ORIGINAL ARTICLE

Perforation-operation interval as a prognostic factor in Typhoid ileal perforation

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Abstract:
Objective: To find out significance of perforation-operation interval in relation to early prognosis in patients with peritonitis due to Typhoid ileal perforation.
Study design: Prospective study.
Place and duration: The study was conducted in the Surgical Department of Khyber Teaching Hospital Peshawar from 25th February 2005 to 30th January 2006.
Patients and methods: The study included 50 patients with typical history of typhoid fever presenting with generalized peritonitis diagnosed as typhoid ileal perforation on clinical and radiological grounds. All patients with generalized peritonitis due to non typhoid ileal perforation like trauma, tuberculosis, ulceration and malignancy were excluded from the study. Data was collected in the proforma designed for the study.
Results: There were 35 males and 15 females with mean age of 33.5 years. Fever, abdominal pain, vomiting and constipation were common symptoms while abdominal distention, abdominal tenderness, guarding, silent abdomen on auscultation and pulse rate >90/mimute were the common signs. Depending upon the time between perforation/peritonitis and operation we divided the patients into 3 groups i.e. Early, Late and Very late. Mean duration of perforation-operation interval was 34.8 hours. A total of 8 (16%) patients developed complications and wound sepsis was the most common which occurred in 4 (8%) patients. Only one (2%) patient from Early group developed wound sepsis. Post operative hospital stay ranged from 7 to 11 days with a mean of 9.2 days (standard deviation: 1.03). No mortality was seen in our study.
Conclusion: Typhoid ileal perforation is associated with decreased morbidity and mortality if recognized and presented early followed by aggressive resuscitation and early surgery in expert hands.

Key words: Typhoid ileal perforation, perforation operation interval, prognosis.

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Introduction:
Typhoid fever is still endemic in Pakistan due to poor sanitation, lack of health education and lack of immunization against salmonella. 452 per 100,000 persons are affected per year with a mean age of onset at 8.5 years [1].

Being a generalized infection it affects every part of the body but the common and most dreadful complications are ileus, hemorrhage and perforation of the bowel- most commonly the terminal ilium but very rarely large bowel [2]. It is secondary to necrosis and ulceration in the hyperplastic Peyer's patches [3]. Typhoid ileal perforation is recognized as a major cause of morbidity globally with over 16 millions cases worldwide and an estimated 580,000 deaths [4]. Incidence of Typhoid ileal perforation has been reported to be between 0.8 and 18%, the highest reported is in west African regions- 15 to 33% [5].

Incidence in our set up is not known but is expected to be high due to late diagnosis and existence of virulent strains of salmonella typhi [6].

Although no age is exempt; it is more common in young adults, uncommon in children and very rare in infants [7]. Different studies show variable incidence of male to female ratio like 5:1 [8] and 3:1 [9].

The morbidity ranges between 9 to 43% with survivors having wound infection and long hospital stay. A mortality range of 4 to 80% has been reported [10].

Three adverse prognostic factors in Typhoid ileal perforation are prolonged illness (fever)-perforation interval, prolonged perforation-operation interval and presence of multiple perforations [11].

Early diagnosis and treatment avoids extensive procedures and is associated with low morbidity and mortality [12]. Mortality increases rapidly after 2nd day of perforation and after 5th day it is as high as 76% [13].

The aim of this study was to highlight the importance of perforation-operation interval and its effects on the early outcome of typhoid ileal perforation as a prognostic factor.

Patients and methods:

The study was conducted from February 2005 to January 2006 and a total of 50 patients with typhoid ileal perforation were recruited.

Diagnosis was made on the basis of typical history and clinical examination, supported by radiological as well as laboratory investigations and confirmed by operative findings.

Isolation of salmonella typhi and histopathological examination of the specimen were retrospective investigations.

The time of onset of severe symptoms of acute abdomen like abdominal pain, distension, vomiting and constipation was noted and the interval between this and the time of operation was calculated. According to this we divided our patients in three groups. The "Early Group" patients presented within 24 hours of the onset of perforation, the "Late Group" within 48 hours while the "Very Late Group" patients presented after 48 hours.

All patients had intravenous fluids, nasogasteric decompression, antibiotics (2nd generation Cephalosporin along with metronidazole) and per urethral catheterization.

Blood was transfused to those with less than 8 g/dl hemoglobin.

After thorough resuscitation, all patients under went exploratory laparotomy via a midline incision. Diagnosis was confirmed and pus, faecal matter were drained.

Primary closure in double layer in transverse axis with vicryl-2/0 and chromic cat gut-2/0 was done after trimming the ulcer margin in all patients. Thorough peritoneal lavage was done after taking biopsy from ulcer margin and peritoneal fluid for culture and sensitivity. Mass closure of abdomen was done with proline-1 while skin was close with proline-2/0.

