Case series

Intestinal Obstruction in Childhood Caused by Intussusception: Experience at A Tertiary Hospital in Southern Nigeria

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Abstract

Background: Intestinal obstruction in children is the commonest cause of acute abdominal conditions in this age group. Intussusception represents the commonest cause of intestinal obstruction in children aged between 3 months and 3 years with a peak age of incidence at 6 months. The aim of this study was to determine the prevalence of intussusception amongst Children managed for intestinal obstruction at Olabisi Onabanjo University Teaching Hospital Sagamu.
Methods: Case Series
Results: Case records of 870 children managed for intestinal obstruction during the study period were assessed. A total of 452 cases (52%) of intussusception were responsible for intestinal obstruction during the study period.
Conclusion: Intussusception was the commonest cause of intestinal obstruction amongst children who presented with intestinal obstruction during the study period.

Key words: Childhood, Intestinal Obstruction, Intussusception, Tertiary Hospital, South-West, Nigeria.

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INTRODUCTION

Intussusception is the invagination of one segment of the intestine, usually proximal into a more distal segment, though sometimes there may be the invagination of a loop of bowel occurring from distal to proximal segment. It is the most common cause of bowel obstruction in infants, occurring usually between three and eight months with a peak age of incidence at six months. The ileum usually invaginates through the caecum and can travel as far as the anal orifice to present as prolapsed intussusception. The aftermath of the process of invagination is loss of blood supply into the intussuscepted loop of bowel. If intussusception is left unresolved, it would lead to bowel gangrene, perforation and peritonitis.[1,2,3]

There are approximately 74 intussusceptions per 100,000 infants occurring annually worldwide. The incidence has been reported as high in Vietnam and Korea with 300
per 100,000 infants and as low in Bangladesh with nine per 100,000 infants.[3,4] Usually, acute intussusception presents with vomiting, colicky abdominal pain, and passage of bloody stool. The diagnosis of intussusception is most clinical but can be aided with the use of abdominal ultrasonography, plain abdominal radiography, computerized tomography scan and barium emema.[5,6] Intussusception is a surgical emergency in infants and young children aged between three months to three years. It is the second most common cause of acute abdomen in children, following acute appendicitis; it occurs as a result of invagination of the proximal part of bowel into another adjacent distal loop of bowel. It is said to be idiopathic or primary with no identifiable cause and can occur occasionally from the distal into a proximal loop of bowel; it can also occur post-operatively as a result of intra-abdominal sepsis, electrolyte derangements and prolonged paralytic ileus after any abdominal surgery.[7,8,9]

However, intussusception in children aged three years and above tend to be associated with lead points such as remnants of urachus, persistent vitello-intestinal, meckel's diverticulum, polyps, adenomas and helminthiasis. Intussusception can also be classified according to the site involved in the process; for example, Ileo-colic, Jejuno-Jejunal, Colo-colic and Enterogastric. Ileo-colic is the commonest type of intussusception seen in children. In the absence of a single aetiological agent, the occurrence of intussusception in children is associated with various risk factors such as upper respiratory tract infections, weaning from breast milk and introduction of protein rich food supplements. The characteristic presentation of intussusception are pain, projectile vomiting and passage of red currant jelly stool.[10,11,12] The diagnosis of intussusception may be confused with the presentation of other causes of acute surgical abdominal conditions in children such as acute appendicitis, gastro-enteritis, helminthiasis, intestinal obstruction from malrotation, intestinal atresias and post-operative adhesions. The diagnosis of intussusception is mainly based on findings from history and physical examinations, though difficult presentations could be resolved using radiological investigative modalities such as abdomino-pelvic ultrasound, plain abdominal radiography and computerized tomography scan of the abdomen.[13,14,15]

The treatment of choice for cases that presented early remains non-operative reduction through hydrostatic or pneumatic techniques; for late presentation and failed attempts at non-operative reduction, exploratory laparotomy with manual reduction for viable loops of bowel or resection and anastomosis in the presence of non-viable intussuscepted loops of bowel.[16,17] This retrospective study was carried out to determine the various causes of intestinal obstruction, the contribution of intussusception as an etiological agent amongst the children studied.

