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Original Research Article

Our experience with enteric ileal perforation: a retrospective study at a tertiary care centre in northern India

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ABSTRACT

Background: Typhoid fever is one of major causes of intestinal perforation in India and is one of the common surgical emergencies for which intervention is required. The study aims to evaluate the clinical presentation, operative findings, outcome of surgical procedures, postoperative complications and associated mortality among the patients managed for typhoid ileal perforation in a tertiary care hospital.
Methods: This was a retrospective study evaluating the patients who were operated for typhoid ileal perforation peritonitis in FH Medical College, Agra, UP, India between April 2017 and September 2019. Diagnosis of typhoid ileal perforation was made with the combination of clinical presentation, laboratory investigations, radiological results and per-operative findings.
Results: In the present study, 57 patients were managed for typhoid ileal perforation. Majority of the patients were young. In our study 40 patients (70.18%) were male and 17 patients (29.82%) were female. All patients presented with pain in abdomen and abdominal distension. However there was no history of fever in 19.3% of patients. Free gas under the right diaphragm was present in 60% of patients. Exploratory laparotomy was done in all the patients and multiple perforations were found in 59.65% of patients. Ileostomy was made in 75% of patients. Most common post-operative complication was wound infection (85.96%) and mortality was 12.28%.
Conclusions: Perforation peritonitis is an alarming complication of typhoid fever which needs urgent and aggressive management. Mortality rate is high (12.28%) and may be attributed to delayed presentation.

Keywords: Typhoid fever, Ileal perforation, Ileostomy, Complications

INTRODUCTION

Typhoid and paratyphoid fevers are major public health problems, especially in the developing world. They are an important cause of avoidable mortality in regions without adequate access to safe water and sanitation.[1] Typhoid fever is caused by gram negative bacillus and is endemic in several areas. According to one estimate in 2010, there were about 13.5 million typhoid fever episodes globally.[2] The most serious complication is typhoid intestinal perforation (TIP), observed in 0.8-39%, with a striking rate difference between high-income and low-middle-income countries.[3] Perforation results in super infection of the peritoneal cavity with gut flora leading to a full-blown peritonitis, with severe peritoneal contamination being associated with a poor prognosis and high mortality.[4] The reasons for the high mortality are multifactorial.[5] In recent years lots of antibiotics and other supportive drugs are available, better patient care including intensive care unit (ICU) facilities are changing the outcome of the disease, still it is a challenge to treat a patient with a good outcome.[6,7]

The objective of the study was to evaluate the behavior and outcome of this dreaded complication of typhoid fever in a tertiary care centre of northern India. In our

study we have evaluated clinical presentation, operative findings, outcome of surgical procedures, postoperative complications and mortality among the patients managed for typhoid perforation peritonitis.

METHODS

The study was done in FH Medical College which is a tertiary care hospital, situated in a rural area of Agra district. The location of this college makes it easily accessible to the villages nearby. In this retrospective study we included patients who were operated in surgery department of FH Medical College for ileal typhoid perforation peritonitis between April 2017 and September 2019. Diagnosis of typhoid ileal perforation was made with the combination of clinical presentation, laboratory investigations, radiological results and per-operative findings.

All of the patients in our study presented in the emergency department and were admitted to the emergency ward. A detailed history was taken and physical examination was done. It was followed by X-ray abdomen anteroposterior view in erect or sitting posture. Urgent ultrasound and/or computed tomography scan abdomen was also done as per need. Blood investigations include complete blood count, blood sugar, kidney function tests, liver function tests, Widal test and enzyme-linked immunosorbent assay test for typhoid, viral markers for hepatitis B, C and HIV were also done.

Resuscitation of the patients was done and electrolyte imbalance was corrected if needed. Broad spectrum antibiotics were started, and Ryles tube and Foleys catheter were inserted.

A central line was placed to monitor the central venous pressure and volume status of the patients as per the need. After adequate resuscitation exploratory laparotomy was done.

