

Childhood intussusception: a 9-year review

B. T. UGWU, J. N. LEGBO, N. K. DAKUM, S. J. YILTOK, N. MBAH & F. A. UBA

Department of Surgery, Jos University Teaching Hospital, Jos, Nigeria

(Accepted February 2000)

Summary Sixty-four consecutive cases of intussusception in 48 infants and 16 older children managed at Jos University Teaching Hospital between January 1990 and December 1998 are reviewed. The age range was between 3 months and 15 years (mean 2.2 years) and the male to female ratio was 3.6:1. The quartet of abdominal pain, bloody mucoid stools, abdominal mass and palpable rectal mass was present in 70% compared with the classical triad (abdominal pain, bloody mucoid stools and abdominal mass) which occurred in only 32%. All the children had surgery. In 26 (41%) of the children, no associated cause was found, in three polyps formed the lead point and in five children a buried appendectomy stump formed the lead point. In 30 (47%) other children, mesenteric lymphadenopathy and inflamed Peyer's patches were noted. Ileo-colic intussusception occurred in 32 (50%) children. Manual reduction was successful in 67%. Bowel resection for gangrene, irreducibility and an iatrogenic colonic tear was done in 30% of patients. Two (3%) had spontaneous reductions. There were four deaths. The commonest complications were wound infection and adhesive intestinal obstruction.

Introduction

Barbette of Amsterdam first described intestinal invagination in 1674¹ and in the 18th century Hunter described the post-mortem pathology.² Although not confined to infancy and early childhood, intussusception is said to be prevalent in the 1st year of life.^{3,4} In most infants, intussusception is regarded as 'idiopathic' because the aetiology is usually not clear.^{3,5} In older children and adults, however, it could be a manifestation of an underlying local or systemic disease such as Meckel's diverticulum, buried appendectomy stump, polyps and proliferative disorders of the lymphoreticular system.^{6,7} Theories on the roles played by viral respiratory and gastro-

intestinal infections and climatic changes remain inconclusive.⁴ Less than 25% of cases present with the classical triad of abdominal pain, bloody mucoid stools and a palpable abdominal mass.⁸ The high prevalence of gastro-intestinal infections in the tropics, especially among older children, makes early and correct diagnosis a problem.⁹ Many reports have noted that the ileo-colic variety is the most common.^{10–12} Laparoscopic surgery, which is being used with success in many industrialized countries,¹³ is unavailable in most parts of the developing world.

Intussusception in infancy and childhood has been the subject of research in many parts of the world, including Nigeria.^{3–25} Despite this, ignorance on the part of parents and misdiagnosis by primary health workers in our area still leads to late presentation with its adverse effects.

To determine the pattern and factors that influenced outcome in the management of in-

Reprint requests to: Dr B. T. Ugwu, Department of Surgery, Jos University Teaching Hospital, P.M.B. 2076, Jos, Nigeria. Fax: +234 73 460006; e-mail: ugwub@unijos.edu.ng

TABLE I. No. of cases seen per year

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
No. cases	4	9	7	11	9	5	6	8	5	64
% of total	6	14	11	17	14	8	9	13	9	100

TABLE II. Monthly/seasonal incidence

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
No. cases	10	3	3	10	3	12	14	3	3	-	3	-	64
Season	Dry season: 55 cases (86%)						Wet season: 9 cases (14%)						100%

tussusception, we reviewed our experience of managing 64 infants and older children with this condition.

Materials and methods

The hospital records of 64 children aged 15 years or less consecutively admitted with intussusception to Jos University Teaching Hospital between January 1990 and December 1998 were reviewed. The demographic data, clinical presentation, management options and outcome were entered on a pro-forma and analysed using Epi-Info version 6 and the graph was drawn with the aid of the Harvard graphics.