MATERIALS AND METHODS

Cases of intestinal obstruction in children aged between 0-15 years were retrospectively observed between March 2023 and April 2014 (a 10-year period). Intestinal obstruction cases caused by intussusception were identified and enrolled into the study. The differential diagnosis of the aetio-pathogenesis of intestinal obstruction in the age group studied were determined through the documented reports in the case records of the patients. The mode of presentation, the investigative modalities employed in arriving at the provisional and definitive diagnosis were retrieved from the case reports. The types of treatments, operative findings, definitive diagnosis, post-operative care, outcome (complications and deaths) and findings during follow-up at the paediatric out-patient clinic were retrieved. The prevalence of intussusception amongst the study population was determined. The obtained results would be analysed and reported in numbers, percentages, tables, graphs and bar diagrams. The presentation of intussusception, diagnostic modalities, treatment types, outcome of treatment were retrieved, documented and analysed with SPSS version 29.

RESULTS

Case records of 870 children managed for intestinal obstruction during the study period were retrieved for data extraction. 570 (65.5%) were males and 300 (34.4%) were females. **(Figure 1)** The pathologies responsible

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for cases of intestinal obstruction that were managed during the study period were intussusception 482 cases (55.4%), neonatal sepsis 128 (14.7%), obstructed hernias 78 (8.9%), intestinal atresias 68 (7.8%), ano-rectal malformations 44 (5.1%), hirschsprung's disease 32 (3.7%), malrotation 21 (2.4%), post-operative adhesions 17 (2.0%). **(Table 1)**

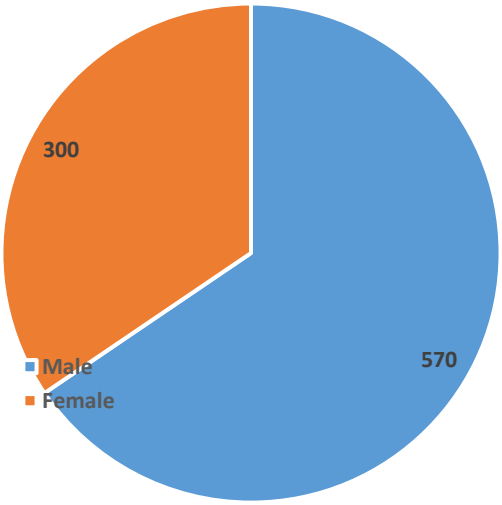

Figure 1 showing sex distribution of respondents

Table 1: Differential Diagnosis of intestinal obstruction in the cases

Differential Diagnosis	Frequency	Percentage
Intussusception	482	55.4
Neonatal sepsis	128	14.7
Obstructed Hernias	78	8.9
Intestinal atresias	68	7.8
Ano-rectal malformations	44	5.1
Hirschsprung's disease	32	3.7
Malrotation	21	2.4
Total	**870**	**100**

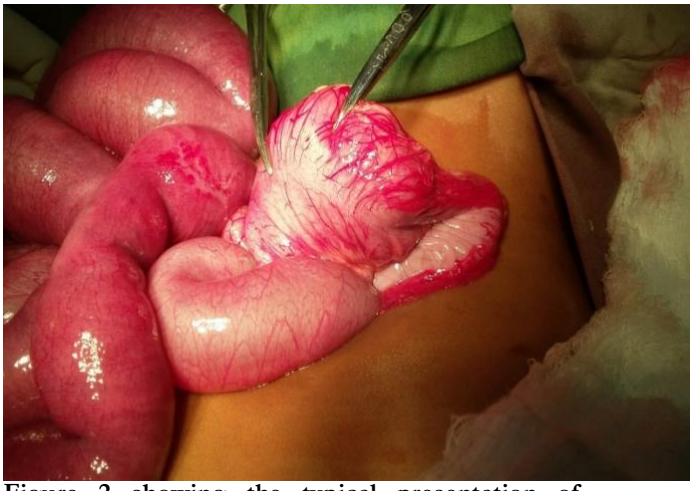

Figure 2 showing the typical presentation of intussusception intra-operatively

Figure 3 showing prolapsed intussusception

Table 2 showing pre-operative complications associated with late presentations

Pre-Operative Complications	Frequency	Percentage
Palpable abdominal mass	175	51.2
Severe anaemia	88	25.7
Peritonitis	57	16.7
Prolapsed intussusception	13	3.8
Septicaemia	9	2.6
Total	342	100

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A total number of 442 patients had operative management and out of this number, 312 (70.6) had manual reduction because of the viability of the intussuscepted segments while 130 (29.4) patients had intestinal resection and anastomosis. 160 (36.2) patients out of the operated case had surgical site infection. 20 (4.5) had wound dehiscence, 3 (0.7) patients had burst abdominal wound and 2 (0.5) patients had enterocutanous fistula. We had a total of seven deaths from septicaemia.

