 4 -12 months of age who is awakened from sleep with what seems to be violent abdominal pains(3). Any other of the classic signs and symptoms; vomiting, abdominal mass and rectal bleeding may be present. In spite of the foregoing, clinical diagnosis in most series has achieved accuracy in only upto 50%(4). Relying on the presence of all the classic signs and symptoms (in up to 30%) to make a diagnosis results in delayed intervention. The high prevalence of gastro enteritis in children in the tropics confuses the picture though it may as well be a major aetiologic factor (5). Late presentation is therefore a common feature and the management is attended by morbidity and mortality rates higher than in the developed countries.

A review of 36 children managed for intussusception at the Moi Teaching and Referral Hospital (MTRH) between January 2000 and December 2003 was done with the aim of establishing the pattern

of presentation, determining outcome of management and identifying factors that need attention to improve the outcome.

**MATERIALS AND METHODS**

Hospital records of children admitted and treated for intussusception between January 2000 and December 2003 were retrieved and analysed. The data analysed included patient demographics, signs and symptoms, duration of the signs and symptoms, diagnostic investigations, referral status, operative findings, operative procedure, complications, outcome and duration of hospital stay. The criterion for inclusion in the study was the finding of intussusception at operation.

**RESULTS**

Records of 36 children were analysed. Of the 36, 28 (78%) were males and eight (22%) females giving a ratio of 3.5:1. The median age was six months with a range of 2-72 months. The duration of symptoms was a mean of 5 days with a range of 1-14 days. Table 1 documents the symptoms at admission.

Sixty one percent of the patients were referrals from other health units. Initial diagnosis of

intussusception was made up of 6 of the 36 patients (17%) based on history and physical examination. The six had been admitted directly at MTRH. Others were initially treated for various illnesses: gastro-enteritis (44%), dysentery (22%), malaria (14%) and acute abdomen (3%). Decision to refer to surgeons for those treated for other illnesses was prompted by setting in of abdominal distension.

Plain abdominal X-ray was done in four patients and barium enema in one patient. In none of the plain X-rays was interpretation of features suggestive of intussusception made. These were performed on emergency basis in children with abdominal distension and surgeons interpreted the confirmatory features of intestinal obstruction. Seventy five percent of the patients were assessed as dehydrated, requiring fluid resuscitation before operation. These included referrals and those from paediatric wards in the referral hospital.

**Table 1***Signs and symptoms*

Sign/Symptom	Incidence	(%)
Abdominal pain	7	19
Vomiting	23	64
Diarrhoea	14	39
Bleeding per rectum	1	3
Constipation	9	25
Bloody stool	16	44
Prolapsed rectal mass	4	11
Fever	8	22
Abdominal distension	23	64
Dehydration	27	75
Abdominal mass	7	19
Rectal mass	8	22
Anaemia	1	3
Peritonism	11	31

**Table 2***Operative findings*

Finding	No.	(%)
Ileo-colic	26	72
Ileo-ileal	3	8
Colo-colic	25	22
Gangrenous	11	31
Intussusceptum		
Perforations of gut	8	22
Associated malrotation	3	8
Lead point	4	11

**Table 3***Operative procedure*

Operative procedure	No.	(%)
Successful manual reduction	24	67
Resection and primary anastomosis	9	25
Resection and stoma creation	3	8

**Table 4***Postoperative complications*

Complication	No.	(%)
Renal failure	1	3
Bronchopneumonia	3	8
Septicaemia	6	17
Anastomotic breakdown	3	8
Recurrent intussusception	2	6
Death	5	14

All patients (100%) were managed operatively (Table 2). Polyps were found in two of the 29(7%) patients with ileo-colic intussusception and in two of the four (50%) patients with colo-colic intussusception. Colo-colic intussusceptions were in children older than one year old. Table 3 documents operative procedures. Two patients had extensive gangrene of intussusceptum involving terminal ileum, caecum, ascending colon and a third of the transverse colon with multiple perforations of intussusceptions down to sigmoid colon. Perforations were noted at inspection before attempted reduction. To salvage a reasonable length of colon, the perforations were repaired and protected by formation of double-barrel ileocolostomy after excision of gangrenous gut. In the follow-up period, a distal loopogram was done showing good calibre colon. Gut continuity was re-established six weeks later. They both have been reported to have normal bowel function.

