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MORBIDITY & MORTALITY OF TYPHOID PERFORATION OF SMALL BOWEL

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Abstract:

Typhoid fever remains a public health problem in the developing world with gut perforation the major complication. Typhoid ileal perforation, even though is a rare complication of enteric fever is often associated with a significantly high morbidity and mortality.to know the various factors affecting the prognosis of the patient and the morbidity and mortality of typhoid perforation of small bowel in typhoid fever the present study conducted in Krishna hospital and Medical research centre,Karadin the period of 2017 to 2019 over 35 patients. Most of the patients were seen in between second and third decade of life with male preponderance (M 4:1 F). There were 29 single perforations and 6 multiple perforations.26 perforations were located within 30cm of ileo-caecal junction. Fourteen patients were operated within 24hrs of presentation with the morbidity of 50% and no mortality was seen.Twent one patients were operated after 24hrs of their presentation with the morbidity of 76% and mortality of 19%.Patients who presented late had more morbidity and mortality. Patients presented early had low morbidity rates and no mortality seen.

INTRODUCTION

Tyohoid fever remains a public health problem in the developing world with gut perforation the major complication.

Typhoid ileal perforation ,eventhough is a rare complication of enteric fever is often associated with a significantly high morbidity and moetality.Perforation may complicate the course of a patient who appears to be responding to treatment but it more often ensues when the patient is toxic .In such a seriously ill patient the symptoms and signs are often masked by the patient's apathy and dullness.

Typhoid perforation of small bowel was almost invariably fatal ,surgery is the best desinitive treatment of typhoid perforation but the extent of surgery remains controversial.

MATERIALS AND METHODS

Ethical Statement: The Study made the standards outlining the declaration of Helsinki and Good Epidemiological practices. This study did not change or modify the laboratory of clinical practices of each centre and differences of practices were kept as they are.The data collection was anonymous and identifiable patient information was not submitted.

Individual researchers were responsible for complying with local ethical standards and hospital registration of study.

Thirty five consecutive patients clinically diagnosed as having typhoid perforation of small bowel were seen between 2017 to 2019 in Krishna hospital and Medical research centre,Karad. All the age groups from 10 yrs to 55 yrs and both males and females were included in this study.

In making the diagnosis and deciding the criteria for inclusion in the study,great emphasis has been given to clinical symptoms and signs;fever abdominal pain and the signs of abdominal tenderness,guarding, rigidity, distension of abdomen ,absent bowel sounds, free fluid in the abdomen, and obliteration of liver dullness were considered most important.

Preoperative investigations included :

- In all patients **blood urea levels**and **serum electrolyte** levels were estimated.
- **Plain X-ray abdomen** was done to detect air under the diaphragm in all patients.
- **Widal test –** Blood drawn immediately before the surgery or in the immediate post operative period and sent for the Widal test which was done with standard method using antigen strips.

Also diagnosis was further supported by

- **Operative findings** of ileal perforation along the anti mesenteric border.
- An acutely inflamed and edematous terminal ileum
- Mesentric lymphadenopathy with
- Associated peritoneal soilage. These are common operative findings in patients with typhoid perforation.

Patients with peritonitis due to other causes such as perforated appendicitis and duodenal ulcer perforation were excluded from the study.

Preoparative resuscitation included intravenous fluids, commencement of Ceftriaxone,Gentamicin or Amikacin and Metronidazole .Electrolyte derangement was corrected when indicated.

Adequate urine output (should be at least 30-40 ml/hr) normal serum electrolytes and urea were considered a good indication of adequate resuscitation.

Laparotomy was performed in all patients under general anaesthesia within the first 24 hours in 14 patients,21 patients after 24 hours ,[14 patients in between 24-28 hours and 7 patients after 48 hours] the delay being caused by the presentation of patients to the hospital and by the need for adequate resuscitation.

