



OUTCOME OF VARIOUS SURGICAL PROCEDURES AND THEIR OUTCOME FOLLOWING ENTERIC PERFORATION AT DR. RUTH KM PFAU, CIVIL HOSPITAL, KARACHI.

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INTRODUCTION

Typhoid fever caused by *Salmonella typhi*, gram negative bacteria, transmitted by faeco-oral route.¹ It infects around 21.6 million people worldwide with an incidence of 3.6 per 1,000 population. The expected mortality because of typhoid fever is 200,000 people every year. Nearly 80% of its victims belong to South Asian countries like India, Bangladesh, Pakistan, China, Indonesia, and Nepal.² Its high contribution from the developing world correlates with miserable socioeconomic circumstances, overpopulation, lack of clean drinking water and deprived hygienic conditions.³ Uncomplicated typhoid fever treated conservatively with antibiotic has a mortality rate is less than one percent.² If left untreated, can result in life threatening complications amongst which perforation with peritonitis (1-3%), gastrointestinal bleeding (10-20%) commonly present during the second or third week of illness, secondary to necrosis of Peyer's patches

ABSTRACT... Objectives: To observe the outcome of various surgical procedures opted in patients presenting with peritonitis, following typhoid perforation. **Study Design:** Prospective observational study. **Setting:** Single surgical unit, Dr. Ruth K.M.Pfau, Civil Hospital, Karachi. **Period:** 37 months from December 2014 to December 2017. **Material and Methods:** 25 patients who were admitted from emergency department with the clinical diagnosis of peritonitis following typhoid perforation. The diagnosis of typhoid peritonitis was confirmed on histopathology with the finding of chronic inflammation not associated with granuloma/ giant cell and malignant cells. **Results:** Out of 25 patients there were 19(76%) male and 6(24%) female patients. The mean age \pm standard deviation (SD) was 29.52 ± 15 years. Fever and abdominal pain was present in all patient. Generalized peritonitis was present in 23(92%), single perforation at terminal ileum was found in 23(92%). Whereas, loop ileostomy was the commonest procedure performed 14(56%) of patients. En masse abdominal wall closure was performed in 22(88%), however, skin closure was only possible in 11(44%) of the patients. Wound infection was common complication noted 21(84%), whereas 2(8%) patients died during treatment. **Conclusion:** With reference to morbidities and mortality loop ileostomy seems to be have a good outcome.

Key words: Clinical Outcome, Surgical Procedures, Typhoid Intestinal Perforation.

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at terminal ileum.^{4,5} Frequently, untreated typhoid fever has a mortality rate of around 10%-20%.² Surgery is the treatment of choice in typhoid peritonitis. Various surgical options are primary repair of the perforation, simple repair with proximal ileostomy, resection of disease segment and anastomosis, exteriorization of perforation as loop ileostomy, bypass the perforation as ileo-transverse anastomosis, resection of perforated segment followed by exteriorization of both ends of affected bowel.^{1,4,6,7,8} The prognosis in patients suffering with typhoid fever depends primarily on the rapid diagnosis and beginning of effective treatment. This is the reason, surgical outcome is strongly influenced by either because of delay in diagnosis, delay in referral to tertiary care center or prolonged postponement of surgery, which eventually increases the percentage of morbidity and mortality. Surgery in this regard required to select the appropriate procedure according to the clinical presentation and operative findings

for any patient.³

The object of this study is to observe various surgical procedures and their outcome in patients presenting with peritonitis, secondary to typhoid perforation.

METHODS

This prospective, observational study was conducted in surgical unit: V, Dr. Ruth K.M.Pfau, Civil Hospital, Karachi, over a period of 37 months from December 2014 to December 2017. A total of 25 operated cases of patients presenting with history of fever and abdominal pain followed by clinical diagnosis of peritonitis, were included in the study by simple consecutive sampling technique. Patients suffering from chronic infectious conditions like tuberculosis, malignancy, traumatic perforation, patients on steroid and those operated at other center then referred to our center were excluded from the study. Informed consent was obtained from all the patients included in the study.

