COMMON CLINICAL OUTCOMES AFTER PRIMARY CLOSURE IN PATIENTS WITH TYPHOID ILEAL PERFORATIONS A DESCRIPTIVE CROSS SECTIONAL STUDY IN SURGICAL DEPARTMENT KHYBER TEACHING HOSPITAL PESHAWAR.

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ABSTRACT

Introduction: Ileal perforation accounts for major cause for obscure peritonitis. This contributes to high morbidity and mortality in developing countries where medical facilities are not readily available. Enteric fever is endemic in the areas where sanitation is poor in developing countries. Its serious complication is bowel perforation with terminal ileum as the commonest perforation site. Tissue damage in Peyer's patches results in ulceration, bleeding, necrosis, and, in extreme cases, full-thickness perforation and is a major cause of perforation peritonitis**.**

Objective: To determine the frequency of common clinical outcomes after primary repair in patients presenting with typhoid ileal perforations**.**

Materias and methods: This study was conducted in the in the Department of Surgery, Khyber Teaching Hospital, Peshawar from April, 2012 to June, 2014. Through a Descriptive Cross Sectional Study Design, a total of 319 patients presenting with ileal perforation due to typhoid fever were included in the study through a consecutive manner and were subjected to primary closure of the defect and followed up to detect common clinical outcome.

Results: The mean age group of our sample was 34.9 + 16.2 years of which 72.1% were male and 27.9% were females. After doing the primary closure, surgical site infection was observed in 38 (11.9%), wound dehiscence was observed in 51 (16%) and post- operative death was observed in 26 (8.2%) of patients.

Conclusion: Typhoid ileal perforation is a common occurrence in our population and primary closure of the defect is most commonly performed surgery for treatment. However, the frequency of adverse clinical outcome is still high and further treatment strategies must be searched to reduce the burden of these complications.

Key Words: Typhoid Fever, Ileal Perforations, surgical site infection, wound dehiscence, mortality

INTRODUCTION

Ileal perforation is a major cause of obscure peritonitis. Ileal perforation is major cause of morbidity and mortality in developing countries[1]. Diffuse peritonitis is surgical emergency.[2] Despite surgical advancements, non-traumatic ileal perforation is associated with high morbidity and mortality like typhoid, tuberculosis and idiopathic[2,3]. Enteric fever is endemic in areas where sanitation is poor. The incidence of typhoid perforation is 2 to 3% in this country [6,7]. Terminal ileum is the common site of typhoid perforation [4, 6, 7]. Typhoid fever is severe febrile illness caused by gram negative bacillus salmonella enterides.Serovar typhi.[8]Terminal ileum contains payer patches which lead to ulceration leading to necrosis and later on to full thickness perforation[8,9,10,11]. The perforation of ileum in typhoid fever occurs in first two weeks[8, 9].

Primary closure is the preferred treatment. Mortality from typhoid perforation is still high in developing world while it has dropped to 0 to 2 % in the developed world[12].In primary closure the mortality rate is 11.9% with a mean duration of 9 days10. Mortality is due to toxemia, septic shock and multi organ failure[13].

In some studies the mortality observed was 4 to 6% and wound dehiscence 12.7% and wound infection 11.3%. Keeping in view the existing controversies in the literature regarding the clinical outcome of typhoid ileal perforation the rationale of my study is to determine common clinical outcome of patients undergoing primary repair for enteric perforation. The idea behind this study is to generate local statistics.

The result of this study will be shared with the local surgeons to develop our recommendations locally for the better management of ileal perforation.

METHODOLOGY

Study Design: Descriptive Cross Sectional.

Study Settings: Surgical Department, Khyber Teaching

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Duration of study: From April, 2012 to June 2014.

Sample size: Sample size was 319 keeping patients, 4.6%s mortality after primary closure for typhoid ileal perforations, 95% confidence interval and 2.3% margin of error using WHO sample size calculations.