The skin incisions were right paramedian and midline. Operative findings were noted and the amounts of pus and fecal material drained estimated. The edge of the ileal perforation was excised and sent for histo-pathological examination. Various surgical methods used were

- Primary closure in (24 patients)
- Resection and end to end anastomosis (6 patients)

- Exteriorization of closed perforated bowel (2 patients)
- Exteriorization of perforated ileum (1 patients)
- Primary closure with ilea-transverse anastomosis (1 patient)
- Peritoneal drainage followed by simple closure in (1 patient)

The peritoneal cavity was irrigated with copiuous amounts of normal saline. Drains were inserted to drain the right paracolic gutter and the pelvic cavity, these were brought 10 cms from the wounds to drain continuously into empty graduated plastic bags.

The midline incisions were closed by mass closure with prolene or polyamide sutupack; while the right paramedian were closed in layes with chromic catgut to close the peritoneum and posterior rectus sheat, and prolene or sutupack to close the anterior rectus sheath. The skin was closed with thread

Ileal tissue was take from the ileal perforation site during surgery and for histpathological examination in the solution of formalin(fixative), where the tissue processing was done with paraffin. Thin smears were made and stained with Hematoxylin and Eosin and examined under microscope.

Attention was paid to the major complications of wound infection, wound dehiscence, residual intra abdominal abscess, fecal fistula and death.

The course of the morbid conditions was closely observed; and the patients followed up till their death or discharge from hospital.

Statistical analysis: Since there was no comparative group study, results were expressed as ratios and percentages

Observations and Results

AGE AND SEX

GROUP	MALE	FEMALE	TOTAL	%
<10 YEARS	2	-	2	5.72
11-20 YEARS	9	2	-	31.43
21-30 YEARS	10	2	12	34.28
31-40 YEARS	5	2	7	20
>40 YEARS	2	1	3	8.57

Most of yhe patients were seen in between second and third decade of life with male preponderance(M4:1F)

FEVER BEFORE PAIN ABDOMEN

Duration	NO .OF Patients	%	Morbidity Rate	Mortality Rate
<1week	3	8.57	3(100%)	-
1-2 weeks	10	28.57	5(50%)	-
2-3 weeks	13	37.14	8(61.5%)	3(23%)
Same duration of fever &pain abdomen	5	14.28	4(80%)	1(20%)
No fever	4	11.12	3(75%)	-

Most of the patients were seen in between second and third week of illness (65.7%)

SYMPTOMS:

Symptoms	No of patients	Percentage %
Pain abdomen	35	100
Fever	31	88.5
Distention of abdomen	16	45.7
Vomitings	19	54.2
Constipation	08	22.8
Loose motion	03	8.5
Hematemisis	02	5.7
Malena	04	11.4

Abdominal pain and fever were the most common symtoms.

PRESENTATION :

	No.of patients	%	Morbidity rate	Mortality rate
Febrile/ Toxic	23	65.71	14 (60.86)	3(13.04)
Afebrile	12	34.28	9(75)	1(8.3)

23 patients were presented in a toxic state and had more morbidity and mortality

Signs of Perotonitis

Signs of Perotonitis	No.of patients	%	Morbidity rate	Mortality rate
Generalised	25	71.42	16(64)	4(16.6)
Localised	10	28.57	7(70)	-

Patients presented with generalized peritonitis had high mortality rate but morbidity rates were similar in both the groups.

PERFORATION

There were 29 single perforations and 6multiple perforations.26 perforations were locatedwithin 30cm of ileo-caecal junction.

	No.of patients	%	Morbidity rate	Mortality rate
Single perforation	29	82.85	23 (79.31)	3 (10.34)
Multiple perforations	6	17.14	4 (66.66)	1 (16.66)

PERFORATION SITE (SINGLE)-DISTANCE FROM ILEOCAECAL JUNCTION

Site	No of patients	%	Morbidity	Mortality
0 – 15	15	51.72	10(66.66)	2(13.33)
16 – 30	11	37.93	7(63.33)	1(9.09)
31 – 45	-	-	-	-
>45cm	3	10.34	3(100)	-

The closest perforation was 2cm from the ileal junction. The farthest was 60cm from the ileo caecal junction. The closer the site of perforation to the ileocaecal junction had more mortality and morbidity rates.