Three of the nine patients in whom resection and primary anastomosis was done, developed anastomotic leak. Repair was done in two while the third died before relaparotomy. Post-operative complications are shown in Table 4.

In the two with recurrent intussusception, one had colo-colic intussusception that had become gangrenous and perforated. This patient died of sepsis, after relaparotomy and stoma formation. The other patient had two ileo-ileal intussusceptions that were easily reduced manually by "milking". Five patients (14%) died. Mean duration of hospital stay (excluding time of stoma closure) was eight days.

## DISCUSSION

The diagnosis and treatment of intussusception of childhood has undergone changes resulting in highly effective diagnostic and therapeutic modalities with extremely low morbidity as well as favourable health care cost profiles(4,6,7). However, the findings of this study similar to reports from elsewhere in Africa(5,8,9) show higher morbidity and mortality. This unfavourable outcome is attributed to delayed presentation for surgical intervention and poor peri-operative care. Delayed presentation, can be attributed to low socio-economic status, limited hospital facilities, poor means of transport, unequal distribution of expertise and lower doctor patient ratio.

The median duration of signs and symptoms (5 days) is longer compared to reports from developed countries(10,11) that give duration in terms of hours. Some patients presented early but were treated for other problems: gastro-enteritis, malaria, dysentery and acute abdomen. They were referred when abdominal distention set in 64%. In the decision making process, history with classical features of abdominal pain, vomiting and mucoid bloody stools, was documented and, therefore, useful in 6 of 36 patients (17%). In the majority (64%) abdominal distention was the most important pointer to a surgical emergency. Most of the patients were therefore, picked in the late stages of disease progression when absolute intestinal obstruction had set in. The low reporting of classical presentation has been shown by other studies from Africa(5,9). In spite of the suggestion that gastro enteritis may be the major aetiologic factor the possibility of misdiagnosis is real.

The unequal distribution of expertise renders the diagnosis of intussusception at the health centres and most outpatients departments of hospitals difficult to achieve, as the primary care personnel manning these areas may not adequately handle challenging occasional problems when faced with relatively commoner differentials e.g. gastroenteritis, on a daily basis. As the distribution is unlikely to change in the near future, awareness that intussusception is common as shown by Muyembe and Suleman in Nyeri(13) will raise index of suspicion for the same.

The long referral protocol, starting from dispensary to health centre to district hospital and to MTRH did contribute to the delay in presentation. This is a product of low doctor patient ratio, and unequal distribution of expertise and critical care facilities. Increased morbidity resulting from delayed presentation is shown by high rates of gangrene and perforation. Intussusception, though conceptually and technically is within the realm of expertise of the general surgeons based in the referring hospitals (5 in the region), the hospitals do not have the capacity to handle paediatric anaesthesia, and this was the main reason for referral.

The paucity of imaging in the management strategies is glaring. Intussusception is unlikely to be reliably ruled out with clinical examination and plain radiography(1,4,13). The major improvements that have changed a disease that was almost uniformly fatal up to the mid-nineteenth century was the aggressiveness in the efforts in radiology both in diagnosis and definitive treatment(6). Contract enema and ultrasound (both with 100% proven accuracy), when available go a long way in improving management of intussusception. These studies require expertise and equipment unavailable in most of the rural health units.

Majority of the patients (75%) were dehydrated at the time of presentation to surgeons, requiring fluid resuscitation before operation. Considering that most were referrals this is an indication of poor fluid management while in the ward and in transit. These questions the ability of our health institutions to mount successful fluid deficit therapy in illnesses associated with significant loss. In a resource poor environment, simple measures like urine output monitoring, that effectively guide therapeutic regimes are achievable. In none of the patients was urine monitored.

