Typhoid Ileal Perforation and Its Prognostic Factors

Masood Ahmed[1], Muhammad Abid Owais[2], Abdul Rehman[3], Mushtaque Ahmed Abbasi[4], Syed Moin Islam Shah[5], Imtiaz Ali Langah[6]

[1]Masood Ahmed, Associate Professor of Surgery, People's University of Medical and Health Sciences Nawabshah Pakistan
Email: drmasood2001@hotmail.com

[2]Muhammad Abid Owais, Associate Professor of Surgery, Baqai Medical University Karachi Pakistan
Email: abidowais74@gmail.com

[3]Abdul Rehman, Assistant Professor of Anatomy, Bhitai Dental and Medical College Mirpurkhas Pakistan
Email: drabdulrehman2008@gmail.com

[4]Mushtaque Ahmed Abbasi, Associate Professor of Surgery, People's University of Medical and Health Sciences Nawabshah Pakistan
Email: mushtaqueabbasi11@gmail.com

[5]Syed Moin Islam Shah, Assistant Professor of Surgery, Sulaman Roshan Medical College Tandoadam Pakistan
Email: drmoinshah67@gmail.com

[6]Imtiaz Ali Langah, Assistant Professor of Surgery, People's University of Medical and Health Sciences Nawabshah Pakistan
Email: langahimtiaznova@gmail.com

Abstract

Background: Typhoid enteritis is a dangerous disease which has certain complications. One of its complications is typhoid ileal perforation which is very serious and is associated with a high rate of mortality and morbidity in a number of tropical countries. **Objective:** The purpose to conduct this study was to study typhoid ileal perforation and the prognostic factors that are associated with it. **Study design:** A cross-sectional study **Place and Duration: This study was conducted at** People's University of Medical and Health Sciences Nawabshah **from October 2021 to October 2022 Methodology:** Overall, 40 patients were included in this research. All of the patients had typhoid perforation. All of the participants were treated surgically at the surgical unit of our department. The clinical diagnosis includes an edematous and acutely inflamed terminal ileum, intraoperative results of ileal perforation, and a positive Widal test which was completed by the radiological outcomes of pneumoperitoneum. After adequate resuscitation, every participant went under exploratory laparotomy through lower-midline incisions. **Results:** A total of 19 males, representing 47.5% of the participants, and 21 females, representing 52.5% of the participants, were included in this research. All of the patients' age was falling in the range of 2 years to 55 years. The average age calculated was 13.5 years. The rate of morbidity was found to be 49.1 percent. The most common complications recorded after the surgery were burst abdomen, wound infection, residual intra-abdominal abscesses, wound dehiscence, and enterocutaneous fistula. The rate of mortality was found to be 15 percent. Severe peritoneal contamination, multiple perforations, and burst abdomen affected the mortality rate significantly. The average hospital stay was 16 days. The range of days for stay was from 8 days to 57 days. **Conclusion:** In this research, typhoid ileal perforation was described and the prognostic factors associated with it, which would have an influence on the mortality.

Introduction

All around the world, in underdeveloped and poor countries, typhoid fever is very common and it regularly occurs in those countries. Due to this, a number of fatal complications arise such as intestinal perforation. Certain challenges such as septicemia, generalizing peritonitis, and fluid and electrolyte derangements are led by intestinal perforation. It is known that surgical acute abdomen is commonly caused by typhoid intestinal perforation [2]. Worldwide, the occurrence of perforation rates differs a lot. The highest perforation rates are found in the sub-region of West Africa, which is the highest in the world. It is about 15% to 33%. The reason for this much higher rate is still unknown [3, 5].

In a number of countries, intestinal perforation is common and remains a severe complication and problem of typhoid perforation. It is linked with high morbidity and mortality because of not having enough medical facilities, not having enough clean water to drink, poor sanitation in remote areas and a

doi.org/10.31838/hiv23.03.73 Received: 13.10.22, Revised: 15.11.22, Accepted: 08.12.22.

prolonged stay in the hospital. The range of the rates of perforation is from 0.8 percent to 18 percent [3]. The occurrence of perforation is high in a majority of the countries that are developing because the disease is diagnosed late, due to the occurrence of virulent strains and multidrug resistance. Typhoid perforation is seen in most people who are in the first and second decades of their lives. They are mostly young adults and children. It is common in those areas which have low socioeconomic strata.