Sampling technique: Consecutive (non probability) sampling.

SAMPLE SELECTION

Inclusion Criteria: All patients presenting to A&E Department with:

1. Acute abdominal pain and gas shadow under the diaphragm on chest radiograph preceeded by 2 weeks fever and confirmed as typhoid by IgM positive antibodies on Typhidot test.

2. Age: 15 years and above.

3. Sex: both male and female.

Exclusion Criteria: All patients presenting with:

1. Duration of disease: beyond 72 hours of onset of acute abdomen.

2. Gastric, Duodenal, Appendicular or Colonic Perforations.

3. Typhoid perforation presented after 72-hours .

The above mentioned conditions act as confounding factors and if included will introduce Bias in the study results.

DATA COLLECTION PROCEDURE

The study was conducted after approval from the ethical committee was obtained. The patients included in the study were directly admitted from the A&E Department or shifted from Medical units with the diagnosis of typhoid ileal perforation (as per operational definitions above). The diagnosis in all these cases was based on history, clinical examination and routine laboratory investigations including Typhidot IgM (positive). Chest Radiograph will confirm the perforation by showing gas shadow under the diaphragm. The purpose, risks and benefits of the study were explained to all included patients, they were assured that the study is purely conducted for research and data publication and informed written consent were obtained from all included patients.

All these patients were prepared for surgery for 2 to 3 hours after admission. Pre-operative resuscitation included intravenous fluids, intravenous antibiotics and correction of electrolytes derangements etc., as indicated. Adequate urine output, normal serum electrolytes and urea was included as indicators of adequate resuscitation.

All exploratory laparotomies were performed by a midline incision, by a single experienced general surgeon having minimum of 5 years experience. Post-operatively all patients was kept in ward under observation for a minimum of 07 days to detect common clinical outcome in terms of surgical site infection, wound dehiscence or mortality.

All chest radiographs was reported by an expert radiologist with at least 5 years experience. All Culture specimens was reported by an expert microbiologist with at least 5 years experience. All the above information was recorded in a predesigned Proforma including name, age, sex and contact address. Exclusion criteria was followed strictly to control confounders and bias in the study results.

DATA ANALYSIS PROCEDURE

All the data was analyzed in SPSS 10.0. Mean + standard deviations was calculated for continuous data like age. Frequencies and percentages was calculated for categorical data like gender and common clinical outcome (wound dehiscence, surgical site infection, mortality). Common clinical outcome was stratified among the age and gender to see the effect modifiers. All the results was presented as tables and charts.

RESULTS

The study was conducted on 319 patients presenting with typhoid ileal perforations and subjected to primary closure of the defect.

The mean age of our sample was 34.9 years with a standard deviation of 16.2 years. We divided the patients in 5 different age groups and we found that in the age group up to 25.00 years we had 39.5%, in the age group 25.01 to 35.00 years we had 16% and in the group 35.01 to 45.00 years we had 20.1%, in the age group 45.01 to 55.00 years we had 8.2% and in the age group beyond 55.01 years we had 16.3% patients. (Table 1).

Out of 319 patients, there were 72.1% males and

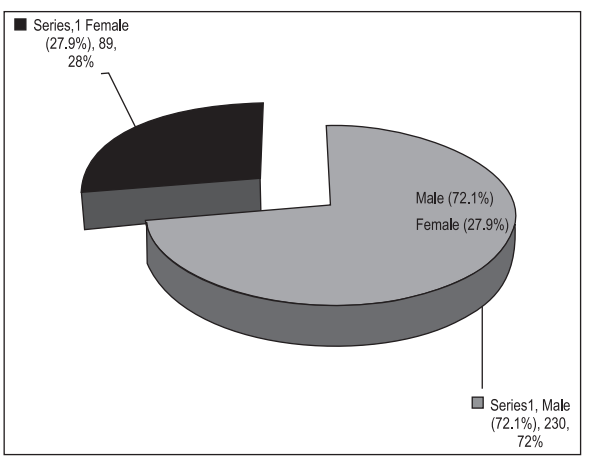

Figure No 1: Gender Wise Distribution of Sample (N=319)