SIZE OF THE PERFORATION (SINGLE)

Size	No of patients	%	Morbidity	Mortality
<0.5 cm	13	44.82	9(69.23)	1(7.6)
>0.5 cm	16	55.77	12(75.00)	2(12.5)

Size of the perforation varies from 0.2cm to 2.5cm and an average size of 0.6cm. 55% of the perforations were more than 0.5 cm had high morbidity and mortality rates.

PERITONEAL FLUID:

Type	No of patients	%	Morbidity	Mortality
Bilious	7	20	4(57.14)	1(14.28)
Faeculent	13	34.28	8(66.6)	2(16.66)
Purulent	16	45.71	12(75.0)	1(6.25)

Amount of free peritoneal fluid was between 50cc to 3000cc, type of fluid was bilious, feculent or purulent with an average of 1100cc.

AMOUNT OF PERITONEAL FLUID:

Amount	No of patients (%)	Morbidity	Mortality	Faecal a
<1 litre	21(60%)	14(66.66)	1(4.76)	2(9.50)
>1 litre	14(40%)	10(71.42)	3(21.42)	5(35.7)

Patients with more than one litre of peritoneal fluid had more morbidity and mortality.

PERITONTIS – OPERATION TIME INTERVAL

Complication	<24hrs (14 pts)	>24hrs(21pts)	
Wound infection	6	12	18(51.42)
Wound dehiscence	-	4	4(11.42)
Residual abscess	-	3	3(8.57)
Feacal fistula	1	6	7(20.00)
Mortality	-	4	4(11.42)

Fourteen patients were operated within 24hrs of presentation with the morbidity of 50% and no mortality was seen. Twent one patients were operated after 24hrs of their presentation with the morbidity of 76% and mortality of 19%.Patients who presented late had more morbidity and mortality. Patients presented early had low morbidity rates and no mortality seen. Peritonitis-Operation time interval is the single most important prognostic factor as similar to other studies.

MANAGEMENT

Complication	Primary closure2 6 (68.57)	Resection and end to end anastomosi s6(17.14)	Exteriorization of the bowel (closed perforation 2(5.71)	Exteriorization of the perforated ileum 1(2.85)	Ileotranseverse Anastomosis 1(2.85)	Peritoneal drainage followed by simple closure 1(2.85)
Wound infection	13	2	-	1	1	1
Wound dehiscence	2	1	1	-	-	-
Residual intraabdominal abscess	1	2	-	-	-	-
Feacal fistula	2	3	2	-	-	-
Mortality	2	2	-	-	-	-

COMPLICATIONS:

Complication	No of patients	%
Wound infection	18	51.42
Wound dehiscence	4	11.42
Residual intra-abdominal abscess	3	8.57
Faecal fistula	7	20.00
Death	4	11.42

Wound infection, Wound dehiscence and residual intra-abdominal abscess were more with primary closure; whereas faecal fistula and mortality rates were more with resection and end to end anastomosis. Faecal fistula was seen in seven patients, six were presented late>24hrs duration, had multiple perforation and gross contamination of peritoneal cavity. Out of which 3 patients were died and other four patients were treated with conservative treatment.

Four patients died, Out of which three patientshad feacal fistula and two patients had septicemia. Allfour patients died 10 days after surgery.

Other complication:

Complication	No of patients (%)
Pulmonary complication	10 (28.57)
Prolonged ileus	2 (5.71)
Thrombophlebitis	1 (2.85)
Bed sores	2 (5.71)

HISTOPATHOLOGIAL EXAMINATION:

Histopathological examination of li leal tissue from the perforation site showed findings were consistent with typhoid perforation in fifteen patients (42%).

