Presentation and management outcome of childhood intussusception in Lagos: A prospective study

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ABSTRACT

Background: Intussusception is the commonest cause of bowel obstruction in infancy and childhood. Early diagnosis and effective management have reduced its morbidity and mortality in developed countries. **Aim:** To document the presentation, management and treatment outcome of intussusceptions at the Lagos University Teaching Hospital (LUTH). **Patients and Methods:** One hundred seventy-four consecutive cases of this condition seen in children presenting at LUTH over a 5-year period were prospectively studied. Details of symptoms and signs, pre-hospital care, treatment, and outcome in LUTH were documented. **Results:** The triad of abdominal pain, bloody mucoid stools and palpable abdominal mass was seen in 106 (61%) of the cases. One hundred thirty-five (77.6%) had been admitted and treated with antibiotics and intravenous fluids in primary healthcare centers for an average of 3 days before referral to the LUTH. Prolonged mean duration of recognizable symptoms of 3 days accounted for a 70.4% bowel resection rate. Wound infection occurred in 61 (36.1%), whereas fecal fistulae developed in six (3.6%), and burst abdomen in five (3%) of cases. Seven (4.1%) patients developed incisional herniae. Overall, mortality rate was 12.1%. **Conclusion:** The early symptoms of intussusception would seem to be missed by primary healthcare workers in Lagos, with consequently high morbidity and mortality. There is an urgent need to re-emphasize these symptoms to first-line healthcare providers and parents through public enlightenment campaigns.

Key words: Childhood, delayed diagnosis, intussusceptions.

INTRODUCTION

Intussusception, a pathological telescoping of a portion of bowel into an adjacent part, is the commonest cause of intestinal obstruction in infants.[1] The primary (idiopathic) type, mostly seen in infancy and childhood, is ascribed to non-specific viral origins, whereas in older children and adults intussusception is usually secondary to some identifiable intramural or intraluminal pathologies such as polyps, lipomas, and malignancies.[2,3] Late presentation as a cause of unacceptably high mortality and morbidity rates in intussusception have been documented from many African centers.[4-7] Many past studies on this condition from our sub-region were retrospective and we therefore embarked on this prospective study to document the presentation and management outcome of this condition in Lagos.

PATIENTS AND METHODS

Between January 1995 and December 2001, we prospectively kept records of all children presenting with intussusception, detailing the children's presenting symptoms and signs, symptoms duration as well as initial cares obtained from the referring hospitals in a protocol. The clinical state of each child on admission was noted while mode of treatment and outcome of management in LUTH were documented. For those who proceeded to surgery, operative findings, procedure performed, peri-operative complications, duration of hospitalization, and prognosis were all recorded. Data were analyzed on SPSS 9.0. Means and standard deviations were computed with the Student's t-test, whereas non-parametric variables were analysed by Chi-square method and unless otherwise stated, $P < 0.05$ was taken as significant.

RESULTS

One hundred seventy-four children were seen over the 6-year period, giving an annual hospital incidence rate of 25 patients. There were 102 (58.6%) males and 72 (41.4%) females, with a male-to-female ratio of 1.4:1. Mean weight was 7.8 ± 3.5 kg.

The ages ranged from 2 months to 7.5 years, with a mean age of 9.6 ± 14.3 months. The modal age was 6

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months, during which 46 (26.4%) of all cases occurred. The peak incidence was between 3 and 6 months, during which 131 (75.3%) of the patients were recorded [Figure 1]. Forty-three (24.7%) of the patients were still breastfeeding, 45 (25.9%) were weaning, whereas 88 (49.4%) had been weaned on presentation.

Peak seasonal presentation occurred in August, December, and April, coinciding with the three periods when the rain/dry seasons interchange in Lagos [Figure 2].

Abdominal pain, bloody stools, and vomiting had occurred for a duration of 1-15 days, with a mean duration of 2.8 ± 1.9 days. The classical triad of abdominal pain, bloody mucoid stools, and a palpable abdominal mass was seen in 106 (61%) of the cases. Upper respiratory tract infection occurred in 39 (22.4%) patients. In patients with non-palpable abdominal masses, there was gross abdominal distension and guarding. In 75 (43%) patients, the abdominal masses were also palpable per rectum. Thirteen (7.5%) patients presented with prolapsing masses at the anus [Figure 3]. These were significantly related to delayed presentation of more than 3 days ($P < 0.01$).