The clinical diagnosis of peritonitis was made on history of fever followed with abdominal pain, abdominal distension, tenderness, guarding or rigidity, supported with pneumoperitoneum on plain erect chest radiography, and on operative finding of terminal ileal perforation. During preoperative resuscitation all patients received intravenous third generation cephalosporin with metronidazole, nasogastric tube, urethral catheterization, then shifted to emergency operation theatre for laparotomy under general anesthesia. The decision of surgical treatment option for ileal perforation was taken at surgeon's discretion according to case to case operative findings. In all cases peritoneal cavity was thoroughly washed with copious amount of warm normal saline and drain placed in pelvis. Abdomen was closed either by en masse with prolene no.1. Whoever, in severely contaminated cases deep tension suture technique with prolene no. 1, was used to close the abdomen. Skin was closed with interrupted prolene 2/0 sutures and in particularly contaminated cases skin was left open.

Post-operatively patients were kept nil per orally

with nasogastric tubes till return of bowel sounds or no stoma output in patients where stoma was formed. On the other hand, patients in which primary repair was done kept nil per orally for a period of four days followed by liquids then solids. Diagnostic confirmation of typhoid ileal perforation was made on histopathological analysis of biopsy from the edge of ileal perforation. Patients were discharged for weekly follow up for one month, with subsequent follow up was continued on monthly basis for next two months. Patients requiring reversal of stoma were then readmitted at the end of three months. Following reversal of stoma same protocol of follow up was observed as mentioned above for primary surgery. All data including demographic details like age, sex, along with supportive investigations for peritonitis (x-ray chest, erect/ supine plain x-ray abdominal film, complete blood picture, etc.), operative findings, procedure performed, morbidity, mortality and total duration of hospital stay were recorded through a proforma. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 15. Descriptive statistics like frequency, percentage, mean etc. were calculated.

RESULTS

During thirty-seven months' period 25 patients were admitted with the clinical diagnosis of typhoid ileal perforation. The study showed a male predominance with 19 males and 6 females, with male/female ratio was 3:1. Table-I The mean age was of 29.52 ± 15 standard deviation (SD) years. Table-II The fever followed by abdominal pain were the commonest symptoms, with the mean duration for febrile illness and abdominal pain were 7 and 5 days. Table-III Majority of the patients presented 24 hours after the development of peritonitis. Generalized peritonitis was found in 23(92%) of patients. The most common operative finding was solitary perforation in the terminal ileum in 23(92%) cases, whereas multiple perforations were found in 2(8%) patients. Table-IV The mean distance of perforation from ileo-caecal junction was 41.32 ± 25.6 SD. Loop ileostomy was the commonest procedure performed 14(56%) of patients. En masse abdominal wall closure was performed in 22(88%), however, skin was closed in only 11(44%). Wound infection was common

complication noted but unfortunately 2(8%) patients died during treatment. (Table-V)

Male	19 (76%)
Female	06 (24%)

Table-I. Gender distribution

Age groups(Years) Mean ± SD: 29.52± 15	Number of patients (Percentage)
13-20 years	10(40%)
21-30 years	8(32%)
31-40 years	2(8%)
41-50 years	2(8%)
51-60 years	2(8%)
Equal to & greater than 70 years	1(4%)

Table-II. Age distribution

Likely duration of peritonitis at Presentation in terms of hours	Within 24 hours:09 More than 24 hours:16
Abdominal Symptoms	
Fever	25(100%)
Abdominal pain	25(100%)
Vomiting	17(68%)
Absolute / relative constipation	17(68%)
Abdominal distension	13(52%)
Diarrhea	6(24%)
Nausea	3(12%)
Duration of fever in days	Mean± SD: 7.08± 2 Median: 7
Duration of abdominal pain in days	Mean± SD:5.04±5.51 Median:3
Clinical presentation of peritonitis	Generalized: 23(92%) Localized: 2(8%)

Table-III. Symptoms

Site of perforation	Terminal ileum
Number of perforations	Single: 23(92%) Multiple: 2(8%)
Distance from ileocaecal junction in centimeter	Mean ±SD:41.32±25.6 Median: 30 Mode: 30 Range: 85(5-90)
Enlarge mesenteric lymph nodes	2(8%)
Procedure Performed	
Loop ileostomy	14(56%)
Primary repair with covering ileostomy	3(12%)
Ileocaecal resection with exteriorization of both ends of bowel	4(16%)
Primary repair	4(16%)
Technique of Abdominal Closure	
Deep tension sutures	3(12%)
En masse closure	22(88%)
Skin closure	Yes: 11(44%) No: 14(56%)

