

ORIGINAL RESEARCH

Management of Typhoid intestinal perforations in a developing country

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Received: 19 September, 2022

Accepted: 24 October, 2022

ABSTRACT

Introduction: In many developing countries, typhoid intestinal perforation is still a common occurrence. Despite improvements in management, these patients' with low resources remain dismal. This study was conducted to understand the management of typhoid intestinal perforations in a developing country.

Material and methods- The patients in this study were those who underwent typhoid intestinal perforation surgery at the government medical college in Jammu. Version 21 of the SPSS statistical package was used to examine the data.

Results- A total of 105 patients were studied with male effected greater than females. Fever and abdominal pain were the most common presenting symptoms. The majority of patients had single perforations and ileum was the most common part of the bowel affected occurring in 88.18% of cases. Exteriorisation of the perforations was the most commonly performed procedure accounting for 76.4% of cases.

Conclusion - In our environment, typhoid intestinal perforation still has a significant morbidity and fatality rate. The goal of this study was to identify the variables that statistically affect typhoid perforation mortality in our environment. To provide these patients with the best care possible in this area, appropriate approaches concentrating on these characteristics are essential.

Keywords- Intestinal perforation, Prognostic factors, Surgical management, Typhoid fever

INTRODUCTION

In many developing nations, typhoid fever, a serious febrile illness predominantly brought on by the gram-negative bacillus *Salmonella typhi*, continues to be a public health issue [1,2]. The majority of the time, typhoid illness spreads orally through the faeces and can occasionally cause an epidemic, especially in places with poor sanitation and little access to clean, drinking water [3,4]. Typhoid fever is a serious worldwide health issue that can have devastating effects on resource-poor nations [5, 6]. It is thought to affect more than 33 million people each year and result in over 500,000 fatalities. Effective public health interventions have helped industrialised countries contain the illness, but developing nations continue to bear the brunt of the disease, largely because many populations still do not meet minimum requirements for drinking water, hygiene, and sanitation [7,8].

Typhoid fever's surgical consequences are a major source of morbidity and mortality in many regions of India, where access to basic medical facilities is still limited [4,6]. Due to poor sanitation, a lack of clean drinking water, a lack of medical facilities in rural locations, and

delays in hospitalisation, intestinal perforation is a major consequence of typhoid fever and continues to be a substantial surgical problem in developing nations [9]. According to published reports, the rates of perforation range from 0.8% to 18% [10-13]. Salmonella typhi strains that are increasingly multidrug resistant and virulent have been blamed for the increased prevalence of perforation in the majority of developing nations [14]. Most of the disease's victims are young adults, who make significant economic contributions to third-world nations [15,16]. Children are also affected, and individuals from poor socioeconomic groups are particularly likely to experience it. General surgeons working in resource-constrained nations face diagnostic and therapeutic obstacles when treating typhoid intestinal perforation.

In order to increase the chances of survival for people with this illness, who typically present late, surgery is thought to be the best course of action [17]. The attending surgeon faces a variety of special obstacles in managing these patients. Many of these patients visit and are treated in rural hospitals, which frequently have extremely few resources. Typhoid intestinal perforation treatment outcomes may be poor, particularly in developing nations where the disease's late presentation, lack of access to clean drinking water, poor sanitation, lack of diagnostic tools, and emergence of multi-drug resistant (MDR) *S. typhi* strains as a result of inappropriate and indiscriminate antibiotic use are among its hallmarks [18]. The prognosis has been reported to be significantly impacted by late presentation, insufficient preoperative resuscitation, delayed operation, number of perforations, and the severity of faecal peritonitis [19,20].

Mortality rates in cases of intestinal perforation following typhoid fever are reported to be between 5% and 62%.[21] Despite the high mortality and morbidity of typhoid intestinal perforation in developing world, relatively a little is known about the pattern of this disease and its prognostic factors in our set up. The present study is conducted to understand the management of typhoid intestinal perforations in a developing country.

MATERIAL AND METHODS

This was a combined retrospective and prospective study of patients who were operated for typhoid intestinal perforation at Government medical college and hospital, Jammu.

All patients who were operated for typhoid intestinal perforation during the study period were included in the study. Patients with incomplete data and those who failed to consent for HIV infection were excluded from the study. Patients who presented to the general surgery department were prospectively enrolled in the study after signing an informed written consent for the study. The diagnosis of typhoid perforation was established by clinical features of typhoid fever and peritonitis which were supported by positive typhoid serology.

Relevant preoperative investigations included packed cell volume, serum electrolytes, urea and creatinine, Chest and abdominal radiographs to detect air under the diaphragm. Abdominal ultrasound was also performed in some patients suspected to have abdominal collections. After resuscitation all patients under general anaesthesia were subjected to exploratory laparotomy.

Data on each patient were entered into a pro forma prepared for the study. The study variables included socio-demographic data (i.e. age and sex, level of education, occupation and area of residence), clinical presentation, radiological finding, perforationsurgery interval, operative findings (such as type of peritonitis, degree of contamination and number of perforations), antibiotics used and surgical procedure performed.

The statistical analysis was performed using statistical package for social sciences (SPSS) version 21.0 for Windows (SPSS, Chicago IL, U.S.A).The mean \pm standard deviation (SD), median and ranges were calculated for continuous variables whereas proportions and frequency tables were used to summarize categorical variables. Continuous variables were

categorized. Chi-square test were used to test for the significance of association between the independent and dependent variables in the categorical variables. The level of significance was considered as $P < 0.05$.