One hundred thirty-five (77.6%) patients had been previously admitted into private hospitals prior to presentation at our center and had been on antibiotics including metronidazole. Thirty-seven (21.3%) patients had no treatment prior to presentation, whereas two (1.1%) patients had been given native concoctions by traditional doctors. Sixty-seven (38.5%) presented in shock were septic, oliguric, or moribund.

Intravenous fluid resuscitation, correction of electrolytes derangements, antibiotics therapy, and early surgical exploration were the main thrusts of our management. Plain abdominal X-ray was obtained in all patients. Abdominal ultrasonography (USS), performed in only seven (4%) of the patients, was seldom indicated because of delayed presentation. Surgical intervention time ranged from 4 to 360 h, with a mean of 12.3 ± 38.9 h. Excluding the only patient who presented 15 days with a chronic obstruction, all others obtained treatment within 72 h of admission. Infrastructural delays, financial difficulties, and prolonged resuscitation needs in moribund patients were responsible for delayed intervention in our patients. Hydrostatic reduction was not attempted in this series.

Surgical exploration was the mainstay of treatment in 169 (97.1%) patients. Ileocolic intussusception was seen in 133 (78.7%) of all cases that had laparotomy, the colocolic variety was recorded in 28 (16.6%) cases, whereas the ileoileal type was seen in eight (4.7%).

In 119 (70.4%) patients, manual reduction was attempted at surgery. Forty-seven (27.8%) of these attempts were

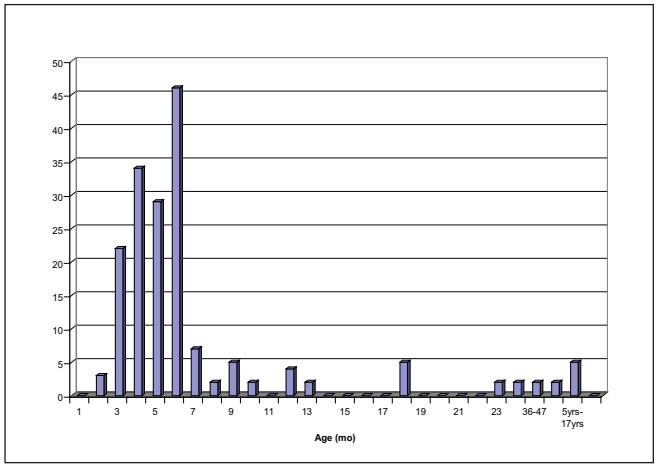


Figure 1: Age distribution among children with intussusception

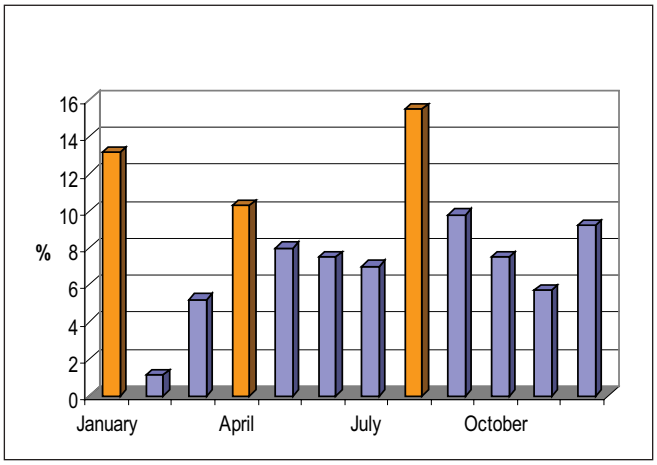


Figure 2: Seasonal pattern



Figure 3: Prolapsing anal mass

successfully. A total of 119 (70.4%) (comprising the 75 unsuccessful reductions and another 44 deemed outright unfit for manual reduction at laparotomy) underwent bowel resection and end-to-end anastomosis [Figure 4]. Ninety-six (56.8%) of these patients had right hemicolectomy, whereas in 23 (13.6%) others, limited ileal resection was performed.

Three patients were diagnosed at laparotomy as having spontaneously reduced. The remaining five patients did not undergo surgical exploration for the following reasons: two died before any surgical intervention, two were discharged against medical advice, and one had pre-operative spontaneous resolution. Each of these had earlier been diagnosed as having intussusception through the clinical observation of the triad of bloody mucoid stools, colicky abdominal pain, and palpable sausage-shaped abdominal mass in addition to plain abdominal radiological evidence of intussusception.

