Typhoid ileal perforation in children: does clinical diagnosis alone justify laparotomy?

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Introduction: Typhoid ileal perforation is one of the most common surgical complications of typhoid fever, with high morbidity and mortality in resource poor tropical areas in Africa and other developing countries.

Objective: The aim of this study was to evaluate clinical diagnosis of typhoid ileal perforation as justification for laparotomy.

Method: A retrospective study from January 2008 to December 2011 in the Paediatric Surgery Division of the University of Abuja Teaching Hospital.

Results: The age group most commonly affected was aged 6-9 years (43.5%); there were 20 (43.5%) males and 26 (56.5%) females. The commonest clinical features were fever, vomiting, abdominal pain, tenderness and distension (52.3%). Thirty one (67.4%) of the patients did not have any diagnostic radiological investigations. Fifteen (32.6%) patients had superficial wound infection, ten (21.7%) died, eleven (23.9%) had no complications.

Conclusion: We advocate that under circumstances where urgent diagnostic radiological and laboratory investigations are not available promptly, clinical diagnosis of typhoid ileal perforation, especially signs of peritonitis should justify an emergency laparotomy.

Key words: typhoid, ileal perforation, peritonitis, laparotomy

INTRODUCTION

Typhoid fever (Enteric fever) is caused by *Salmonella typhi* which is transmitted faeco-orally. It presents with fever, chills, headache, abdominal pain and tenderness. It is a public health problem which becomes a surgical emergency if medical treatment fails.

A common surgical complication is distal ileal perforation. Most of the perforations occur in the Peyers patches which are organized lymphoid nodules; they contain B and T-lymphocytes.[1] Through cell mediated hypersensitivity, the lymphoid nodules become necrosed, perforation of the bowel wall follows with contamination of the peritoneal cavity. A cascade of inflammatory reactions ensue and septic peritonitis. Typhoid perforation has a reported incidence of about 20% in adults and 10.3% in children.[1, 2] Surgery is the main stay of treatment of these patients after adequate resuscitation.

The outcome of the management of typhoid perforation has been disappointing with high rates of morbidity and mortality especially in children.[2, 3, 4] Many factors contribute to the high mortality and include delayed presentation and surgical intervention, the ongoing severe peritonitis, septicaemia, fluid and electrolyte derangement and malnutrition.[5]

The diagnosis of typhoid perforation is made from clinical features, while radiologic investigations – erect and supine or lateral decubitus abdominal x-rays – help to confirm the diagnosis by the presence of air under the diaphragm or free intra-peritoneal air. The period of this study was fraught with prolonged and incessant power outages and as such radiological investigations were not readily done. Delayed investigations and hence surgical intervention being major causes of the high mortality it was clear to our team that we needed to answer the question "Does clinical diagnosis alone of typhoid ileal perforation justify laparotomy?"

METHOD

This was a retrospective study in the Paediatric Surgery Division of University of Abuja Teaching Hospital Gwagwalada, Abuja. Ethical clearance was obtained from the Human Research and Ethics Committee of the institution.

The data of the patients from January 2008 to December 2011 were retrieved from the medical record department

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and operating theatre register. The data studied were patient's age and sex, presenting clinical features, investigations done, time of presentation to surgical intervention, type of procedure and postoperative complications. The data were analyzed for outcome of treatment using IBM SPSS version 14 for Windows.

We excluded all case notes with poor documentation of information needed and case notes of patients whose intra operative findings showed no ileal perforation.

RESULTS

There were 52 operations for diagnosis of typhoid perforation. Six cases (one which had ruptured appendicitis) were excluded following findings different from typhoid perforation. Forty-six patients had typhoid ileal perforation. The commonest age group affected was 6-9 years (43.5%). There were 7 (15.2%) aged 2-5 years, 16 (34.8%) aged 10-13 years and 3 (6.5%) aged 14 years and above. Twenty (43.5%) were males and 26 (56.5%) were females.

Table 1 shows the clinical features as distributed in the various groups.