Although great improvement has been made in health care over the years, some factors still let the rate of mortality and morbidity high of typhoid perforation [4, 8]. This research was conducted to study typhoid ileal perforation and the prognostic factors that are associated with it and make a comparison of the results of our research with other related studies of the world. Helping in improving the quality of health care, prioritizing management, and decision-making will be provided by the outcome factors which will be identified in this research.

Methodology

Overall, forty participants were selected for this research. All of the patients had typhoid perforation. All of the participants were treated surgically at the surgical unit of our department. Clinical diagnosis was carried forward. The clinical diagnosis includes an edematous and acutely inflamed terminal ileum, intraoperative results of ileal perforation, and a positive Widal test which was completed by the radiological outcomes of pneumoperitoneum.

All participants had several complications, before the surgery, that were managed withintravenous fluids and electrolytes, metronidazole and chloramphenicol, broad-spectrum antibiotic coverage, urethral catheterization, and nasogastric suction. The patients who had typhoid perforation needed blood transfusions. In order to detect air under the diaphragm, some investigations were carried out before the surgery which included urea and electrolytes, packed cell volume, and abdominal and chest radiographs.

After the adequate resuscitation, every participant went under exploratory laparotomy through lower-midline incisions. After the operation, the readings were noted to determine the drainage of fecal material and the amount of pus. Silk 2/0 and chromic catgut 2/0 was used to perform double-layer closure and ileal perforation was also performed. For a few participants, right hemicolectomy with ileo-transverse anastomosis, and ileal resection and anastomosis were performed. Warm saline was used to do copious peritoneal lavage by draining the pelvis. Nylon-1 was used to perform the mass closure of the abdomen. Nylon-2/0 was used to close the skin through interrupted stitches. All of the outcomes after the surgery were recorded and monitored. All of the participants went through a proforma which was developed for the research.

The fifth version of Epi Information software was used to analyze the data [5]. In order to discover the effect of the variables in the research on the outcome factors, multivariate analysis was performed. A p-value below 0.05 was considered significant.

Results

A total of 19 males, representing 47.5% of the participants, and 21 females, representing 52.5% of the participants, were included in this research. All of the patients' age was falling in the range of 2 years to 55 years. The average age calculated was 13.5 years. Overall 33 patients out of 40 were young adults and children, representing 82.5 percent of the participants. The participants who survived had an average age of 12.3 years. Those who did not survive had an average age of 11.6 years. The difference between both groups was more than 0.05 which is not statistically significant. A total of 6 participants died which shows 15 percent of the total participants. Table number 1 shows the prognostic factors that were identified in this research.

The average symptom duration was 12.5 days. The range for the duration of symptoms was from 1 day to 30 days. There were 19 patients who showed symptoms within 14 days of illness and the percentage of mortality was 10.5 percent. There were 21 patients who showed symptoms after 14 days of illness and the percentage of mortality was 19 percent. This shows that it was not significant because the p-value was greater than 0.05. There were 9 participants who had the surgery within 24 hours and there were no deaths recorded. On the other hand, 31 patients had the surgery after 24 hours which showed the rate of mortality as 19.35%. Here also the p-value calculated was greater than 0.05 which was not significant.

There were 28 patients who had single perforations and the rate of mortality was 10.7 percent, showing that 3 people died with single perforation. There were 12 patients who had multiple perforations and the rate of mortality was 25%, showing that 3 people died with multiple perforations. The average quantity of the peritoneal fluid was 718 ml and the range was from 100 ml to 1600 ml. There were 30 patients who had peritoneal fluid of fewer than 1000 ml and three people died. On the other hand, there were 10 patients who had peritoneal fluid of more than 1000 ml and here also three people died which showed a significant impact on mortality.

There were 29 participants who had simple closure of the perforations out of which 5 people died, representing 17.2 percent of mortality. There were 11 patients who had ileal resection out of which only 1 patient died, representing 9 percent of mortality. There was no significant difference seen here. There were two patients who developed fecal fistula out of which 1 patient died. There were 6 participants who developed burst abdomen out of which 4 people died, showing a significant impact on mortality. Lastly, there were two patients who had septicemia and both of them died. Table number 2 shows the distribution of patients by their demographics. Table

number 3 shows the complications recorded after the surgery.