Of the 174 cases recorded, 164 (94.3%) resulted from non-specific lymphadenitis. One of these children subsequently developed chickenpox post-operatively. Five (2.9%) cases were seen post-operatively, whereas solitary polyps formed the lead point in three (1.7%) other cases. In two (1.1%) cases, the lead points.

Duration of hospitalization ranged from 2 to 48 days, with a mean hospitalization period of 17.1 ± 10.6 days.

Wound sepsis was the commonest complication, occurring in 61 (36.1%) of all operated cases. Fecal fistulae occurred in six (3.6%), whereas burst abdomen was seen in five (3.0%) of our cases. In three (1.8%) patients, there was recurrence of intussusception. One of these had been on steroids for laryngotracheobronchitis and still showed massively enlarged mesenteric nodes, possibly as a result of ongoing steroid therapy in the presence of suspected viral infection. This patient was re-explored under local anesthesia because her airway

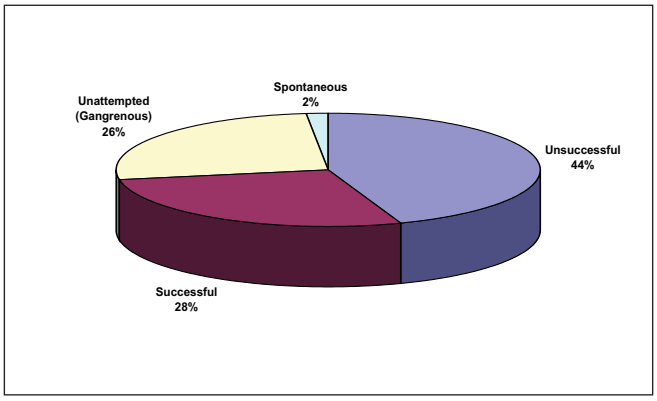


Figure 4: Surgical reduction of intussusception (n = 169)

posed great challenge to anesthetists. Late complications seen in our patients were stitch granuloma nine (5.3%), incisional hernias seen in seven (4.1%) patients, and post-operative adhesive bowel obstruction in two (1.2%) children. Follow-up period was 4 months to 5 years.

Overall, 153 (87.9%) survived, whereas 21 (12%) died. Two (1.1%) of these had died before surgical intervention, whereas the remaining 19 (11%) died in the peri-operative period from overwhelming sepsis in 12 (6.9%), unresolved pneumonia in six (3.4%), and anesthetic complication in one (0.6%). Mean duration of abdominal pain, vomiting, and bloody mucoid stools were significantly greater for patients who died compared with that of the survivors [Table 1].

DISCUSSION

Lagos is a tropical humid, industrial seaport West African city with about 13 million inhabitants. The Lagos University Teaching Hospital (LUTH), a 600-bed institution, handles an annual referral of 10,000 paediatric cases. It is estimated that the hospital attends to no less than 70% of all intussusceptions in the Lagos metropolis. From our records at the LUTH, we had observed that intussusception remains the top surgical emergency among infants and the leading cause of intestinal obstruction in this age group. The age range seen in our study was in keeping with universally quoted period, whereas the peak incidence at 6-9 months recorded matched what has been severally reported in local and international literatures.[8-10]

The seasonal variation we reported however portrays the peculiarity of primary intussusception as seen in this part of the world. The three peak periods of presentation coincide with the times of seasonal changes in Lagos. The Harmattan, a north-eastern trade wind, blows cold dry and dusty from the Sahara desert in late December and early January. April marks the onset of the raining season while there is a brief dry, cold spell from late July till mid-August each year. At each of these weather transitions, there usually occurs an outbreak of viral upper respiratory tract infection and diarrhea diseases. There has been no definitive

Table 1: Prognostic factors

Symptom	Survivors (n = 153)	Dead (n = 21)	*P*-value
	Mean duration (SD) (days)	Mean duration (SD) (days)	
Bloody stool	2.6 = 1.9	4.8 = 1.1	0.0*
Abdominal pain	2.8 = 2.1	4.3 = 1.8	0.03*
Vomiting	2.7 = 2.0	4.8 = 1.3	0.0*

*Significant

association between the seasonal rates of rotavirus and intussusception.[11,12] However, Bode and Omilabu[13] documented the presence of viruses in 60.1% of a group of children from Lagos metropolis with intussusception and isolated adenoviruses in the stools of more than half of them, using monoclonal antibodies. The role of other viral agents in the etiology of intussusception in West Africa remains to be explored.