DISCUSSION

Intussusception is the commonest cause of intestinal obstruction in children aged between 3 months to 3 years. Intussusception was the most prevalent cause of intestinal obstruction amongst all the cases of intestinal obstruction observed during the study period. This is similar to the findings of Malik et al.[18] The peak age of intussusception in our study was 6 months thou we recorded cases of intussusception in some two months old and 3 years old patients. Other studies have also made observations similar to our findings.[19,20]

Intussusception in patients less than 2 months is not common and poses pre-operative diagnostic challenges. Intussusception seen in patients aged 3 years and above were usually associated with lead points such as remnants of urachus, persistent vitello-intestinal duct, meckel's diverticulum, polyps, adenomas and intestine worms. The lead points found in some of our cases were mickels's diverticulum and intestinal worms. In the absence of a single aetiological agent, the occurrence of intussusception in children less than 3 years is associated with various risk factors such as upper respiratory tract infections, weaning from breast milk and introduction of protein rich food supplements. [21,22] The characteristic presentation of intussusception are pain, projectile vomiting and passage of red currant jelly stool. However, the diagnosis of intussusception may be confused with the presentation of other causes of acute surgical abdominal conditions in children such as acute appendicitis, gastro-enteritis, helminthiasis, intestinal obstruction from malrotation, intestinal atresia and post-operative adhesions.[23]

The diagnosis of intussusception in our study was based mainly on findings from history and physical examinations, though difficult presentations were resolved through the use of radiological investigative modalities such as abdomino-pelvic ultrasound, plain-abdominal radiography and computerized tomography scan of the abdomen. This similar to methods adopted by other researchers.[24] The cases of intussusception in our patients who were aged less than 3 years were idiopathic or primary as no pre-disposing lead points were identified intra-operatively. These findings are consistent with the report of other workers.[25]

The predominant symptoms of intussusception in our study were abdominal pain and irritability. This was followed by vomiting, abdominal distension and passage of recurrent jelly-stool. Prominent findings on physical examination were dehydration, pallor and fever. These agree with reports of other researchers.[26] The diagnosis of intussusception was based mostly on the documentations of history obtained from informants, physical examination findings and the results of investigative modalities such as abdominal ultrasonography and plain abdominal x-ray. Five of our cases had abdominal computerized tomography scan to make a definite diagnosis of intussusception pre-operatively. Other investigations carried out were employed to prepare these patients for operative intervention. These included haematological tests such as packed cell volume, full blood count, blood grouping and cross-matching (where indicated), heamolgobin genotype where indicated; chemical pathological tests which included serum electrolyte assay and urinalysis. These investigative modalities employed by our team were similar to investigations carried out by other surgeons who managed cases of intussusception. [27,28]

Intussusception usually results from proximal to distal invagination of an adjacent loop of bowel to another but can also result from distal loop into proximal loop (especially in adults); it may also be seen post-operatively as a result of prolonged paralytic ileus from intra-abdominal sepsis or electrolyte derangements.[29] Intussusception can also be classified according to the site involved in the process; for example ileo-colic, jejuno-jejunal, colo-colic and entero-gastric. Ileo-colic is the commonest type of intussusception seen in children. In our study, ileo-colic intussusception was the commonest type of intussusception seen; this finding is in agreement with the report of other workers.[30,31]

The treatment of choice for cases that presented early remained non-operative reduction through hydrostatic or pneumatic techniques; for late presentation resulting to perforation with peritonitis, prolapsed intussusception and failed attempt at non-operative reduction require operative intervention. Operative intervention may be simple manual reduction and incidental appendectomy (because of peri-appendiceal injury); however, in the presence of non-viable intussuscepted segments of bowel, resection and anastomosis would be necessary. This protocol of treatment has been documented by other researchers.[32]

The prognosis of intussusception was good in patients who presented early while complications and mortalities were observed in late presenters. This agrees with the

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findings of other researchers.[33,34] Complications observed in our study were surgical site infections, wound dehiscence, incisional hernia, enterocutaneous fistula and burst abdominal wounds. Complications rate and spectrum were similar to the observations of other workers. Thirty-five (7.7%) deaths were recorded, and they resulted mostly from septicaemia and malnutrition. Our findings are similar to the reports of other authors.[35] The only differential diagnosis is transient acute physiological intestinal intussusception. It is similarly characteristic on ultrasound but is short with incessant peristalsis and integrity of the mucosal layers. These functional intussusceptions disappear during the examination or a few hours later.[36]

CONCLUSION

With a prevalence of 55.4%, intussusception was the commonest cause of intestinal obstruction within the age group studied. The treatment option for the cases managed were mostly operative due to late presentations with complications. Non-operative mode of management especially hydrostatic reduction is also being practiced in our center.

Conflict of Interest Declaration: Nil

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