Results

Eighty-six patients with intussusception were seen during the 9-year period, 64 (84.4%) of whom were aged 15 years or less and were the basis of the study. There were 48 (75%) infants and 16 (25%) older children whose ages ranged from 3 months to 15 years (mean 2.2 years). The total group consisted of 50 boys and 14 girls (3.6:1); among the infants there were 41 boys and seven girls (5.9:1) and the older children were nine boys and seven girls (1.3:1). The annual incidence of intussusception during the study period varied considerably (see Table I). There was a slight seasonal variation, the majority (55, 86%) being seen during the dry season (October–April), as shown in Table II.

All the infants were still being breastfed at the time of presentation, either exclusively (30, 47%) or with cereal supplements. The duration of symptoms ranged from 3 h to 10 days (mean 2.5 days). Thirteen (20.3%) cases, all infants, presented within 24 h; all the others presented after 24 h of symptoms. The main clinical features were abdominal pain, vomiting and dehydration; 21 (33%) presented with the classical triad of abdominal pain, bloody mucoid stools and abdominal mass, and 24 (38%) presented with a palpable rectal mass. Hence, the quartet presentation theory was a feature of 70% of these patients, all of whom presented late.

All the patients had surgery after adequate resuscitation. An accurate pre-operative diagnosis was made in all but one. Fig. 1 shows the types of intussusception in the study. The ileocolic variety was the most common and occurred in 50% of cases. In 26 (41%), there was no identifiable cause of intussusception. Polyps formed the lead point in three patients and an appendicectomy stump formed the lead point in five. Inflamed Peyer's patches and mesenteric lymphadenopathy were noted in 30 (47%) patients.

Manual reduction was successful in 43 (67%) and 19 (30%) required resection: for gangrenous bowel in 12, polyps in three, irreducibility in three and iatrogenic tear of the large bowel in one. The remaining two children had spontaneous reductions, evidenced at surgery by hyperaemia and oedema of the terminal ileum. Incidental appendicectomy

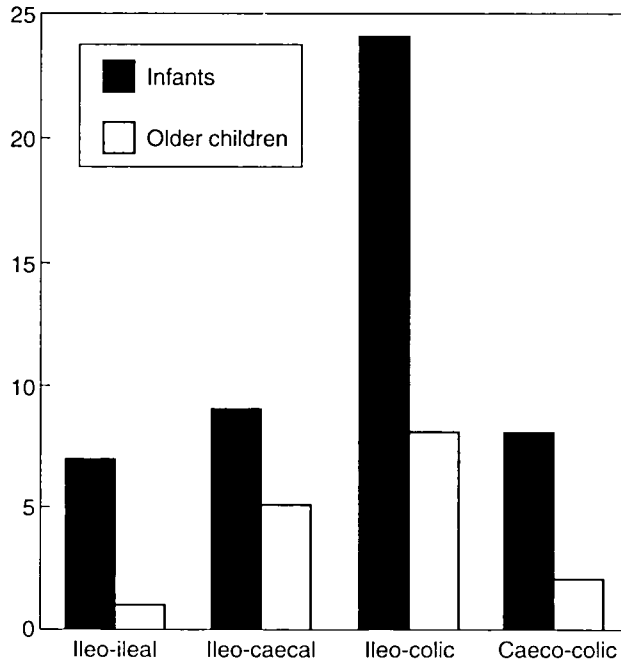


FIG. 1. Types of intussusception in the 64 children

was performed in three children, in all of whom the appendix formed part of the intussusceptum. The duration of hospitalization ranged from 7 to 28 days (mean 11).

The post-operative complications were: superficial wound infection, 17, 27%; adhesive intestinal obstruction, five; faecal fistula, two; and one case each of septicaemia and disseminated intravascular coagulopathy. There were four deaths (mortality rate 6.3%). No recurrent or retrograde intussusception was recorded in this study. The follow-up period ranged from 6 to 12 weeks.