The standard treatment in absence of peritonitis or free intra-abdominal air is barium, saline or air enema, followed by surgical intervention if the intussusception remains irreducible(6). Surgery is now the accepted back-up for fluoroscopic guided reduction of intussusception. A proportion or all of the 67% of the patients whose intestine was viable and were reduced manually at operation, would have benefited from any of the above fluoroscopic guided reductions. The benefits of non-operative treatment for intussusception in a resource poor environment cannot be overemphasised. As shown in the management of the two patients who had extensive perforations, salvage of reasonable length of colon is possible.

## CONCLUSION

In spite of the high prevalence of gastro-enteritis and other infectious diseases in children that may mask the occasional occurrence a high index of suspicion is needed and efforts to exclude intussusception made especially in an infant who presents with vomiting, abdominal pain and blood in stool. This effort should be complimented by improved fluid deficit management guided by the cheap and effective urine output monitoring. There is need to decentralize and strengthen health services delivery to enable district hospitals deal with paediatric surgical emergencies. Investment in imaging will create an enabling environment for improved diagnosis and treatment of intussusception and other diseases in general.

## ACKNOWLEDGEMENTS

To the management of MTRH and Research and Ethics Committee for allowing this research to be done. I also wish to thank colleagues; Prof. Esamai, Dr. Lessan and Dr. Jumbi for their valuable comments, and Margaret Ondwassy and Molly Awino for secretarial services.

## REFERENCES

1. Sorantin, E. and Lindbinchler, F. Management of intussusception. *J. Eur. Radiol.* 2004; **30**: (Abstract).
2. Dawod, S. T. and Osundwa, V. M. Intussusception in children under 2 years of age in the State of Qatar: Analysis of 67 cases. *Ann. Trop Paediatr.* 1992; **12**:121-126.
3. Bianchi, A. Surgical management of the neonate. In, *Essential Surgical Practice*, third Edition. Edited by Cushieri A., Giles, G.R., Moosa, A.R. Butterworth-Heinemann International Edition 1995 Oxford, G. Britain; 955-978.
4. Ein, S. H. and Duneman, A. Intussusception. In: *Operative Paediatric Surgery*, edited by Ziegler, M. M. *et al.* McGraw-Hill Professional, New York. 2003; 647-155.
5. Mwako, F. A. Abdominal Emergencies. In: *A Textbook of Paediatric Surgery in the Tropics*. Edited by Grant J. Macmillan International. College Edition. 1979; 146-156
6. Teele, R. L. and Vogel, S. A. Intussusception: The paediatric radiologist's perspective. *Pediatr. Surg. Int.* 1998; **14**:158-162.
7. Shiels, II W. E. Childhood intussusception: Management perspectives in 1995: What to do if it is recurrent. *J. Paediat. Gastroenterol Nutr.* 1997; **25**:117-118.
8. Ameah, E. A. The morbidity and mortality of right hemicolectomy for complicated intussusception in infants. *Niger. postgrad. Med. J.* 2002; **9**:123-124.
9. Adebamowo, C.A., Akang, E.E., Pindiga, H.U., *et al.* Changing clinicopathological profile of intussusception in Nigeria - a 20 year review. *Hepatogastro enterology.* 2000; **47**:437-440.
10. Eshel, G. Barr, J. Haymen, E. *et al.* Intussusception: A 10 year surgery (1986-1995). *J. Paediatr Gastroenterol Nutr.* 1997; **24**:253-156.
11. Ein, S. H., Alton, D., Palder, S. B., Shandling, B. and Stringer, D. Intussusception in the 1990s; has 25 years made a difference? *Pediatr Surg. Int.* 1997; **12**:5-6.
12. The Right to Maternal and Child Health. In, *Situation Analysis of Children and Women in Kenya*. A Government of Kenya and UNICEF publication. 1998; 101-118.
13. Muyembe, V. M. and Suleman, N. Intestinal obstruction at a Provincial Hospital in Kenya. *East Afr. Med. J.* 2000; **77**:440-443.