Thirty-one (61.4%) patients did not have any radiological investigations before surgery, twelve (26.1%) had an abdominal x-ray and one had a chest x-ray (Table 2) of which only five showed air under the diaphragm, one ground glass appearance and six multiple air-fluid levels (Figure 1).

Only three patients were investigated bacteriologically; blood, urine and stool cultures each yielded *Klebsiella*, no growth, E coli respectively (none yielded *Salmonella typhi*). Six patients were operated upon within six hours of presentation, while 38 went to surgery over the next 18 hours (Table 3). Complications (Table 4) were superficial surgical site infection 15 (32.6%), intra- abdominal abscesses 3 (6.5%), re-perforation 1 (2.2%), and mortality 10 (21.7%).

DISCUSSION

There was a 11.5% negative laparotomy rate for typhoid perforation, a finding higher than 4.8% of that recorded by Agbakwuro et al.[6]

The male to female ratio in our study was 1:1.3. This is in contrast to studies done in other parts of Nigeria and Africa which recorded ratios of 1.9:1, 2.6:1 and 1.4:1 by Ugwu et al, Chalya et al and Osifo respectively.[7, 8, 9]

All the patients had fever, vomiting, abdominal pains and clinical features of peritonitis which is in keeping with previous reports.[7] In addition, 52.2% of the patients had abdominal distension. These clinical features were taken as indices of perforation.

In our study, apart from measurements of packed cell

Table 1. Clinical features of ileal perforation reported

Clinical features	n (%)
Fever+ vomiting + abdominal pain	1(2.2)
Fever + vomiting + abdominal pain and tenderness.	7(15.2)
Fever+ vomiting +abdominal pain + tenderness + abdominal distension	24(52.2)
Fever+ vomiting	32(61.5)
Abdominal pain+ tenderness +swelling +constipation	14(30.4)

Table 2. Distribution of investigation done by patients with typhoid perforation

Investigations	n (%)
Chest x-ray	1(2.2)
None	31(67.4)
Urine culture	1(2.2)
blood culture	1(2.2)
Abdominal x-ray	12(26.1)

Table 3. Waiting time before surgery

Waiting time - hours	No of cases
12-1	6
13-18	22
19-24	16
30-25	5
>30	3

Table 4. Complications of typhoid perforation surgery

Complications	n (%)
Superficial wound infection	15(32.6)
Deep wound infection	1(2.2)
Intra-abdominal abscess	3(6.5)
Re-perforation	2(4.3)
Septicaemia	1(2.2)
Death	10(21.7)
None	11(23.9)
Superficial wound infection+ re-perforation	1(2.2)
Missing data	2(4.3)