Table 1: Age-Wise Distribution of Sample (N=319)

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Age of Patient	319	48.00	17.50	65.50	34.9361	16.21660

Age Groups

	Frequency	Percent
Upto 25.00 years	126	39.5
25.01 to 35.00 years	51	16.0
35.01 to 45.00 years	64	20.1
45.01 to 55.00 years	26	8.2
55.01 years and above	52	16.3
Total	319	100.0

Table 2: Adverse Clinical Outcome after Primary Closure of Perforation (n = 319)

		Frequency	Percent
	Yes	115	36.1
Valid	No	204	63.9
	Total	319	100.0

Table 3: Type of Adverse Clinical outcome after Primary Closure for Typhoid Perforation (n = 319)

	Frequency	Percent
Nil	204	63.9
Surgical Site Infection	38	11.9
Wound Dehiscence	51	16.0
Mortality	26	8.2
Total	319	100.0

Table 4: Age Wise Stratification of Adverse Clinical outcome after Primary Closure (n = 319)

Age Groups	Adverse Clinical Outcome		Total
	Yes	No	
Upto 25.00 years	24	102	126
25.01 to 35.00 years	26	25	51
35.01 to 45.00 years	39	25	64
45.01 to 55.00 years	13	13	26
55.01 years and above	13	39	52
Total	115	204	319
Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	42.874[a]	4	.000
Likelihood Ratio	43.519	4	.000
Linear-by-Linear Association	4.658	1	.031
N of Valid Cases	319		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.37.

Table 5: Gender Wise Stratification of Adverse Clinical outcome after Primary Closure (n = 319)

		Adverse Clinical Outcome		Total
		Yes	No	
	Male	90	140	230
Gender of Patient				
	Female	25	64	89
Total		115	204	319

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.393	1	.065	.070	.042
Continuity Correctionb	2.931	1	.087		
Likelihood Ratio	3.477	1	.062		
Fisher's Exact Test					
Linear-by-Linear Association	3.382	1	.066		
N of Valid Cases	319				

Table 6: Age Wise Stratification of Type of Adverse Clinical Outcome After Primary Closure: (n = 319)

	Type of Clinical Outcome				Total
	Nil	Surgical Site Infection	Wound Dehiscence	Mortality	
Upto 25.00 years	102	12	12	0	126
25.01 to 35.00 years	25	0	26	0	51
Age Groups 35.01 to 45.00 years	25	26	13	0	64
45.01 to 55.00 years	13	0	0	13	26
55.01 years and above	39	0	0	13	52
Total	204	38	51	26	319

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	224.918	12	.000
Likelihood Ratio	205.011	12	.000
Linear-by-Linear Association	17.305	1	.000
N of Valid Cases	319		

27.9% females (Figure 1)

All the patients were subjected to standard pre operative preparations and subjected to exploratory laparotomy for primary closure of the ileal defect. On follow up adverse clinical outcome was observed in 115 (36.1%) of patients (Table 2)

On identifying different types of adverse clinical outcome, the surgical site infection was observed in 38 (11.9%), wound dehiscence was observed in 51 (16%) and post operative death was observed in 26 (8.2%) of patients. (Table 3)

We stratified the adverse clinical outcome with regards to different age groups. We observed that occurrence of adverse clinical events after primary closure for typhoid ileal perforation was more often seen as the age advances and less observed in age group below 25.00 years. The difference was statistically significant after applying chi square test with a p value of 0.00 (Table 4)

However, on stratifying the occurrence of adverse clinical outcome after primary closure for typhoid ileal perforations, we could observe a statistically significant difference with regards to gender as after applying chi square test the obtained p value was 0.65. (Table 5)

