

Childhood intussusception: Impact of delay in presentation in a developing country

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Access this article online

Website:
www.afrijaedsurg.org

DOI:
10.4103/0189-6725.194665

Quick Response Code:



ABSTRACT

Background: The classical cases of intussusception are readily diagnosed clinically, and despite recent improvements in radiological techniques, the diagnosis of intussusception and success in its nonoperative reduction has been suboptimal, thus making operative management a veritable backup. This study examined the impact of delays in presentation on the rate of bowel resection, length of hospital stay, and appraised the outcome of operative treatment.

Patients and Methods: This was a retrospective study of consecutive children admitted and treated surgically for intussusception between January 2002 and December 2011 at the University College Hospital, Ibadan, Nigeria. **Results:** The mean age at presentation was 13.4 months with a male: female ratio of 1.8:1. Fourteen patients (25.5%) presented within the first 24 h of onset of symptoms with majority (36.4%) presenting between 2 and 3 days of onset of symptoms. The primary surgical intervention was performed on 47 patients (85.5%), and the secondary operative intervention was performed on eight patients (14.5%) who had failed initial nonoperative management of intussusception. Manual reduction of intussusception was performed on 27 patients (49.1%), 26 patients had resection of gangrenous bowel with end-to-end anastomosis while two patients (3.6%) had spontaneous reduction of intussusception which was discovered at laparotomy. The mean duration of hospital stay was 12.1 days (range 3–60 days). The overall mortality was 5.5% (three patients), and three patients (5.5%) had recurrence of intussusception.

Conclusion: Although mortality is reducing, a high rate of bowel resection is a consequence of delayed presentation and effort should be made to make an early diagnosis of intussusception and make prompt referral to improve outcome.

Key words: Delayed, intussusception, presentation, reduction, surgical

INTRODUCTION

Intussusception remains a common cause of bowel obstruction in infants and young children, and it is a major source of significant morbidity and mortality if not promptly treated.^[1,2] The classical cases of intussusception are readily diagnosed clinically with reported accuracy of about 50%, but intussusception may mimic other conditions in children such as gastroenteritis which has a high prevalence in the tropics thus giving a confusing picture.^[3-5] The accepted management of intussusception consists of adequate resuscitation, radiological confirmation of diagnosis, and radiological reduction for uncomplicated cases with surgical intervention as a last resort.^[6] Children treated at tertiary hospitals have higher rates of nonoperative reduction than children treated at peripheral hospitals.^[7] Despite recent improvements in radiological techniques, the diagnosis of intussusception and success in its nonoperative reduction has been suboptimal in tertiary care facilities in the developed countries.^[1] However, reports from some developing countries have shown that surgical management is still routinely performed for intussusception.^[8] This study, therefore, examines the impact of delays in presentation on the rate of bowel resection, length of hospital stay, and appraises the outcome of operative treatment.

PATIENTS AND METHODS

The medical records of 55 consecutive children admitted and treated surgically for intussusception

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Cite this article as: Ogundoyin OO, Olulana DI, Lawal TA. Childhood intussusception: Impact of delay in presentation in a developing country. Afr J Paediatr Surg 2016;13:166-9.

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between January 2002 and December 2011 at the University College Hospital, Ibadan were reviewed. Data extracted included the age, and sex of the patients, duration of symptoms before presentation, method of diagnosis, type of surgical procedure performed on the patients, postoperative complications, and the duration of hospital stay.

RESULTS

A total of 55 children were admitted and operated on for intussusception during this period. The mean age at presentation was 13.4 months (range 4 months–8 years). There were 35 boys and 20 girls with a male:female ratio of 1.8:1 [Table 1]. Thirty-four patients (61.8%) presented within the first 3 days of onset of symptoms. Of these, 14 patients (25.5%) presented within the first 24 h. Plain abdominal X-ray and abdominal ultrasound were used to confirm the diagnosis of intussusception for all the patients that were managed for intussusception before January 2005 while abdominal ultrasound was exclusively used to confirm the diagnosis of intussusception after this period. Abdominal ultrasound findings included target sign and pseudokidney appearance in 28 patients (50.9%). The mean hematocrit concentration was 11 g/dl (range 7.7 g/dl–15 g/dl). The primary surgical intervention was performed on 47 patients (85.5%); this included all consecutive patients managed for intussusception between January 2002 and December 2004 (14 patients, 25.5%), and 33 patients (60%) that presented from January 2005 and were not considered for nonoperative management of intussusception while secondary operative intervention was performed on eight patients (14.5%) who had failed initial nonoperative management of intussusception. Intraoperatively, manual reduction of intussusception was performed on 27 patients (49.1%), 26 patients had resection of gangrenous bowel with end-to-end anastomosis while two patients (3.6%) had spontaneous reduction of intussusception which was discovered at laparotomy.

Seventeen patients (30.9%) developed postoperative complications and postoperative pyrexia were seen

Table 1: Age and sex distribution

Age (in months)	Male (%)	Female (%)
0-3	0	0
4-6	18 (32.7)	7 (12.7)
7-12	8 (14.6)	8 (14.6)
12-24	6 (10.9)	4 (7.3)
25-60	1 (1.8)	1 (1.8)
>60	2 (3.6)	0
Total	35 (63.6)	20 (36.4)

in nine patients (16.4%). Other complications were surgical site infection in two patients (3.6%), wound dehiscence, and adhesive bowel obstruction in three patients (5.5%) each. The mean duration of hospital stay was 12.1 days (range 3–60 days). The overall mortality was 5.5% (three patients), and three patients (5.5%) had a recurrence of intussusception.