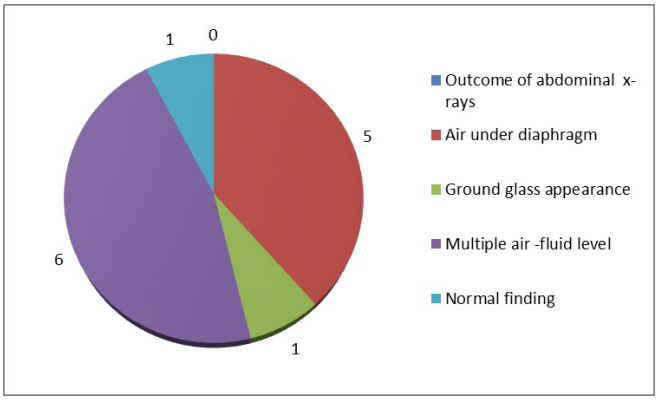

Figure 1. Outcome abdominal x-rays

volume, electrolytes, urea and creatinine, and availability of blood, 31(67.4%) patients did not have any diagnostic radiological investigations prior to surgery. A finding of pneumoperitoneum on plain erect abdominal radiograph confirms intestinal perforation and hence should be done wherever possible. One patient did have a chest x-ray which showed no sub-diaphragmatic air but among twelve who had abdominal x-rays five (41.6% of the 12) showed air under the diaphragm and six showed multiple air/fluid levels on the erect films. This was in contrast to the findings of Chalya et al with 74.7% pneumoperitoneum. [8] The conclusion is therefore that a clinical diagnosis of peritonitis is a sufficient indication for an emergency exploratory laparotomy half of the cases being operated upon based on clinical diagnosis alone. Only 9.6% at laparotomy were negative for typhoid perforation. In one study where both x-rays and abdominal ultrasound scan were done for more than 60% of patients, the authors still recommended that clinical diagnosis and early surgical intervention were keys to good outcomes.[11]

We recorded a mortality of 21.7% which is lower than 28.3%, 39.6%, 28% and 75% in previous studies by Ali et al [5], Van Basten et al [12] and Osifo and Ogiemwonyi [9] respectively. Although lower figures have been reported at 13.09% by Ugwu et al [7] and 16.2% by Agbakwuru.[6] Eleven (23.9%) of the patients did not develop any form of postoperative complication.

Our relatively low mortality rate was believed to be due to the early surgical intervention based on clinical diagnosis and adequate resuscitation before surgery. The majority of our patients were operated upon within the first 18 hours of presentation. Most time spent was on resuscitation of the patients and waiting for theatre space. In situations where radiological investigations are easily accessible the waiting time can be used to do those investigations.

CONCLUSIONS

In view of the high morbidity and mortality of cases of typhoid ileal perforation due to delayed intervention and the relatively low negative laparotomy rate we recorded, we advocate that where urgent radiologic investigations are not available diagnosis of perforation based on clinical features, and especially with a finding of peritonitis, should justify an emergency laparotomy. However adequate resuscitation with fluid replacement pre-operatively is crucial.

References

1. Surgical problems of enteric fever. In: Badoe EA, Archampong EQ, da-Rocha JT. Ed. Principles and practice of surgery including pathology in tropics. 4th edition. Accra, Ghana Publishing Corporation, 2009:678-681
2. Ameh EA. Typhoid ileal perforation in Nigerian children: a scourge in developing countries. Ann Trop Paedtr.1999; 19:267-72.
3. Archampong EQ. Tropical ileal perforation: why such mortality. Br J Surg 1976;63:317-21
4. Uba AF, Chirdan LB, Ituen AM, Mohammed AM. Typhoid intestinal perforation in children: a continuing scourge in a developing country. Paed. Surg. Int 2007;25:33-9
5. Nuhu A, Dahwa S, Hamza A. Operative management of typhoid ileal perforation in children. Afr J paediatr Surg.2010;7:9-13
6. Agbakwuru EA, Adesunkami AR, Fadiora SO, Olayinka OS. A review of Typhoid perforation in a rural African hospital. West Afri J Med 2003; 22: 22-25
7. Ugwu BT, Yiltok SJ, Kidmas AT, Opaluwa AS. Typhoid intestinal perforation in northcentral Nigeria. West Afr J Med, 2005;24:1-6
8. Chalya PL et al. Typhoid intestinal perforation at a University teaching hospital in Northcentral Tanzania: A surgical experience of 104 cases in a resource limited setting. World Journal of Emergency Surgery 2012;7:4
9. Osifo OD, Ogiemwonyi SO. Typhoid ileal perforation in children in Benin City. Afr J Paediatr Surg 2010;7:96-100
10. Weledji EP, Lemoupa SM, Njunda A, Nsagha D, Typhoid perforation associated with rectal bleeding in HIV infected patient, Gastroenterlogy and Hepatology 2014;1(1):11-15
11. Ugochukwu AI, Amu OC, Nzegwu MA. Ileal perforation due to typhoid fever – Review of operative management and outcome in an urban centre in Nigeria. International Journal of Surgery 2013;11(3):218-222.
12. Van Basten JP, Stocken Brugger R. Typhoid perforation: A Review of literature since 1960. Trop. Geogr Med.1994;46.