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# Childhood Typhoid Intestinal Perforation in Aba, Nigeria

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**Abstract:** Typhoid intestinal perforation is still prevalent in many low and middle income countries. This may be due to lack of potable water, poor refuse disposal and health education. This study is to evaluate the outcome of management of typhoid intestinal perforation in children at the Abia State University Teaching Hospital Aba Nigeria. This is a prospective study of children who were managed for typhoid intestinal perforation at the Paediatric Surgery unit, department of Surgery of the Abia State University Teaching Hospital Aba Nigeria from November 2016 to September 2018. Proforma was opened for demography, clinical features, investigation, site of perforation, type of surgery, complications and outcome. Data collected were analysed using SPSS computer software version 17 for proportions and percentages. Results: Sixty patients were seen over the sixteen months study period. Forty males and twenty females with a male to female ratio {2:1}. Their ages ranged from 3 years to 15 years with a mean age of 8.9 years. Fever, abdominal pain, vomiting and abdominal distension were the commonest clinical features in over 50% of patients. Doubled layer closure and resection and anastomosis of ileal segment were done in equal number of patients [20 patients each]. Surgical site infection was the most common complications in 50 [83.3%] of patients. Five patients died giving a mortality rate of 8.3%. Typhoid intestinal perforation is still a persistent scourge in low income countries. Morbidity is still high despite low mortality in this series. Early presentation, good nutrition and public health education will improve outcome.

**Keywords:** Typhoid, Intestinal Perforation, Childhood

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## 1. Introduction

Typhoid fever, caused primarily by a gram negative bacillus *Salmonella typhi*, a severe febrile illness in many low and middle income countries [1, 2]. Typhoid infection has continued to be a public health disease which is generally transmitted by faeco-oral route. The areas with poor sanitation and limited availability of clean, potable water may occasionally lead to an epidemic of the disease [3-4]. It is a global health problem that can have a devastating impact on middle and low income counties like Nigeria. The control of the infection has been achieved in developed countries by effective public health measures while low and middle income countries continue to bear the burden of the disease [5]. The surgical complications of typhoid fever are a cause of significant morbidity and mortality.

The surgical complications of typhoid fever such as intestinal perforation and haemorrhage cause a lot of

significant morbidity and mortality in many parts of Africa, particularly in sub-Saharan Africa where standard medical facilities are not yet readily available [6]. Intestinal perforation is a serious complication of typhoid fever and remains a significant surgical problem in developing countries [7]. The high incidence of perforation in most developing countries has been attributed to late diagnosis and the emergence of multidrug resistant and virulent strains of *Salmonella typhi* [8]. The disease affects mostly young adults who contribute enormously to the economy of low and middle income countries [9].

The management of typhoid intestinal perforation poses diagnostic and therapeutic challenges to paediatric surgeons practicing in low and middle income countries [10]. Surgery is considered the treatment of choice in order to improve the chances of survival of patients with this condition, which most the patient often present late [10].

Despite the high mortality and morbidity of typhoid

intestinal perforation in low and middle income country like Nigeria, relatively a little is known about the pattern of this disease and its prognostic factors in this set up. The purpose of this study was to describe our experiences on the surgical management of typhoid intestinal perforation outlining the clinical profile, treatment, outcome of this disease. It is hoped that identification of these factors will help in policy decision making, prioritizing management and improving the quality of care in typhoid intestinal perforation at the Abia State University Teaching Hospital Aba Nigeria.

## 2. Methods

This is a prospective study of children who were managed for typhoid intestinal perforation at the Paediatric Surgery unit, department of Surgery of the Abia State University Teaching Hospital Aba Nigeria from November 2016 to September 2018. All patients were admitted through either the accident and emergency or outpatient department of the hospital, diagnosed with Typhoid intestinal perforation on the basis of its typical history, clinical examination and supported by radiological and laboratory investigation and confirmed by operative findings. All other causes of peritonitis caused by perforated appendix, traumatic perforations, and perforated peptic ulcers were excluded from the study.

The data of each patients was entered in a proforma for demography, duration of symptoms prior to presentation, clinical features, investigations, duration between onset of peritonitis and surgical operations, resuscitative measures, site of perforation, procedure performed, complications, length of hospital stay and outcome.

All the patients were resuscitated with intravenous fluids, nasogastric decompression of the stomach, urethral catheterization for monitoring of urine output and intravenous antibiotics consisting of third generation cephalosporin, gentamycin and metronidazole. Upon adequate resuscitation, laparotomy via supraumbilical incision under general anaesthesia was carried out. Operative findings noted, type of surgical procedure carried out stated, All had mass closure with Nylon and intraperitoneal drain left insitu. The postoperative complications and mortality for each procedure carried out was noted. Data collected were analysed using SPSS computer software version 17 for proportions and percentages.

## 3. Results

### 3.1. Demography

Sixty patients were seen over the sixteen months study period, including forty males and twenty females with a male to female ratio {2:1}. Their ages ranged from 3 years to 15 years with a mean age of 8.9 years. Fifty percent of the patients were within the age range of 6-10 years as shown in

Table 1.

*Table 1. Age distribution of patients.*

Age (years)	Number	Percentage
1-5	10	16.7%
6-10	30	50%
11-15	20	33.3%
Total	60	100

### 3.2. Time of Presentation

Twenty patients [33.3%] presented within the first week of their illness while 40 patients presented after one week of their illness as shown in Table 2.

*Table 2. Duration of symptoms before presentation.*

Duration (weeks)	No of cases	Percentage
<1w	20	33.3%
1-2	15	25%
2-3	15	25%
3-4	10	16.7%

### 3.3. Clinical Features

Fever, vomiting, abdominal pain and distension were the commonest clinical features in over 50% of patients as shown in Table 3.