Table-IV. Operative findings and procedure performed

1	Wound infection	17(68%)
2	Chest infection	5(20%)
3	Burst abdomen	5(20%)
4	Wound dehiscence	2(8%)
5	Skin excoriation	2(8%)
6	Death	2(8%)
7	Incisional hernia	1(4%)
8	Stoma retraction	1(4%)
9	Stoma prolapsed	1(4%)

Table-V. Morbidities and mortalities

DISCUSSION

This young male predominance study was similarly comparable with the study conducted by Sumer A. and Sheshe AA.^{5,9} Our hospital is a tertiary care center and patients came from all over the province of Sindh. They are treated initially at primary or secondary health care centers and present to us after a delay with clinical presentation of peritonitis. This corresponds with the study carried out by Ugochukwu AI, in which more than half of the patients presented after 24 hours.⁶ This late stage is associated with septic shock and later on multi organ failure, which is has high morbidity and mortality rate. Our study showed that three patients presented in septic shock, out of which two later on expired in postoperative period because of sepsis and multi organ failure. This was despite vigorous preoperative resuscitation and postoperative ventilator intensive care facility. This outcome is similarly comparable with Chaudhary P.⁴ Symptoms of fever, abdominal pain, vomiting and signs of peritonitis in this study were also noted in other studies.^{7,10,8} The common second week presentation of typhoid ileal perforation of our study were also showed in other studies.^{11,12} This difference of earlier appearance of peritonitis in developing from developed countries seems to be because of decrease immunity, enormous disease burden along with virulent difference leading to increase ileal bacterial load with repeated infection causes Peyer's patches hypersensitivity.^{13,14} All patients were diagnosed as generalized peritonitis with only two patients in which clinical diagnosis of localized peritonitis were made which was similar to Ugochukwu AI.⁶ On exploration of abdomen large amount of purulent fluid was aspirated from the abdominal

cavity, whereas only two patient had minimal purulent fluid, which was in contrast to the study conducted by Ansari AG, noted more than half of patient with minimal peritoneal contamination.⁸ Single perforation at terminal ileum was common also noted in other studies.^{6,15} However, Bhamre S, noted that around half of the patients had two and more perforations.¹ Whereas, the median distance of perforation from ileocecal junction of our study was slightly higher from the study conducted by Sheshe AA. Surgery remains the back bone of treatment in typhoid ileal perforation. However, small intestine in typhoid perforation is edematous, when making an anastomosis or repair sutures get cut through. So, it is better not to do it, moreover other risk factors are common in these patients like late presentation of generalized peritonitis leading to dehydrated and in electrolyte imbalance, sepsis and multi organ failure.¹⁶ In our study the most common procedure performed was loop ileostomy with good outcome. Primary closure of perforation with good surgical outcome noted by Bhamre S, Nema AA and Aliyu S.^{1,7,8} Whereas, surgical procedures result of Ugochukwu AI, were nearly the same as our study but with more cases of primary closure as compare to our study.¹¹ However, Chaudhary P, showed that resection and anastomosis was the preferred surgical approached.⁴ A case study of 15 typhoid ileal perforations in which bowel resection and ileotransverse anastomosis was made, eliminates all the disease ileum.¹⁷ Postoperative complications and mortality (death) with some minor difference were similar to other studies.^{1,7} Another study noted near similar post-operative surgical site infection but high mortality¹⁵ Study observed regular follow up in all patient for reversal of stoma group with 2 patients lost to follow up in after reversal group. This is in similarity with the study conducted by Bhamre S.¹

CONCLUSION

Amongst the various surgical options, opted for patients presenting with peritonitis, following typhoid perforation loop ileostomy was observed to have better in relation to patient outcome. However, it appears that delayed presentation of patients suffering from typhoid perforation to

health care facility have a significant effect on surgical outcome. So, principal importance is to be given on early clinical diagnosis of peritonitis and timely surgical intervention.




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2	Syed Ahmad Sultan Ali	Co-author+Data analysis.	
3	Zainab Abdullah Kaludi	Co-author+Data collection.	
4	Foad Ali Moosa	Critical review and finalizing manuscript.	