Patients were closely observed for any complication and the course of morbid condition. Study variables like perforation-operation interval, operative findings, operative procedures performed, postoperative morbidity and postoperative hospital stay were analyzed to determine their influence on the outcome.

Mean, median and standard deviation where applicable was computed by using SPSS version 11 for interpreting the results, measuring the characteristics of the primary data.

Results:

The age ranged between 15-64 years (mean: 33.5 years, median: 32.83 years and standard deviation: 10.2 years). 35 (70%) patients were males while 15 (30%) were females (M: F=2:1). Young adult males (25-44 years) were common victims in our study.

Common symptoms were fever (100% patients), vomiting (94% patients) and constipation (66% patients), while abdominal distention (100% patients), tenderness (100% patients)

Table 1: *Age distribution (n=50)*

Age (years)	No of patients	Percentage
15-24	10	20
25-34	18	36
35-44	16	32
45-54	4	8
55-64	2	4

Table 2: *Sex distribution (n=50)*

Sex	No of patients	Percentage
Males	35	70
Females	15	30

Table 3: *Perforation-operation interval (n=50)*

Time interval (hours)	No of patients	Percentage
24	9	18
24-48	36	72
49-72	5	10

Table 4: *Postoperative complications (no=50)*

Complications	No of patients	Percentage
Wound sepsis	4	8
Subphrenic abscess	1	2
Ileus/obstruction	1	2
Recurrence	1	2

and a pulse rate >90/minurte (51%) were common signs. 73% patients had guarding and 71% patients silent abdomen on auscultation.

9 (18%) patients were operated upon within 24 hours (Early group), 36 (72%) patients within 48 hours (Late group)and only 5 (10%) patients were operated upon after 48 hours of the onset of perforation (Very late group).

The mean duration before operation in our study was 34.84 hours.

Only one (2%) patient from the "Early group" developed wound infection. In the "Late group" 3 (6%) patients developed wound sepsis and one (2%) sub phrenic abscess while in the "Very late group" one (2%) patient developed subphrenic abscess, one (2%) went into obstruction due to ileus and one (2%) patient re-perforated leading to generalized peritonitis. 6 (12%) patients stayed in hospital for 7 days, 28 (56%) patients for 9 days, 16 (32%) patients belonging to the "Late/Very Late Group" stayed for more than 9 days.

Although no mortality was observed in our study, it was observed that perforation-operation interval had strong influence on the incidence of postoperative complications.

Discussion:

Males were in preponderance to females with a mean age of 35 years in our study coinciding to the findings of Butler et al [14] and Arjan JB et al [15]. Patients with an age range of 25 to 44 years were the common victims as seen in previous studies [16].

We divided our patients into three groups on the basis of time interval between perforation/peritonitis and operation which was 34.84 hours. A limiting factor of 48 hours was set for early and late cases in their study by Rehman A and Nawaz M who documented a trend towards better outcome in group A where primary closure after wedge excision of perforation was done[17]. Illness-perforation and perforation-operation interval has significant effect on prognosis [18].

Wound sepsis was the common complication in our study followed by sub phrenic abscess, obstruction due to ileus and re-perforation leading to generalized peritonitis.

We observed that most of post operative complications developed in those patients who presented late after the onset of perforation/peritonitis. Various studies have found same effect of perforation-operation interval on the morbidity and mortality [10,19].

Increased perforation-operation interval lead to greater bowel inflammation and edema causing greater friability and increased difficulty in handling and suturing the bowel at operation [20]. Also it has been found that in severely contaminated cases with delayed presentation, the incidence of most deadly complication like fecal fistula increases causing a direct increase in morbidity and mortality [21].

Primary closure in double layers was the proce-

dure of choice in our study.

A quick, swift, single stage procedure thought to be the reason of absence of drastic complication like faecal fistula in our study as supported by Muray et al [22].

Mean hospital stay in our study was 9.1 days while 16 (32%) patients belonging to "Late/ very late group" stayed for more than 9 days. This was comparable to the 12.3 days stay reported by Rehman A [17] while a stay of 20 days and 70 days was reported by others [23,24].

No mortality was seen in our study which was among others due to proper selection and preparation of the patients who presented with short history of illness, short perforation-operation interval and satisfactory operative findings. This was supported by various studies [25,26].

Conclusion:

Typhoid ileal perforation is a drastic complication of typhoid fever with a high morbidity and mortality. Once diagnosed it needs early and aggressive management to achieve optimum results. The results of this study support the aforementioned protocol which avoids the adverse effects on the outcome of surgical treatment and postoperative hospital stay.

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