DISCUSSION

The reported mean duration of symptoms before presentation in the hospital varies from 3.5 to 5 days.^[4,9]

This is common to most pediatric surgical centers in this country, and our center is not an exemption. Simon *et al.*^[10] suggested that delay in presentation to the hospital may be due to the parents but mostly from the peripheral hospitals. The practice is to start the children on herbal concoctions and in some cases go to local drug stores to seek for medical advice. This is borne out of the fact that a larger percentage of the population live on <1 USD per day^[11] and most parents do not have sufficient funds to take them to the hospital coupled with the fact that there is no effective health insurance system in the country.

However, several authors^[4,11,12] have shown that about 64%–85% of patients had presented early to primary health-care facilities but were referred very late. The symptom complex of vomiting, abdominal pain, and passage of watery and bloody stool may mimic gastroenteritis, malaria, and other causes of acute abdomen in children. This often leads to initial misdiagnosis and late referral.^[4,12] Conversely, the duration of symptoms is in terms of hours in the developed countries^[13-15] and they do not have delays in referral from the peripheral centers.^[15] This may explain why prognosis is poorer in the developing countries because the presentation of patients depends on the availability of quality health care and the possibility to access it easily when the child is in distress without much delay.^[15] While it may be difficult to convince individual parents to present their children to the specialist centers early, some authors^[12,15] have suggested improved awareness campaign among doctors and other health-care providers in the peripheral centers to raise the index of suspicion for intussusception and the need for prompt referral.

Ultrasonography has been adopted as the first-line diagnostic tool for intussusception in our center because it is cheap, easily accessible for use, has no risk of radiation, highly sensitive, and specific.^[16,17]

It is used to confirm the suitability of the patient for nonoperative management to guide hydrostatic reduction of intussusception.^[18]

The definitive management of intussusception has evolved from operative management through hydrostatic reduction to pneumatic reduction of intussusception.^[18] Pneumatic and hydrostatic reductions of intussusception have demonstrated a high rate of success in the management of patients with intussusceptions.^[19-21] Operative management is now the accepted back – up for nonoperative management when it fails; however, it is the standard management adopted in the face of suspected bowel gangrene and perforation.^[4,9]

Many studies^[8,12,22] from Sub-Saharan Africa reported the use of operative intervention to treat every patient presenting with intussusception. Lack of facilities for pneumatic and hydrostatic reductions and delayed presentations have been variously suggested for this.^[21,23] This was the case in our center until January 2005 when ultrasound-guided hydrostatic reduction of intussusception was adopted for all uncomplicated cases of intussusception presenting within the first 72 h of the onset of symptoms.^[9] The high rate of bowel resection has been variously attributed to delayed presentation,^[12,24-26] our study showed that more patients (23.7%) had bowel resection and anastomosis to treat their intussusception and they presented after 3 days of onset of symptoms, although there was no significant difference between the rate of manual reduction and overall resection rate [Table 2]. Overall bowel resection rate of 47.3% is high but still within the reported range of 1.4% and 47.4%.^[10,19,22,23,26,27] The recorded postoperative complications are not different from the reported complications, and they are due to sepsis and are wound related.^[8,12] The mortality rate of 5.5% is a marked improvement from the earlier reported rate of 8% from this center.^[28] Expectedly, hospital stay was prolonged (mean – 12.1 days) in this study and patients (25.5%) who had resection of nonviable bowel stayed longer in the hospital than those (6%) who had a simple manual reduction. This may not be unconnected to the presence of perforation of the bowel and peritonitis that may accompany the gangrenous bowel that necessitated the resection [Table 3].

CONCLUSION

The duration of symptoms is still largely responsible for the high rate of bowel resection in this study and the high morbidity although the mortality is

Table 2: The duration of symptoms and type of surgical procedure performed

Duration of symptoms (days)	Manual reduction (%)	Bowel resection (%)	Spontaneous reduction (%)
<1	9 (16.4)	3 (5.5)	2 (3.6)
2-3	11 (20.0)	9 (16.4)	-
4-5	2 (3.6)	9 (16.4)	-
>5	5 (9.1)	4 (7.3)	-
Total	27 (49.1)	26 (47.3)	2 (3.6)

Table 3: The duration of hospital stay and the type of surgical procedure performed

Hospital stay (days)	Manual reduction (%)	Bowel resection (%)	Spontaneous reduction (%)
0-5	2 (3.6)	1 (1.8)	2 (3.6)
6-10	19 (34.6)	11 (20.0)	-
>10	6 (10.9)	14 (25.5)	-
Total	27 (49.1)	26 (47.3)	2 (3.6)

reducing. A high index of suspicion is needed to exclude conditions such as gastroenteritis and other causes of acute abdomen in children that may mimic intussusception, make prompt diagnosis, and refer the patients promptly for nonoperative management to achieve a better outcome and reduced hospital stay.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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