HOSPITAL STAY:

Minimum hospital stay was 7 days without anycomplication and maximum hospital stay was 59 dayswith complication, and an average hospital stay was24.85 days

DISCUSSION

AGE INCIDENCE

A total of 35 patients were included in this study. The youngest patient was 10 years old and the oldest was 55 years. The mean age of patients included in this study was 24.9 years, compared to the study by Adesunkanmi (1997) [10], where the mean age was 19.5 years.

GENDER

The male to female ratio in our study was 4:1; similar to the Adesunkanmi study, with preponderance among males [10].

DURATION OF SYMPTOMS

The duration of symptoms ranged from 1 day to 30 days with a mean of 10.5 days; compared to the study by Adesunkanmi(10) where the duration of symptoms ranged from 4 to 28 days with a mean of 11.3 days. Twenty two patients (62.85 %) presented within 2 weeks of symptoms with a morbidity of 59 % (13 out of 22) and with a mortality of 4.5 % (1 out of 22); while 13 patients (37.14%) presented after 2 weeks of symptoms with a morbidity of 61.5% (8 out of 13) and with a mortality of 23% (3 out of 13) compared to the study by Adesunkanmi(10), where 41 patients (82%) presented within 2 weeks of symptoms with a mortality of 24% (10 out of 41 patients) while 9 patients (18%) presented after 2 weeks of symptoms with a mortality or 44.4%.

Duration of illness	Mortality %	
	Present study	**Adesunkanmi study[10]**
Within 2 weeks	4.5%(1/22pts)	24.0% (l0/41pts)
After 2 weeks	23%(3/13pts)	44.4% (4/9pts)

Fourteen patients were operated within 24 hours, while 21 patients were operated upon after 24 hours. The delay was caused by the late presentation of patient to the hospital and by the need for adequate resuscitation before operation. Thirty three out of 35 patients abdomen was opened by midline incision. 2 patients were opened by right paramedian incision. There were single perforations in 29 patients with a morbidity rates of 79.3% (23 out of 29 patients) and with a mortality rate of 6.89 (2 out of 29 patients) and multiple perforations in 6 patients (17%) with a morbidity rate of 66.6% (4 out of 6 patients) and with a mortality rate of 33.3 (2 out of 6 patients) compared to the study by Adesunkanmi(10) where there were single perforations in 43 patients (86%) with a mortality rate of 16.7% and multiple perforations seen in 7 patients (l4%) with a mortality rate of 100%.

No. of Perforations	Mortality %	
	Present study	**Adesunkanmi study[10]**
Single perforations	6.89 (2/29 patients)	16.7% (7/43 patients)

Multiple perforations	33.3 (2/6 patients)	100% (14/14 patients)

Out of 29 patients with single perforation, 15 perforations (51.72%) were located within 15 cm from ileo-caecal junction and 16 perforations were greater than 0.5 cm in diameter with a morbidity of 75% and with a mortality of 12.5%. The amount of pus/fecal matter drained from the peritoneal cavity reflected the extent of contamination. The drainage was between 50 ml to 3000 ml. In 21 patients (60.0%) with less than 1 litre of peritoneal fluid - morbidity rate of 66.66% and with a mortality rate of 4.76% and with a fecal fistula rate of 9.52%. In 14 patients drained more than 1 litre with morbidity rate of 71.42%, mortality rate of 14.2% and with a faecal fistula rate of 35.4%.More the peritoneal contamination, more the morbidity and mortality rates, similar to the findings of Adesunkanmi [10].

Surgical management consisted of primary simple closure of the perforation (68 %); resection and end to end anastomosis (17.14%) exteriorization of the closed perforated bowel (5.71 %); exteriorisation of the perforated ileum (2.85%), primary closure and ileotransverse anastomosis (2.85%) and peritoneal drainage followed by two layer closure (2.85 %). Wound infection, wound dehiscence and intraabdominal residual abscess rates were more with primary closure; whereas faecal fistula and mortality rates were more with resection and end to end anastomosis. Primary closure of perforation with or without an omental patch has been most successful operation for typhoid perforation of small bowel similar to other studies [10]. The post-operative complications recordedwere, wound infection in 18 patients (51.42%); wound dehiscence in 4 patients (11.42 %); residual intraabdominal abscess in 3 patients (8.57%); faecal fistula in 7 patients (20.0%) and 4 patients died (11.42%) as compared to the study by Adesunkanmi [10] where the complication rates were, wound infection 66%; wound dehiscence 34%; residual intra-abdominal abscess 8%; faecal fistula 8% and mortality rate 28% .

