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 (POI) in relation to early prognosis in patients with peritonitis due to typhoid ileal perforation (TIP).*

Study design — *Case series.*

Place & Duration of study — *Department of General Surgery, Jinnah Postgraduate Medical Centre (JPMC) Karachi, from October, 2004 to March, 2007.*

Patients and Methods — *The study included 92 patients with generalized peritonitis diagnosed as typhoid ileal perforation fulfilling the inclusion criteria. All non typhoidal and traumatic perforations were excluded from the study. Data was collected in the proforma designed for the study. The diagnosis of typhoid ileal perforation was established on the basis of history, clinical examination, radiology, isolation of Salmonella Typhi, and a positive Widal test. Histopathological confirmation of the diagnosis was also made.*

Results — *Out of 92 patients, 75 were males (81.5%) and 17 (18.5%) females, with male to female ratio of 4.4:1. The ages ranged between 15 to 50 years. The most common symptoms were fever (100%), abdominal pain (100%), constipation (81.5%), vomiting (76%) and distension of abdomen (69.5%). The most common signs elicited on abdominal examination were tenderness (100%), guarding (72.8%) and absent gut sounds (65.2%). Out of 92 patients 12 patients (13%) presented within 24 hours of onset of severe abdominal pain (Group A). Among late presenters, fifty nine (64.1%) patients presented 25-72 hours after severe abdominal pain (Group B) and twenty one patients (23%) presented after 72 hours (Group C). Mortality was highest among group C patients (8/21;38%), while the mortality among the late presenters (Group B) was 10.2% (6/59). There was no mortality in the early presenters (Group A). Overall mortality was 15.2% (14/92). The average perforation operation interval in survivors was 44.2 hours as compared to average of non-survivors - 63.9 hours ($p < 0.01$).*

Conclusions — *Prolonged presentation time leads to a high mortality rate. Once intestinal perforation occurs, early recognition, early referral and aggressive management could decrease the high mortality.*

Key words — *Typhoid ileal perforation, Perforation-operation interval, Prognostic factor.*

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INTRODUCTION:

Typhoid fever is a systemic infection caused by the bacterium Salmonella Enterica serotype Typhi. According to worldwide estimates, there are at least 16 million new cases of typhoid fever every year with 600,000 deaths.[1] Typhoid ileal perforation, the most lethal complication of typhoid is still very common in the

developing countries and is associated with a high morbidity and mortality. The incidence of TIP has been reported to be between 0.8% and 18% and in West African region the incidence has been reported to be 15% to 33%, the highest in the world.[2] The morbidity ranges between 9% to 43% with survivors having wound infection and long hospital stay. A mortality rate of 4% to 80% per cent is reported in various studies.[3-5]

Many factors such as late presentation and delayed operation have been found to have a significant effect on the prognosis. [3, 6] Early diagnosis and treatment avoids extensive procedure and is associated with low morbidity and mortality.[2, 7] The present study is conducted to highlight the significance of perforation-operation interval as a prognostic factor in determining the early outcome of TIP management.

PATIENTS AND METHODS:

This study was carried out in the department of General Surgery, Jinnah Postgraduate Medical Centre, Karachi, over a period of two and a half years from October, 2004 to March, 2007. All patients with non typhoid ileal perforations including tuberculosis and traumatic perforations were excluded from the study. The diagnosis of typhoid ileal perforation was clinical, supported by culture, serological reports, operative findings and histopathological examinations of specimen retrieved. The diagnosis of typhoid fever was further established on isolation of Salmonella Typhi, and a positive Widal test.

Perforation –operation interval was calculated from the time of onset of severe symptomatology like exacerbation of abdominal pain, distension and vomiting till the time patient was operated. Based on this information patients were divided into three groups A, B, and C (less than 24 hours, 25-72 hours and more than 72 hours respectively). Relationship of the perforation operation interval with the outcome of the disease was highlighted with comparison of proportions using Chi-square test where it was applicable with the help of x2=E(o-e)2/e at row 1 column 1 degree of freedom. For the invalidity of Chi-square statistic, alternate test statistics were used as Yate's correction and Fisher exact test. The database for the study was developed in Epi info 6, version 6.0.2, a word processing database and statistical program for public health.

RESULTS:

Out of 92 patients, 75 were males (81.5%) and 17 (18.5%) females, with a male to female ratio of 4.4:1. The ages ranged between 15 year to 50 years. The average age in males and females was 26.9 years and 26.3 years, respectively. The highest number (45.7%) of typhoid perforation was observed in the 20-29 years age group in both sexes. The most common symptoms were fever (100%), abdominal pain (100%), constipation (81.5%), vomiting (76%) and distension of abdomen (69.5%). The most common signs elicited on abdominal examination were tenderness (100%), guarding (72.8%) and absent gut sounds (65.2%).