*Table 3. Clinical presentation.*

Clinical features	Frequency	Percentage
Fever	60	100
Abdominal pain	54	90
Abdominal distension	60	100
Vomiting	60	100
pallor	54	90
Dehydration	60	100
Jaundice	20	33
Convulsion	10	16.7
Haematochezia	10	16.7
Constipation	10	16.7

### 3.4. Number of Perforation

50% of the patients had single ileal perforations while rest of the patients had two, three and four perforations as shown in Table 4.

*Table 4. Number of ileal perforation.*

Number of perforation	Number of cases	Percentage
1	30	50%
2	15	25%
3	10	16.7%
4	5	8.3%

### 3.5. Operative Findings

Fifty percent of the patients had perforation with a distance of 10cm from the ileocecal valve while the remaining perforation occurred from 11 to 50cm from the ileocecal valve as shown in Table 5.

*Table 5. Operative findings.*

Distance of perforation from the ileocaecal valve	Number of cases	Percentage
1-10	30	50%
11-20	10	16.7%
20-30	10	16.7%
30-40	5	8.3%
40-50	5	8.3%

### 3.6. Operative Procedures

Doubled layer closure and resection and anastomosis of ileal segment were done in equal number of patients [20 patients each] while single layer closure and limited right hemi-colectomy were done in 10 patients, Five patients died giving a mortality rate of 8.3% as shown in Table 6.

*Table 6. Operative procedures performed and mortality rate for each procedure.*

Procedure	Number of cases	Deaths	Mortality rate
Single layer closure	10	1	10%
Resection & anastomosis of ileal segment	20	2	10%
Limited Right hemicolectomy	10	1	10%
Double layer closure	20	1	5%

### 3.7. Complications

Surgical site infection was the most common complications in 50 [83.3%] of patients as shown in Table 7.

*Table 7. Operative Morbidity.*

Complications	Number of cases	Percentage
Surgical site infection	50	83.3%
Chest infection	30	50%
Intraperitoneal abscess	30	50%
Anastomosis leakage	5	8.3%
Enterocutaneous fistula	5	8.3%

## 4. Discussion

Typhoid infection is a major health problem facing low and middle income countries. The disease is transmitted by feaco-oral route by contamination of food and water by carriers of Salmonella organisms. Poor Sanitation, unclean food and water supplies still prevail and non adherence to the basic tenets of hygiene remains the major ways of contracting the disease. However, the old adage prevention is better than cure is the most effective way of dealing with the disease. Typhoid intestinal perforation, a dread complication of typhoid fever is still prevalent in this environment with preponderance among males. The index series shows a male to female ratio of 2:1 similar to reports by Ugochukwu et al. [11] in Enugu South East Nigeria and Adesunkaami et al. [12] in Ife South West Nigeria and Parry et al.[13] The disease was more predominant between the age range 6-15 years in this series which is comparable to Aliyu et al. [14] in Potiskum North Central Nigeria with peak age group of 11-20 years with about 65% of the patients being 20 years or younger and Ugochukwu et al. in Enugu that found the peak age to be 10-19 year which may result from the feeding habit at this stage in life without taking appropriate consideration of the hygienic nature of the food and environment.

The clinical features of typhoid perforation have not

changed over several decades. Fever, abdominal pain and distension were the prominent symptoms and signs in this series. Similar reports were made by Agbakuru et al. [14] in Ife South West Nigeria and Ugochukwu et al in Enugu South East Nigeria. As in many other reports, majority of our patients have only one perforation. The locations of the perforations occurred 1cm to 50cm from the ileo-cecal junction. This range is similar to most reports in Nigeria [15].

Two layered closure following debridement is the preferred surgical procedure. However, 10 patients in this series had two layered closure while the remaining had right hemicolectomy or ileal resection and anastomosis due to multiple perforations. Similar findings have been reported in other low and middle income countries [16].

Surgical site infection was the most common complication in over 80% of the patients in this series, followed by chest infection and intraperitoneal abscess. Similar findings were noted by other workers in Nigeria and other low and middle income countries. There was no reperforation in this series, though rare, require high index of suspicion for its detection. When detected should be managed by immediate reoperation. Aliyu et al reported 2.24% reperforation rate which were dealt with by re-exploration. While Ekenze et al. [17] Enugu Nigeria reported reperforation rate of 21.3% [20]. The lack of reperforation in this series was a result of taking into cognizance the potential areas that are liable to perforate and dealing with them at initial operation. During surgery for typhoid perforation the whole ileum should be inspected for such potential areas for reperforation and should be under run with suture.

Enterocutaneous fistula is another potential complication liable to occur in bowel resection, the current study found 8.3%. However, all except one enterocutaneous fistula closed on expectant management. This emphasized the need for patience in their management. Previous study found similar trend of 2.5% by Anupama et al. [18] and 2.63% by Aliyu et al.

Mortality rate of 8% was recorded in this series which is

comparable to mortality rate of 8% by Mock et al. [19] but lower than 14.18% reported by Aliyu et al in North Central Nigeria.

## 5. Conclusion

Late presentation, inadequate preoperative resuscitation, delayed operation, number of perforations and the extent of faecal peritonitis have been found to have a significant effect on prognosis. While mortality in the developed world has dropped to between 0% and 2%, mortality in the developing world remains high at between 9% and 22%. Health education, provision of portable water, enactment and enforcing good hygienic principle will go a long way in reducing the burden of this disease.

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