RESULTS

A total of 105 samples data was collected and analyzed after fulfilling the inclusion and exclusion criteria. 70% patients were males and 30% were females. Their ages ranged from 11 to 75 years. The peak age incidence was in the 11-20 years age group accounting for 48% of cases (Table 1).

Table 1: Distribution of age group by gender

Age (in years)	Male (N/%)	Female (N/%)	Total (N/%)
11-20	37 (74)	13 (26)	50 (48)
21-30	17 (65.3)	9 (34.6)	26 (24.7)
31-40	7 (58.3)	5 (41.6)	12 (11.4)
41-50	4 (44.4)	5 (55.5)	9 (8.5)
51-60	3 (2.8)	-	3 (2.8)
61-70	3 (2.8)	-	3 (2.8)
>70	2 (1.9)	-	2 (1.9)
Total	73(70)	32 (30)	105(100)

Fever and abdominal pain were common to all the patients (100%), whereas other clinical features include vomiting (90.4%), diarrhea (84.7%), constipation (77.1%), jaundice (7.6%) and abdominal distention (71.4%). (Table 2)

Table 2: Clinical features of patients with typhoid

Clinical features	Frequency	Percentage
Fever	105	100
Abdominal pain	105	100
Vomiting	95	90.4
Diarrhea	89	84.7
Constipation	81	77.1
Abdominal distention	75	71.4
Jaundice	8	7.6

A total of 110 perforations were identified and ileum was the most common part of the bowel affected and occurred in 87.2% of cases (Table 3). The median size of the perforations was 8.8 mm. The median distance from ileocecal junction was 37 cm. The amount of pus/faecal matter drained from the peritoneal cavity reflected the extent of contamination. The drainage was between 300 and 2000 mls with a mean of 550 mls. It was less than 1100 ml in 16 patients and more than 1100 mls in 99 patients.

Table 3: Distribution of patients according to anatomical site of perforations

Anatomical site	Frequency	Percentage
Ileum	97	88.18
Jejunum	7	6.3
Caecum	3	2.8
Ascending colon	-	-
Total	110	100

Perforations were surgically treated depending upon the number of perforations, general health status of patient and degree of faecal contamination. Exteriorization of the perforations

was the most commonly done procedure accounting for 85.5% of cases and this was generally done in two layers after excision the edges (Table 4). Nine (8.5%) patients had re-operation between 3 rd and 14th day post-operatively. Three (2.8%) patients were re-operated during the follow up period.

Table 4 Type of surgical procedures performed

Surgical procedure	Frequency	Percentage
Simple double layered closure	8	7.3
Bowel resection with anastomosis	4	3.8
Right hemicolectomy + ileo-transverse anastomosis	3	2.8
Exteriorization of perforation with ileostomy	94	85.5
Appendicectomy	1	0.9

DISCUSSION

The most dangerous typhoid fever consequence in underdeveloped countries is intestinal perforation, which poses a challenge to surgeons due to the significant morbidity and mortality it causes as well as its unpredictable course [14, 22]. There are significant regional differences in the disease's incidence [23]. Typhoid intestinal perforation is a symptom of endemic typhoid fever in any area, according to earlier reports [24].

With the exception of Edino et al. [25], who reported a male:female ratio of 0.9:1, our study's ratio was similar to that reported by most research [26,27]. This can be explained by increased exposure due to more time spent away from home and increased consumption of non-homemade cuisine. However, other researches suggest that men have a genetic propensity to typhoid fever and underlying immunological systems.

Fever and abdominal pain was most common clinical feature noted in all patients which was similar to researches done by Chalaya et al and Edino et al [25,27].

Ileum was the most common site of typhoid perforation in the current research, colonic involvement was very rare which is consistent with other studies done by Edino et al and Tade et al [23,27]. Colonic involvement is thought to be caused by direct bacterial invasion, whereas ileal lesions are thought to be caused by enterotoxin produced by parasitized macrophages that led to hyperplasia, necrosis, and ulceration.

The best course of action for perforation treatment is early surgical interference. The kind of operation should be used, though, is debatable. Numerous surgical procedures have been employed, including segmental intestinal resection and primary anastomosis especially in multiple perforations or right hemicolectomy where the caecum is involved, excision of the edge of the ileal perforation, and simple transverse closure in two layers, as done for the majority of our patients. While many studies [28,29] show better outcomes with simple closure, others [30] advocate segmental ileal resection with anastomosis. The ileum damaged by typhoid fever takes sutures well without cutting through, according to those who favour simple closure, who also claim that in such critically ill patients any prolonged treatment may compromise the outcome. Our standard of care for treating these patients entails simple closure for single perforations, segmental intestinal resection, primary anastomosis, right hemicolectomy when the caecum is implicated, and ileostomy for extensive peritoneal contamination. It is still up for debate whether ileostomy should be used as a first-line procedure for typhoid perforation. For patients with extensive peritoneal contamination, it has been suggested to promote intestinal decompression with better healing, early ileus resolution, and an early start to enteral feeding [24,25].

CONCLUSION

In our environment, typhoid intestinal perforation still has a significant morbidity and fatality rate. Typhoid intestinal perforation in this area should be treated with early and suitable

surgical intervention, efficient preoperative resuscitation, postoperative critical care techniques, safe anaesthesia, and administration of wide-spectrum antibiotics with low resistance. The focus should be on preventive measures like typhoid immunisation, safe drinking water, and proper sewage disposal.

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