

POOR PROGNOSTIC FACTORS OF INTUSSUSCEPTION IN CHILDHOOD AS SEEN IN ILORIN, NIGERIA

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SUMMARY

This was a prospective study of 24 children with intussusception seen over a 3 year period at the University of Ilorin Teaching Hospital. Males were more affected than females at a ratio of 3:1, with 70% of the cases occurring in children between 6 months and 2 years of age. The common presenting symptoms were vomiting in 83.3%, bloody stool in 75%, abdominal distension in 58.3%, diarrhoea in 58.6% and constipation in 37.5% of the cases. An abdominal mass was palpable in 58.3%. Majority of the patients presented late with 70.8% presenting beyond 24 hours from the onset of the symptoms. Ileocolic intussusception accounted for 72.9% of the cases whilst ileo-ileal occurred in 12.5%. Mesenteric lymphadenopathy was the predominant detectable predisposing factor at surgery in 25% of the cases. Fifty percent had gangrenous bowel requiring resection at surgery.

The mortality rate was 29.2%. Mortality was high in those with delayed presentation beyond 48 hours from onset of symptoms (38.5%, odds ratio "OR" = 2.81, relative risk "RR" = 1.33), severe acidosis (75%, OR=12.0, RR=3.2), temperature > 38.5° centigrade at admission (80%, OR=21.33, RR=4.2), severe dehydration, and respiratory distress (62.5% and 66.6%, respectively RR=2.3), and a delay in surgical intervention beyond 48 hours from admission (66.6%, OR=6.4, RR=2.29).

The poor prognostic factors observed in this study included delayed presentation beyond 48 hours from the onset of symptoms, severe respiratory distress at presentation, temperature > 38.5° centigrade at admission, severe acidosis, severe dehydration and delay in surgical intervention beyond 48 hours. Children with intussusception still present late to our facility with the resultant development of the above stated bad prognostic factors and its attendant high mortality.

INTRODUCTION

Intussusception is a common cause of intestinal obstruction in infancy and childhood, occurring mainly in children below the age of 2 years¹⁻⁶, and rarely in older children and adults^{7,8}. The mortality is high and ranges from 11.2 percent to 47.7%³⁻¹¹.

Most reviews have not shown an obvious aetiological factor at surgery⁷⁻⁹, though mesenteric adenopathy seems to be the common finding in 12% to 25% of the cases in childhood⁶⁻¹⁰. Speculated factors of high mortality in previous studies include delayed presentation, long segment of the intussusception, and septicaemia³⁻⁹. Because of the high mortality seen in these cases, this study aimed at identifying the predictors of a poor prognosis in children with intussusception.

MATERIALS AND METHOD

This a prospective study of twenty four children clinically diagnosed as intussusception with confirmation at surgery over a 3-year period (January 1996 to December 1998).

All patients had a full history taken at admission including the age, gender, duration of illness before presentation etc. A full physical examination, inclusive of a rectal examination was done in all the patients on admission. The patients had abdominal ultrasound, plain abdominal X-ray (erect and supine), electrolyte and urea, full blood count and blood culture done. None of the patients had a barium enema done due to delay in presentation in a situation in which the appropriate radiological facilities were lacking.

The patients were rehydrated according to the degree of dehydration. Acidosis was corrected by giving 2 Meq/Kg of sodium bicarbonate, hypokalaemia by 2 Meq/Kg of potassium chloride added to the drip over 24 hours. Nasogastric tube aspiration was done before surgery.

Antibiotic therapy was instituted at admission with ampicillin gentamycin and metronidazole parenterally. The input and output were monitored closely. Surgical intervention was carried out as soon as the patient was stable enough to undergo surgery, and fund was made available. Some of the patients had to source for fund, hence, a delay in surgical intervention.

The Odds ratio (ops) was calculated with 95%

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confidence limit where applicable, and the relative risk "RR" determined.

RESULT

Table I shows that 17 (70.9%) of the cases occurred in the first year of life with a peak at 6-11 months of age accounting for 54.2% of the cases. There was a male preponderance with a male : female ratio of 3:1.