Complications	**Present study %**	**Adesunkanmi % [10]**	**Talwar S study % [11]**
Wound Infection	51.42	**66**	**79.1**
Faecal fistula	20	8	10
Mortality	11.42	28	16.4
Wounddehiscence	11.42	8	-
Residual Intra-abdominal abscess	8.57	8	-

Talwar S from Ajmer [11] India reported the complications from his study were wound infection 79.1 %; faecal fistula 10% and mortality rate 16.4%. Faecal fistula adversely affected the Mortality rate. Mortality was 75% in those with faecal fistula; similar to the study by Adesunkanmi [10] (Nigeria) and Talwar S (Ajmer). Survivors were faced with overwhelming wound infection and a high incidence of wound dehiscence; similar to the study by Adesunkanmi and Talwar S [10]. Overall, of 4 patients (11 .42 %) who suffered mortality; all 4 were died after 10 days (range 11 days-52 days) mean of 24.25 days whereas study by Adesunkanmi [10] 53% died within 5 days of postoperative period and 71 % were died within 10 days. Survivors had hospital stays ranging from 7 days to 59 days with a mean of 24 days; compared to study by Adesunkanmi [10] survivors had hospital stays ranging from 15 to 35 days.

CONCLUSIONS

- Perforation to operation time interval is the single most important prognostic factor, as similar to other studies.
- Patients who presented late to the hospital had developed more morbidity and mortality rates, patients presented early had low morbidity rates, and no mortality was seen in the present study.
- Perforations closer to the ileocaecal junction and perforations of size more than 0.5cm had more morbidity mortality rates.
- Multiple perforations and gross contamination had an adverse effect.
- Early surgical intervention (primary closure) reduced the morbidity and mortality.
- Faecal fistulas have adversely affected the mortality rate.
- Survivors were faced with overwhelming wound infection and wound dehiscence with a longer hospital stay
- Triple antibiotic regime in the postoperative period with ceftriaxone, metronidazole and aminoglycoside (gentamicin or amikacin) had contributory effect on decreased rates of morbidity and mortality.

REFERENCES

1. Kayabali L; A Contemporary evaluation of entericperforations in typhoid fever: I n t.Surg. 1990; 75:96- 100.
2. Gibney EJ; Typhoid perforation: BJS 1985; 76:887-889.
3. Chouhan MK; Typhoid enteric perforation BJS,1982; 69: 173-175.
4. Archampong EQ; Operative typhoid perforation ofthe bowel B M J 1969; 3: 273-276.
5. Van Bastun JP; typhoid perforation - A Review ofthe literature since 1960: Trop.Geogr.Med.1994:46(6): 336-339.
6. Jin Pok Kim; Management of ileal perforation dueto typhoid fever. Ann Surg. 1973; 181(1): 88-9.Akgun Y; Typhoid enteric perforation B J S 1995;82:1512-1515.
7. Charles N.Mock; Improvement in survival fromtyphoid ileal perforation Ann.Surg. March 1992;244-248.
8. Ananth Narayan R, C.K.Jayaram Paniker;Textbook of Microbiology, 5th edition, 267-280.
9. Adesunkanmi ARK; The prognostic factors intyphoid ileal perforation: J.R.Co1.Surg. Edinb. 42,1997:395-399.
10. Taiwar S; Typhoid enteric perforation. AUST. N ZJ Surg.1997; 67(6): 351353.
11. Bailey and love text book of Surgery: 27th edition.
12. Sabistons text book of Surgery: 20th edition.
13. Schwartz text book of Surgery 10th edition