Abdominal colic, bloody mucoid stools, and persistent vomiting occurred in over 95% of our cases, leading to early presentation at first-line hospitals within the metropolis. Many of these cases were however misdiagnosed as possible amebic dysentery and sent back home on metronidazole and antibiotics. The delay occasioned by this poor pre-referral care led to a prolonged mean duration of 3 days recorded in this study. The attendant poor prognosis seen in 12.2% was largely as a result of this delay. Most authors from our sub-region have bemoaned the high mortality resulting from delayed presentation in intussusception.[4,5,9] However in these studies, the delay was caused by parents who presented the patients late in the hospitals. A notable departure from this pattern was recorded in our study where over 75% of our patients had presented early to primary healthcare facilities, but were misdiagnosed and wrongly given ambulatory therapy for suspected infective gastroenteritis. This therefore calls for an urgent awareness campaign among doctors, nurses, and parents in Lagos to raise the index of suspicion *of* and increase the rate of early presentation in this condition. In a well-designed comparative study of management outcome of intussusception between a rural African setup and an American metropolis hospital, Meier *et al*,[14] attributed the 18% mortality rate in the Africans to delayed presentation and consequent gangrenous bowel and opined that non-operative reduction would have achieved little in this group of moribund late presenters. Although Meier's cases were villagers traveling from afar to the Baptist Mission medical outpost in Ogbomoso, Nigeria, our patients, all of whom were city dwellers would similarly have benefited little from a non-operative approach.

Our management priorities comprising fluid resuscitation, correction of electrolytes derangements, antibiotics therapy, and early surgical exploration were sometimes constrained by institutional-, financial-, and patient-related factors. As typical of many, a developing country setup, LUTH is not free of power outages, shortages of consumables and other institutional bottlenecks traceable to the absence of committed, workable governmental policies on healthcare funding. Our experience in this regard was similarly to many reports from sub-Saharan Africa, where emergency services are encumbered by infrastructural deficiencies.[5,9,15] Adejuyigbe *et al*,[16] attributed the high rates of bowel resection and mortality in intussusceptions managed in Ile-Ife, Nigeria to delayed presentation. Similar conclusions have been made by others who unanimously advocated improved awareness of intussusception among stakeholders to reduce its unacceptably high mortality in Africa.[17-20] While the Nigerian economy is opening up to investors in a few key areas, the health sector is still encumbered by bureaucratic bottlenecks, poor funding, and an over-centralized command structure. Patients, including children, pay cash for most services and the indigents inevitably suffer delay. In addition, very ill patients took longer to resuscitate before surgery. These delays contributed to the avoidably prolonged surgical interventional time noted in our series.

Ultrasonography was not always readily available and was seldom employed in this series as it would not have significantly influenced the course of surgical therapy. Barium enema, which could be used to diagnose and pressure reduce the intussusception, was not performed in these very ill children because it is contraindicated in prolonged delay where gangrenous bowel could easily perforate. It is hoped that with improved awareness of this condition and consequent increase in the number of early presentations, future studies will elucidate the benefits of this treatment modality on selected cases in our center.

The complications recorded in our study were typical of our third-world setting. Wound infection (attributable to the moribund state in over a third of our patients at presentation) was initially a bother in the early years of our study until we employed delayed primary closure to reduce the rates of invasive sepsis in these patients.

The mortality rate of 12.1% needs to be improved upon through prompt recognition of symptoms and early referral. This figure is however comparable to similar rates obtained from other workers in our part of the world where rates of between 8 and 25% have been recorded.[6,14,16,18,21] Harouna *et al*,[5] observed a heavy 55% mortality among cases of paediatric intussusceptions in Niamey, Niger Republic. This was attributed to delayed presentation and advanced peritonitis, coupled with inadequate facilities to manage these challenging cases.

From this study, it is concluded that delayed referral

from primary care givers is a major cause of prolonged duration of symptoms and the attendant high morbidity and mortality in childhood intussusception seen in Lagos. This delay stems from misdiagnosis of the condition and efforts should be made to improve awareness at both parental and primary care levels to promote early presentation and referral. Institutional lapses and healthcare policy defects should be redressed to minimize the avoidable complications of intussusception among children.

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