TABLE I: The age and sex distribution of the 24 children with Intussusception.

Age in months	Number	Percentage
<6	4	16.7
6-11	13	54.2
12-23	4	16.7
24-35	1	4.2
36-47	-	-
48-59	1	4.2
>60	1	4.2

The classical triad of abdominal pain, abdominal mass and rectal bleeding was observed in 9 (3.7%) cases.

Vomiting was the most predominant symptom seen in 83.3%, bloody stools in 75%, abdominal mass in 58.8% (78.7% of the masses was felt to the left of the umbilicus), diarrhoea in 54.2% and constipation in only 29.2% of the cases (Table II).

TABLE II: The symptoms seen in the 24 cases of Intussusception

Symptoms	Number	Percentage
Vomiting	20	83.3
Bloody stool	18	75
Abdominal distension	13	54.2
Diarrhoea	13	54.2
Fever	15	62.5
Abdominal Pains	9	37.5
Constipation	7	29.2
Anorexia	6	25
Rectal prolapse	2	8.3
Previous operation	1	4.2
URTI	1	4.2

Most of the patients presented late with 87.5% presenting beyond 24 hours from the onset of symptoms. The duration of symptoms ranged between 12 hours to 9 days.

Table III shows the identified signs with

abdominal distension in 75%, dehydration of different degrees in 79.2% with a mass palpable in 58.3% of the cases.

TABLE III: The signs elicited in the 24 cases of intussusception.

Signs	Number	Percentage
Abdominal distension	18	75
mild	3	12.5
moderate	12	50
severe	3	12.5
Tachycardia	14	58.3
Temperature >37.5°C	13	54.2
Dehydration	19	79.2
mild	5	20.8
moderate	13	54.2
severe	8	33.3
Acidotic breathing	6	25
Visible peristalsis	6	25
Mass	14	58.3
Right	11	45.8
Left	3	12.5
Bowel sounds -Hyperactive	11	45.8
Hypoactive	9	37.5

TABLE IV: The Surgical findings at operation

Type and location	n	%
Ileocolic	19	79.2
Ileoileal	3	12.5
Ileocaecal	1	4.2
Unknown	1	4.2
Operative procedure		
Manual	11	45.8
Gut resection	12	50
Spontaneous reduction	1	4.2
Identified aetiologic factors		
Unknown	16	66.7
Mesenteric lymphadenopathy	6	25
Subserosal lipoma	1	4.2
Intramural haematoma	1	4.2

Table IV shows the surgical findings at operation. Ileocolic intussusception was the most common type, seen in 19 (79.2%), and ileoileal in 3 (12.5%) cases. Gangrenous segment of the bowel was seen in 50% of the

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cases. Manual reduction of the intussusception was carried out in 12 (50%) cases, and resection in 11 (45.8%). One reduced spontaneously.

Mesenteric lymph node enlargement was the predominantly observed predisposing factor seen only in 6 (25%) of the cases whilst subserosal lipoma and intramural haematoma was seen in one (4.2%) case respectively

The overall mortality was 29.2%. (Table V)

TABLE V: The poor prognostic factors in the cases of intussusception.

Factor	Total	Died	% Mortality	Odds ratio "OR"	Relative Risk "RR"
Duration before presentation					
<24 hrs	3	0	0%		
24-48 hrs	8	2	25%**		
>48 hrs	13	5	38.5%**	2.81	1.33
Acidosis					
HCO ₃ <18 mmol/L	4	3	75%**	12.0	3.20
T^o>38.5oC					
Severe	5	4	80%**	21.33	4.21
Dehydration					
Severe	8	5	62.5%**	11.69	2.3
Respiratory Distress					
Severe	6	4	66.6%**	10.0	2.50
Interval between Admission & Surgery					
<24 hours	16	3	18.7%		
24-47 hours	5	2	40%**		
>48 hours	3	2	66.6%**	4.33	1.63
Packed cell volume					
<30%	13	4	30.8%		
>30%	11	3	27.3%	0.84	0.95
Age					
<12 months	17	5	29.4%		
>12 months	7	2	28.6%	0.96	0.98

** The odds ratio was at 95% confidence limits.

Twenty five percent of those presenting between 24 to 48 hours from the onset of symptoms died; whilst those presenting beyond 48 hours recorded a mortality of 38.5% and none of those who presented within 24 hours had any mortality.