Operations were done as per the protocol of the institution. During surgery, on opening the peritoneum, presence of gas was noted. Soiling of peritoneal cavity and pelvis was noticed. Presence of intestinal contents and pus was also documented. The condition of bowel was also checked carefully for the presence of inflammation or gangrene. Whether there was only a single perforation or multiple perforations was also noted.

Perforation was sealed with delayed absorbable sutures if the condition of bowel was found to be satisfactory. However, if marked inflammation was present, if perforation was present near ileo-caecal junction, multiple perforations were present, gangrene of bowel was noted or massive contamination was noted, then ileostomy was performed. Biopsy of perforation margin was sent for histopathological examination. Peritoneal collection was also sent to the laboratory for culture and sensitivity for organisms present.

Postoperatively patients were kept in the post-operative ward or surgical ICU depending on their condition. Intake and output charting was done and antibiotics were continued and changed if needed according to culture report. Electrolytes and other biochemical parameters were tested regularly and corrected if required. Post-operative complications were also recorded and were managed accordingly.

RESULTS

In our retrospective study 57 patients of typhoid ileal perforations were operated in the department of General Surgery, FH Medical College, Agra in between April 2017 to September 2019.

Majority of patients in our study were young, and maximum were in the age group of 21-30 years.

Table 1: Age distribution of our patients (n=57).

Age (in years)	No. of cases	%
0-10	0	0.00
11-20	5	8.77
21-30	23	40.35
31-40	14	24.56
41-50	7	12.28
51-60	6	10.53
>60	2	03.51

In our study 70.18% of patients were males and 29.82% of patients were females.

Table 2: Sex distribution of our patients (n=57).

Sex	No. of cases	%
Male	40	70.18
Female	17	29.82

All patients presented with pain in abdomen and abdominal distension. However history of fever was present in 80.7% of patients.

Table 3: History of fever (n=57).

History of fever	No. of cases	%
Present	46	80.7
Absent	11	19.3

Table 4: Number of perforations in ileum (single or multiple) (n=57).

No. of perforations	No. of patients	%
Single	23	40.35
Multiple	34	59.65

60% of our patients had free gas under the right diaphragm.

Intraoperatively 34 (59.65%) of our patients had multiple perforations. Of these six patients had gangrene of bowel also.

In our study ileostomy was done in about 75.44% (43 patients). Out of these 43 patients, 37 patients survived. In our study overall mortality was 12.28%.

Table 5: Surgery with or without ileostomy (n=57).

Ileostomy done	No. of cases	%
Yes	43	75.44
No	14	24.56

Table 6: Survival of patients with or without ileostomy (n=57).

	Patients		
	Total	**Survived**	**Expired**
Ileostomy	43	37	6
Primary repair	14	13	1

Table 7: Incidence of complications.

Complications	No. of patients	%
Wound infection	49	85.96
Burst abdomen	12	21.05
Post-operative respiratory problems	22	38.60
Abdominal collections	7	12.28
Ulceration around ileostomy	25	43.86
Faecal fistula	1	1.75
Prolonged paralytic ileus	18	31.58

Table 8: Survival of overall patients.

Survival	No. of cases	%
Yes	50	87.72
No	7	12.28
Total	57	100

DISCUSSION

Typhoid fever produces hyperplasia of the reticuloendothelial system especially in the Peyer's patches causing its necrosis and ulceration. The preponderance of Peyer's patches in ileum, which is the common site of ulceration, might explain the high proportion of perforations occurring in the terminal ileum. Recent insights into the pathology suggest the mechanism of intestinal injury complicating enteric fever to be immunologically mediated, through release of cytokines from macrophages which are activated by *Salmonella typhi* directly by their Toll-like receptors or indirectly through antigen presenting cells.[8]