Out of 92 patients 12 patients (13%) presented within 24 hours of onset of severe abdominal pain (Group A). Among late presenters, fifty nine patients (64.1%) presented 25-72 hours after severe abdominal pain (Group B). Twenty one patients (23%) presented 72 hours after perforation (Group C). Mortality was highest among group C patients who presented more than 72 hours after severe abdominal pain (8/21; 38%), while the mortality among group B patients was 10.2% (6/59). There was no mortality in group A. Overall mortality was 15.2% (14/92). The average perforation operation interval in survivors was 44.2 hours as compared to average perforation operation interval of non-survivors, which was 63.9 hours ($p < 0.01$). The difference in the two groups of patients was highly significant.

DISCUSSION:

The time of perforation was determined based on the onset of acute abdominal pain preceded by symptoms and signs of typhoid fever.[8,10] In some patients especially the elderly, the development of acute abdominal pain is often gradual, making diagnosis difficult, leading to high degree of peritoneal contamination and thus mortality.[11] The average age of 26 years for our patients is not different from previous series.[9] A high male to female ratio was observed for which a definite explanation cannot be given. It is possible that men have an increased risk of exposure to typhoid bacillus as they spend more time than women in outdoor activities and more often eat outside.[6] Classically, perforation occurs in the second or third week of illness.[6, 9] Severe and sudden abdominal pain corresponds to the time of intestinal perforation. Perforation is often not appreciated in the severely ill patient and super infection with intestinal contents results, leading to a full blown peritonitis.[9, 12]

Severe peritoneal contamination is associated with a poor prognosis with a mortality ranging between 28% and 80%.[4,13] Our results have been similar to the results of other authors and a mortality of 38% occured in group C, the severely contaminated cases with POI more than 72 hours. Recent studies from Turkey showed a mortality of 23.5% in the group with severe peritoneal contamination and have found POI >48 hours to be an independent prognostic factor in determining early mortality.[6,14]

An important prognostic factors identified in the present

study is the POI. A careful history and assessment of the extent of the clinical signs and severity of the operative findings provide useful guidelines in determining the POI.[7] A progressively increasing POI leads to a progressively higher morbidity and mortality rate. Most of our patients presented in the Accident & Emergency Department after 24 hours of perforation and among the very late, Group C patients (POI >72 hours), the mortality was close to 40%. No mortality was observed in the early presenters (POI <24 hours). A high POI leads to a higher mortality due to a delay in institution of treatment with resultant toxemia, shock, decreased host resistance and multi organ failure. Various other studies over the time have also found a similar relationship between an increasing POI and mortality, strengthening the relationship between POI and mortality.[4, 5]

As the POI increases, there is greater bowel inflammation and edema causing greater friability and increased difficulty in handling and suturing the bowel at operation.[7] The volume of pus and faecal matter drained from the peritoneal cavity reflects the extent of contamination and peritonitis. In one study drainage of more than 1000ml was associated with a 100% early mortality. [4] In the present study similar observation was made. There was a high mortality (53.8%) in cases where the total peritoneal drainage exceeded 1500 ml. In severely contaminated cases with delayed presentation the incidence of most deadly complication like faecal peritonitis and fistula also increases causing a direct increase in morbidity and mortality.[8] Septic shock ensues and multi organ failure is the indirect consequence of delayed presentation and a prolonged POI leading to a high mortality. [13, 16]

In severely contaminated cases with friable terminal ileum, especially those patients with a prolonged POI, something more than mere closure of the perforation needs to be done in order to reduce the high incidence of faecal peritonitis and faecal fistula. It is suggested that a protective ileostomy should be employed in order to reduce the immediate mortality due to faecal peritonitis.[8] In the present study eight patients had ileostomy made either as protective after primary repair of the perforation or after resection – anastomosis of the diseased part of the ileum. This was a group of patients having POI of more than 72 hours. There was a relatively high mortality in this group (38%; 8/21). A high mortality (5 /21; 23.8%) was seen in patients when no covering ileostomy was performed. Only two patients with covering ileostomy died. Conversely, a mortality of 10.2% (6 out of 59) was seen among the late presenters (Group B) with no mortality among the early presenters.

In the present study POI was found to have a truly significant value as a prognostic indicator of early mortality in typhoid ileal perforation ($p<0.01$) at a confidence interval of 99% (Yate's corrected chi-square test.) These results are in agreement with the results obtained by other authors.[14, 17]

CONCLUSIONS:

The problem of enteric fever and its dreaded complications must ultimately be solved by preventive measures. Prolonged presentation time and consequently increased POI leads to a high mortality rate. Once intestinal perforation occurs, early recognition, early referral and aggressive management (minimal POI) of these patients could decrease the high mortality.

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