Three out of four cases (75%) with severe acidosis (HCO₃<18 mmol/L) died OR=12.0, "RR"=3.2). There was no significant derangement of the serum levels of sodium and potassium in a large proportion of the patients, hence,

no significant association between the sodium and potassium levels and outcome was seen.

Severe anaemia was not a significant finding in our patients with intussusception. The packed cell volume averaged 31% at admission, and none of the patients had blood transfusion before surgery.

The admission PCV did not significantly affect the mortality (OR=0.84, RR=0.95). Of the 5 cases with an admission temperature of 38.5 centigrade and above, 4 (80%) died (OR=21.3, RR=4.2). Also those with severe dehydration and respiratory distress at admission recorded a high mortality of 62.5% and 66.6%, respectively (OR=11.7, RR=2.3).

A temperature of 38.5 degrees centigrade at admission was strongly associated with a high mortality (80%, OR=21.3, RR=4.2). Severe dehydration and severe acidosis at presentation was associated with a double fold increase in mortality (OR=11.69, RR=2.3).

A delay in surgical intervention beyond 48 hours from admission was associated with an exponential increased risk of mortality (33.3% in 36-47 hours and 66.6% beyond 48 hours) (OR=3.57, RR=1.85) Table V.

Some of the patients had multiple of these factors with a cumulative effect on the mortality pattern.

DISCUSSION

The high mortality recorded in intussusception in this study is similar to those reported in other studies¹⁻¹³. Majority of our patients reported late to the hospital as evidenced by the high incidence of bloody stools in the series.

The finding of preponderance of males in this study is in keeping with those of other workers¹⁻¹⁰. Over 80% of the cases were children below the age of 2 years, which is similar to other reports^{1-6,8-10}.

Abdominal pain was the most common presenting symptom in some series¹¹, whereas vomiting tops the list of symptoms in this study and others^{2,6}. Diarrhoea was more common in these children and rather than constipation, a finding that is in consonance with other reports^{1,2,11-13} as against the textbook figures.

A temperature of 38.5^o centigrade and above at admission was associated with high mortality in this series. The high temperature seen in these patients is commonly seen in those with gangrenous bowel, which enhances the development of sepsis. Since most of our patients present late, gangrene was observed at operation in 50% of the cases. Spontaneous reduction occurred in only one case. Hydrostatic reduction was not attempted in our patients due to lack of appropriate facilities and the fact that the patients present late in the hospital, but a previous study

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has shown that the benefit of such a procedure is doubtful⁴.

The major identifiable predisposing factor seen at surgery in these patients was enlarged mesenteric lymph nodes forming the lead point of the intussusception, occurring in only 25% of the cases which is similar to the finding of previous authors^{11,15}. The ileocolic variety was the common intussusception seen in this series, a finding that is comparable to other series^{2,11-13,15}.

The mortality rate was 29.2% which is similar to those reported by other workers^{2,6,9,10}. Mortality was high in those with delayed presentation beyond 48 hours from the onset of the illness which is similar to the findings in other series^{5,6}.

An admission temperature of 38.5 degree centigrade and above increased the mortality fourfolds in this study.

Other factors that significantly increased the mortality included severe acidosis, respiratory distress at admission, severe dehydration, and a prolonged interval between admission and operation.

These factors occurring either singly or in combination portend a grave outcome for intussusception cases.

In conclusion, a delayed presentation beyond 48 hours from the onset of symptoms, severe respiratory distress at presentation, temperature greater than 38.5^o centigrade at admission, severe acidosis, severe dehydration and delayed period of surgical intervention beyond 36 hours is associated with a high mortality. The finding of any of these factors in a patient with intussusception should activate an aggressive approach to therapy in order to reduce the mortality. These factors are likely going to be seen in those who cause delays before seeking medical attention, hence, such patients should be screened for the poor prognostic factors.

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