Intestinal perforation leading to peritonitis is a common presentation of ill-treated or virulent typhoid fever in India, a tropical country. It concerns us even today as still it is associated with high morbidity and mortality. It commonly affects young persons in their twenties and thirties. In west perforation peritonitis is common in older age groups of 45-60 years.[9] Complication rates are much high when we compare typhoid perforations with other causes of perforation.[10] Mortality increases if the time interval between perforation and intervention increases.[11]

In our study we have evaluated the clinical presentation, operative findings and outcome of patients operated for typhoid ileal perforation peritonitis. Most of our patients are from poor farming villages and reported to us late in course of the disease, over 7 days after the onset of abdominal symptoms. Patients were treated in small villages by local practitioners. They came to a tertiary care hospital only once the condition of patient was critical and moribund. This was the reason that most of the patients had established septicemia when they reported to us. They also had well developed generalized peritonitis and fecal and purulent contamination of peritoneal cavity. The general condition of patient, history of disease, presenting clinical features made the clinical diagnosis of perforated peritonitis easy in majority of patients.

Majority of patients in our study were young, and maximum were in the age group of 21-30 years (40.35%). In our study 70.18% of patients were males and 29.82% of patients were females. Chayla et al in there study on TIP reported 72.1% male patients and 27.9% female patients. In their study peak incidence was in the 11-20 years age group accounting for 47.1% of cases.[12]

In our study in 19.3% of patients there was no history of fever. Pujar et al in there study reported no history of fever in 10% of patients.[13]

In our series about 60% of our patients (34 patients) had free gas under right dome of diaphragm in X-ray abdomen anteroposterior view erect. Absence of gas in rest of the cases may be due to delayed presentation of patients with subsequent sealing and reabsorption of free gas from abdomen.

12.28% of our patients died in spite of best of care, antibiotics, ileostomy etc. We attribute it as delayed presentation for treatment, high grade of septicemia, post-operative chest infection and gross wound site infection.

Conservative treatment was tried in the past but now it is certain that some form of surgical intervention is required to save the patient, but there is no agreement over the type of surgical procedure required.[14,15] Real outcome is dependent over pre-operative condition of patient, per-operative findings and post-operative care.[16] Surgery is

done as soon as the general condition of patient permits the surgeon to go ahead.[17-20]

Most important from patient point of view is the time interval between surgery and actual perforation. Surgical intervention should be done as soon as possible. Up to 70% of perforation patients have massive peritoneal contamination, which increases with time interval. Early operation prevents drastic surgery also. More the time interval, more will be the contamination in peritoneal cavity. It leads to more hypovolemia, more peritonitis, increased intensity of septicaemia shock and low outcome.[17,21-27]

For all our patients we performed an exploratory laparotomy with peritoneal toilet and drainage followed by loop ileostomy. Though other surgeries can be done-primary closure of perforation in two layers, resection and anastomosis, primary closure with ileo-transverse bypass or to put an initial peritoneal drain in patients who are poor candidates for surgery with hope to perform definitive surgery when the systemic condition of the patient permits.[19,20,28-30]

Primary closure may be preferred when there is a single perforation associated with good condition of bowel and less peritoneal contamination. But it has the looming danger of gaping of repair and formation of faecal fistula. On the other hand, ileostomy patients may have ileostomy related complications i.e., ulceration around ileostomy, malnutrition and requirement of a second surgery. Hence, the choice of surgery is at the discretion of the treating surgeon. Due to our experience with the procedure we preferred a loop ileostomy for our patients.

We faced the complications which are reported in literature like chest infection (38.6%), paralytic ileus (31.58%), laparotomy wound site infection (85.96%), burst abdomen (21.05%), faecal fistula (1.75%), intra-abdominal abscess (12.28%), and ileostomy related complications (43.86%) and mortality (12.28%).

As most of our patients reported to us late and with complications, we think improvement in health services is required especially in rural areas. Local practitioners should be trained to identify the crucial manifestations, so the early referral to a higher surgical center can prevent much mortality.

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