Table 7: Gender Wise Stratification of Typeo Adverse Clinical Outcome After Primary Closure (n = 319)

	Type of Clinical Outcome				Total
	Nil	Surgical Site Infection	Wound Dehis-cence	Mortality	
Gender of Male	140	38	39	13	230
Patient Female	64	0	12	13	89
Total	204	38	51	26	319

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.725	3	.000
Likelihood Ratio	32.208	3	.000
Linear-by-Linear Association	.072	1	.789
N of Valid Cases	319		

We stratified the individual adverse clinical outcome with regards to different age groups. We observed that surgical site infection was more often seen in age groups below 25.00 years and in the age group between 35.00 to 45.01 years, wound dehiscence was seen in all age groups below 45.00 years while mortality was more often seen in age groups above 45.01 years. On applying chi square test, the difference was statistically significant with a p value of 0.00 (Table 6)

While stratifying the different adverse clinical outcome with regards to gender, we observed that most of the adverse outcome were often seen among males as compared to females. After applying chi square test, the difference was statistically significant with a p value of 0.00 (Table 7)

DISCUSSION

Ileal perforation accounts for the major cause of obscure peritonitis. This contributes to high mortality and morbidity in the developing countries. Where medical facilities are not readily available[14,15].

The features mimic to acute abdomen pain, febrile illness such as appendicular pathologies,diffuse peritonitis due to ileal perforation is urgent surgery as is associated with high mortality and morbidity[2,3].

Delay in surgical intervention is due to rural areas where medical facilities are scarce[16,17].

Surgical options such as simple/primary closure,resection and end to end anastomsis,ileo transverse anastomosis and primary closure is commonly performed.

Various functions play a vital role in mortality and morbidity in determining the outcome measures in non traumatic ileal perforations such as delay in peritonitis ,anemia, hypovolemic shock, septicemic shock, fecal contamination of peritoneum[18,19].

The inturn in typhoid perforation is justified by its high mortality and prevalence in children and young people.

The mortality rate of typhoid intestinal perforations are reported to be between 5 % to 62% but reach 80% to receive late surgical treatment. The mortality is related to diffuse peritonitis, delayed treatment, malnutrition, inadequate antibiotic therapy and lack of therapeutic resources [26,27].

The choice of surgical treatment for ileal perforation is controversial.The choice of surgical treatment recommended in the literature include primary repair,simple excision of edges of perforation and closure,wedge resection and closure,segmental resection and end to end anastomsis, right hemicolectomy with ileo- colic and ileo- transverse anastomsis[24].

Atamanalp and Rehman found no correlation between surgical procedure and mortality [28], while some others found low mortality rates in resection,end to end anastomsis than primary repair[29]. Beniwal suggested primary repair as first choice[29].

The mean age in our study was higher then other studies[30]. As the patient below 50 years were excluded from our study. The incidence of typhoid fever is highest in children [21,30,31]. In our study the incidence was highest in mean age group from 15 to 35 years which is similar to other studies[14,16,30].

The peritoneal fluid content and delay in surgical time increases the severity of contamination and friability of bowel in literature it is advocated to resect 60cm,s of terminal ileum but in our study primary repair was performed and though morbidity and mortality remained high[17,18].

In our study primary closure of perforation was the commonly used technique (segmental resection and end to end anastomosis). The high incidence of dehiscence in our experience differs from the reported

in literature where it seems to be less than 10%[23,32].

Mortality as we have mentioned before was comparatively low for our patients. However, more than half of the patients who died after initial laparotomy was due to poor conditions of the patients.

Although we didn't consider the number of perforations in our study but literature is controversial with not necessarily high mortality with multiple perforation[23,24,29]. We didn't however observe high mortality for male patients although this is reported by others.

CONCLUSION

Adverse clinical outcome are not uncommon after primary closure for typhoid ileal perforations. More research is required to generate recommendations for the therapy to reduce the burden of these worse clinical outcome specially wound dehiscence and death after surgery.

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