Discussion

Intussusception is quite a common cause of intestinal obstruction in infancy and childhood.^{10,11} As in other studies,^{11,12,15} infants formed the majority of all intussusceptions, accounting for 56% of all cases seen at our centre with a male to female ratio of 3.6:1, which is in agreement with other reports.^{4,11,14} This gender bias was absent in older children. Although the annual incidence of seven cases a

year seems low, it compares well with other parts of Nigeria.^{3,9,11,12,15} The seasonal variation with a majority of 55 (86%) cases seen during the dry season (October–April) corresponds with the period when the incidences of respiratory tract infections and diarrhoeal diseases are high in this environment.²⁶ The long duration of symptoms in these patients prior to hospital attendance was because of misdiagnosis—most of them were mistakenly treated for diarrhoeal and helminthic diseases before referral to our surgical service. There were a few sicklers with intussusception in this series who before referral were initially managed by primary care physicians as acute abdominal crises. Abdominal pain was the commonest clinical feature in this study and it occurred in all cases. This is at variance with some reports in which vomiting was the commonest clinical feature.^{9,15} The classical triad of presentation (abdominal pain, bloody mucoid stools and abdominal mass) occurred in only 33% of our patients, which is similar to previous reports^{8,11} and implies that this can not be wholly relied upon in making a diagnosis. In

this study, where we took account of abdominal pain, bloody mucoid stools, abdominal mass and palpable rectal mass, the diagnostic yield increased from 33% to 70%. The presence of bloody mucoid stools and a rectal mass are late features, which underlines the fact that a significant proportion of these patients present late, often owing to ignorance on the part of their parents as well as misdiagnosis by primary care providers. We therefore recommend the quartet clinical presentation concept in centres where patients are likely to present late and where diagnosis of intussusception is based mainly on clinical features.

All patients in this series had laparotomy. The use of pneumatic/hydrostatic reduction has been advocated where clinical features do not suggest bowel strangulation.¹⁵ Despite its advantages (shorter period in hospital and avoidance of surgery), Pierce & Bahour²⁷ and Douglas²⁸ have reported colonic perforations following this procedure. Gross²⁹ and Wansborough³⁰ have reviewed large series of intussusceptions and concluded that this method of treatment is of no value other than diagnostic. In this series, no attempt was made at pneumatic/hydrostatic reduction because of delayed presentation. Our finding of causative factors in 59% of cases of intussusception is different from other series in which the disease was often considered idiopathic.^{8,9,11} Some authors reported small bowel involvement in up to 63% of patients.^{12,15} In line with the findings of other authors,^{11,12,15} the ileo-colic variety of intussusception was the most commonly seen in this series. However, this is at variance with some reports from south-western Nigeria where the caeco-colic variety has been found to be the commonest and has been attributed to the consumption of plantain (*Musa paradisiaca*), one of the staple diets in the area and known for its high levels of serotonin.¹⁸ Contrary to some reports,^{10,13} we recorded no multiple or retrograde intussusception in this series.

The resection rate of 30% in this series, although high, is lower than the rates of 50–62% reported in other series.^{11,12,15} Early post-operative intussusception,³¹ which usually

presents as small bowel obstruction within 2 weeks of major abdominal surgery, was not recorded in this study. Bowel viability was related to the duration of symptoms and the patient's clinical state at presentation. Although some authorities have recommended routine appendectomy in patients with intussusception involving the appendix, only three of our patients had appendectomy as an adjunct to their treatment. The incidence of gangrenous bowel (19%) was lower than in some series,^{11,12} and was related to superficial wound infection which was the commonest complication and occurred in 17 (27%) of our cases. One of the five who developed post-operative adhesive intestinal obstruction had adhesiolysis 7 months after the initial surgery; the others did well on conservative management. The overall mortality rate of 6% compares well with other reports.^{4,12,22} All those who died arrived moribund, with sepsis, anaemia and electrolyte imbalance.

We believe that early diagnosis and prompt, effective management, which could be achieved by a sustained public education programme and continuous medical education for primary care providers, would improve the outcome of intussusception in infants and older children.