Table No. 1: prognostic factors of the study participants		
Variable	Mortality	p-value
Gender		<0.05
Male	1/19	
Female	5/21	
No. of perforations		<0.05
Single	3/28	
Multiple	3/12	
Symptoms' duration		>0.05
Within 14 days	2/19	
After 14 days	4/21	
Operation type		>0.05
Simple Closure	5/29	
Ileal resection	1/11	
Operation time		>0.05
Less than 24hrs	0/9	
More than 24hrs	6/31	
Peritoneal fluid		<0.05
Less than 1000ml	3/30	
More than 1000ml	3/10	
Fecal fistula	1/2	>0.05
Burst abdomen	4/6	<0.05
Septicemia	2/2	<0.05

Table No. 2:Distribution of patients by their demographics		
Age group (Years)	Female	Male
0-15	4	3
16-30	13	9
31-45	3	5
45-55	1	2
Total	21	19

Table number 3: The complications recorded after the surgery.	
Complications	Frequency
Wound Infection	23
Burst abdomen	7
Intra-abdominal abscesses	4
Wound dehiscence	3
Fistula	3

Discussion

In this research, we found out that there are multiple perforations, burst abdomen after the surgery, and peritoneal contamination that significantly influence the mortality in patients with typhoid perforation. The females were in majority in our research but in other studies, there was male dominance [4, 5, 7, 9]. Males have an increased risk of perforation and necrosis. That is why they are more exposed to this infection [9]. It is because of genetic predisposition and immune mechanisms [10]. Typhoid perforation is seen in most people who are in the first and second decades of their lives. They are mostly young adults and children. This age group shows productiveness in comparison to the 3rd and 4th decades shown in a few studies [4, 5, 9].

The range for the rate of mortality was from 9 percent to 43 percent [5]. In our study, the rate of mortality was 15 percent which is almost similar to previous research which had 12.1 percent from Lagos, 28 percent from Nigeria, and 17 percent from Ilelfe [5, 7, 11]. These rates are higher compared to the rates of tropical countries such as India and Nepal. Nepal has a rate of mortality of 6.8 percent and India has a rate of mortality of 10.5% [4, 9]. Nevertheless, the rate of mortality in a number of well-developed countries is seen to be much lower, about 1 to 2% [12].

A number of factors affect the result of typhoid perforation [4, 11, 13]. The age and gender of the patients in our research show no significant impact on mortality. This is also similar to a few prior studies [14, 15]. There were some factors that did not affect the mortality such as fecal fistula, surgical intervention time, and late presentation. However, the mortality is associated with multiple perforations which are also similar to a number of research studies [11]. The profuse peritoneal exudate also affected the rate of mortality which shows the degree of fecal peritoneal contamination and it is similar to a study in Nigeria [5]. The result of fecal peritoneal contamination can be fatal results and overwhelming sepsis. There is also another type of typhoid perforation which is called profuse peritoneal but no attempt is seen at the perforation localization.

According to this research and other research studies, the best chance for a patient to survive is to go under surgical intervention but the type of operation conducted has no relation to mortality and morbidity. The state of the terminal ileum and the number of perforations should be considered while determining the procedure that should be performed to treat perforation [3]. The most common and less time-consuming procedure is

simple closure. A wide number of surgeons use this procedure because it is cost-effective and it shows good results. On the other hand, in multiple perforations, gangrenous bowel, and terminal ileum, intestinal resection with anastomosis is indicated. In order to avoid a fatal outcome, long and time-consuming procedures should not be performed under prolonged anesthesia. According to Santoshi and Eggleston, exteriorization, ileo-transverse colostomy, and ileostomy are some of the surgeries that save the lives of people [18, 19].

The fistula was found to be the outcome after the surgery which would severely affect the mortality but our research shows that it does not have a significant impact on the rate of mortality. By using repair leaks, the outcome of fecal fistula in our research was much lower than the outcome shown in other research studies. Other researchers reported the result of fecal fistula as 8 percent, 7.8 percent, and 16.5 percent [16, 17, 18]. In our study, mortality was significantly affected by burst abdomen as 4 people died out of 6 who had burst abdomen, representing 66.7 percent, which is a very high rate. In our research, wound infection, fecal fistula, and peritoneal contamination were all linked with a burst abdomen.

The patients who survived the surgery developed a number of complications. The complications after the surgery include a burst abdomen, wound infection, residual intra-abdominal abscesses, wound dehiscence, and enterocutaneous fistula. Due to these complications, the cost of management was increased and the hospital stay was also prolonged. In order to reduce the incidence of wound infection through delayed primary closure, there were several attempts made but they have not been successful [20].

Conclusion

In our research, we evaluated that multiple perforations, burst abdomen, and copious peritoneal fluid adversely affects the rate of mortality in typhoid perforation. Most of the people who survived were having wound infections, fecal fistula, and wound dehiscence and had to stay in the hospital for too long.

Funding source

None

Conflict of interest

None

Permission

Permission was taken from the ethical review committee

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