References

- 1 Barbette P. Oeuvres Chirurgiques et Anatomiques. Geneva: Francois Miège, 1674.
- 2 Hunter J. On intussusception. Trans Soc Improve Med Chirurg Knowledge 1793; 1:103.
- 3 Ajao OG. Infantile intussusception. Trop Doct 1980; 10:72–3.
- 4 Ein SH, Stephens CA. Intussusception: 354 cases in 10 years. J Pediatr Surg 1971; 6:17–27.
- 5 Reijnen HAM, Joosten HM, Festen G. Intussusception in children 5–15 years of age. Br J Surg 1987; 74:692–3.
- 6 Wayne ER, Campbell JB, Kosloske AM, Burrington JD. Intussusception in the older child—suspect lymphosarcoma. J Pediatr Surg 1976; 11:789–94.
- 7 Pollet JE. Intussusception: a study of its surgical management. Br J Surg 1980; 67:213–14.
- 8 Bruce J, Borzi PA. Intussusception in childhood. Surgery 1992; 213–16.
- 9 Nmadu PT. Intussusception in older children: problems in diagnosis. Medical Update 1993; March/April:11–13.

- 10 Mann CV, Russel RCC, Williams NS. Acute intussusception. In: Bailey & Love's Short Practice of Surgery, 22nd edn. London: Chapman & Hall, 1995; 818-20.
- 11 Mangete EDO, Allison AB. Intussusception in infancy and childhood: an analysis of 69 cases. *West Afr J Med* 1994; 13:87-90.
- 12 Nmadu PT. The changing pattern of infantile intussusception in Northern Nigeria: a report of 47 cases. *Ann Trop Paediatr* 1992; 12:347-50.
- 13 Habib E, Elhadad A. Triple jejuno-jejunal intussusception discovered and treated with laparoscopy. *J Clin Paris* 1997; 134:133-6.
- 14 Elebute EA, Ades la AD. Intussusception in Western Nigeria. *Br J Surg* 1964; 51:440-4.
- 15 Ameh EA, Dogo PM, Nmadu PT. Intussusception in children and adults in Zaria: a comparison. *Centr Afr J Med* 1996; 42:207-9.
- 16 Garg SK, Lawrie JH. Intussusception in Northern Nigeria. *Niger Med J* 1974; 4:234-9.
- 17 Odita JC, Piserchia NE, Diakpovomre NA. Childhood intussusception in Benin City, Nigeria. *Trop Geogr Med* 1981; 33:317-24.
- 18 Adeloye A. Intussusception. In: Davey's Companion to Surgery in Africa, 2nd edn. London: Longman, 1987; 327-34.
- 19 Myell MJ. Intussusception in infancy and childhood in southern Africa: a review of 223 cases. *Arch Dis Child* 1972; 47:20-5.
- 20 Kark AE, Rundle WF. The pattern of intussusception in Africans in Natal. *Br J Surg* 1960; 48:296-09.
- 21 Dawod ST, Osundwa VM. Intussusception in children under 2 years of age in the State of Qatar: analysis of 67 cases. *Ann Trop Paediatr* 1992; 12:121-6.
- 22 Dennison WM, Shaker M. Intussusception in infancy and childhood. *Br J Surg* 1970; 57:687-94.
- 23 Hutchinson IF, Olayiwola B, Young DG. Intussusception in infancy and childhood. *Br J Surg* 1980; 67:209-12.
- 24 Strang RP. Intussusception in infancy in childhood. *Br J Surg* 1959; 46:484-95.
- 25 Benson CD, Lloyd JR, Fischer H. Intussusception in infants and children: an analysis of 300 cases. *Arch Surg* 1963; 86:745-51.
- 26 World Health Organization. *Epidemiology and Etiology of Acute Diarrhoeas, Directors' Guide and Teaching Materials*. Geneva: WHO, 1988; E46-54.
- 27 Pierce RJ, Bahour SB. Intussusception. *Am J Surg* 1966; 112:787-90.
- 28 Douglas BS. Intussusception in infants and children. *Austr Paediatr J Surg* 1969; 5:116-19.
- 29 Gross RE. *The Surgery of Infancy and Childhood*. Philadelphia: WB Saunders, 292.
- 30 Wansborough RM, Gran RW. Intussusception. *Can Med Assoc J* 1952; 67:307-9.
- 31 De Vries S, Sleeboom C, Aronson DC. Postoperative intussusception in children. *Br J Surg* 1999; 86:81-3.