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ORIGINAL RESEARCH

ASSESSMENT OF RISK FACTORS FOR ENTERIC PERFORATION IN CASES OF TYPHOID FEVER PATIENTS OF WEST ZONE OF RAJASTHAN

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ABSTRACT

Background:

The present study was conducted to assess risk factors for enteric perforation in cases of typhoid fever.

Materials & Methods: 58 cases of typhoid fever of both genders were included. Group I had typhoid fever patients having enteric perforation and group II had typhoid fever patients with no enteric perforation. Symptoms, signs and laboratory findings were recorded.

Results: Out of 58 patients, males were 32 and females were 26. Symptoms were diarrhea seen in 65% and 34%, vomiting in 70% and 52%, abdominal pain in 86% and 47%, constipation in 38% and 13% in group I and group II respectively. Signs were high fever (>38.3°C) in 94% and 90%, abdominal distention in 45% and 32%, hepatosplenomegaly in 86% and 36%, abdominal rigidity in 50%, confusion in 52% and rebound tenderness in 100%. Laboratory findings were anemia in 15% and 12%, leukopenia in 54% and 22%, gas under diaphragm was 75%, thrombocytopenia in 65% and 22% and elevated transaminase in 58% and 43% respectively. The difference was significant ($P< 0.05$). Risk factors for enteric perforation was male gender, age >40 years and leukopenia ($P< 0.05$).

Conclusion: Authors found that risk factors for enteric perforation were male gender, age >40 years and leukopenia. Typhoid fever and its complications remain an important cause of morbidity in resource-poor countries.

Key words: Anaemia, typhoid fever, leukopenia

Introduction

Several surgical solutions have been proposed for the treatment of TIP, with a consequent variability of morbidity and mortality. Indeed, explicit surgical guidelines, particularly aimed to resource-poor countries, are lacking.[1] Most reports are retrospective, often including a small number of patients with not rarely incomplete data and poor statistical analysis. Surgical morbidity and mortality are often reported without any risk adjustment based on the severity of the disease, delay of treatment etc.[2]

Risk factors for perforation among patients with typhoid fever have been previously assessed. Despite this high morbidity, relatively little is known about risk factors for enteric perforation in patients with typhoid fever.[3] Previous studies have suggested that male sex and leukocytosis predispose patients to enteric perforation.[4,5] Although the mortality rate consequent to TIP in resource-poor countries is improved in the last decades, it is still fluctuating from 5% to 80%, due to surgical- and not surgical-related constraints. Huge economic costs and long timelines are required to provide a short- to middle-term solution to the lack of safe water and sanitation.[6] Inherent limitations of the currently available diagnostic tools may lead to under-evaluation as well as over-evaluation of the disease, with consequent delayed treatment or inappropriate, excessive antibiotic use, hence increasing the

likelihood of bacterial resistance.[7,8] The present study was conducted to assess risk factors for enteric perforation in cases of typhoid fever.

Materials & Methods

The present study comprised of 58 cases of typhoid fever of both genders. All gave their written consent for the active participation.

Data such as name, age, gender etc. was recorded. The diagnosis of typhoid fever was based on the isolation of S. Typhi using standard methods from blood, urine, bone marrow, or stool. Group I had typhoid fever patients having enteric perforation and group II had typhoid fever patients with no enteric perforation. Symptoms, signs and laboratory findings were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 58		
Gender	**Males**	**Females**
Number	32	26

Table I shows that out of 58 patients, males were 32 and females were 26.

Table II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Symptoms	Diarrhea	65%	34%	0.01
	vomiting	70%	52%	
	Abdominal pain	86%	47%	
	constipation	38%	13%	
Signs	High fever (>38.3°C)	94%	90%	0.04
	Abdominal distention	45%	32%	
	Hepatosplenomegaly	86%	36%	
	Abdominal rigidity	50%	0	
	Confusion	52%	0	
	Rebound tenderness	100%	0	
Laboratory findings	Anemia	15%	12%	0.05
	Leukopenia	54%	22%	
	Gas under diaphragm	75%	0%	
	Thrombocytopenia	65%	22%	
	Elevated transaminase	58%	43%	

Table II, graph I shows that symptoms were diarrhea seen in 65% and 34%, vomiting in 70% and 52%, abdominal pain in 86% and 47%, constipation in 38% and 13% in group I and group II respectively. Signs were high fever (>38.3°C) in 94% and 90%, abdominal distention in 45% and 32%, hepatosplenomegaly in 86% and 36%, abdominal rigidity in 50%, confusion in 52% and rebound tenderness in 100%. Laboratory findings were anemia in 15% and 12%, leukopenia in 54% and 22%, gas under diaphragm was 75%, thrombocytopenia in 65% and 22% and elevated transaminase in 58% and 43% respectively. The difference was significant (P< 0.05).

Table III Univariate analysis of risk factors for enteric perforation

Variables	Group I	Group II	Unadjusted OR	P value
Male gender	82%	52%	1.9	0.05
Age (>40 years)	18%	6%	4.2	0.01
Leukopenia	54%	24%	2.7	0.02
High fever (>38.5°C)	91%	96%	0.8	0.19
Anemia	21%	14%	1.2	0.65
Hepatosplenomegaly	34%	57%	0.62	0.42

Table III shows that risk factors for enteric perforation was male gender, age >40 years and leukopenia (P< 0.05).

Discussion

Typhoid fever is a public health challenge, mostly occurring in impoverished, overcrowded areas of the developing world, with lack of safe drinking and sanitation.[9,10] Although there is some evidence that typhoid fever incidence rates have declined over the past several decades, still the global estimation of typhoid fever episodes in 2010 was of 13.5 million.[11,12] The commonest GI complication is intestinal bleeding, usually not severe and managed conservatively, while typhoid intestinal perforation (TIP) is the most serious one. It has been reported in 0.8% to 39%of patients, with a striking difference between high-income and poor resources countries.[13,14] The present study was conducted to assess risk factors for enteric perforation in cases of typhoid fever.

We found that out of 58 patients, males were 32 and females were 26. Hosoglu et al[15] in their study 41 patients who had surgery because of typhoid enteric perforation were compared with 80 control patients. In univariate analyses, male sex (p = 0.01), age (p = 0.01), leukopenia (p = 0.01), inadequate antimicrobial therapy prior to admission (p = 0.01), and short duration of symptoms (p = 0.01) were significantly associated with perforation. In multivariate analysis, male sex, leukopenia, inadequate treatment prior to admission and short duration of symptoms were significant predictors of perforation. A short duration of symptoms, inadequate antimicrobial therapy, male sex, and leukopenia are independent risk factors for enteric perforation in patients with typhoid fever.

We observed that symptoms were diarrhea seen in 65% and 34%, vomiting in 70% and 52%, abdominal pain in 86% and 47%, constipation in 38% and 13% in group I and group II respectively. Signs were high fever (>38.3°C) in 94% and 90%, abdominal distention in 45% and 32%, hepatosplenomegaly in 86% and 36%, abdominal rigidity in 50%, confusion in 52% and rebound tenderness in 100%. Laboratory findings were anemia in 15% and 12%, leukopenia in 54% and 22%, gas under diaphragm was 75%, thrombocytopenia in 65% and 22% and elevated transaminase in 58% and 43% respectively. Khan et al[16] reported that intestinal perforation occurred significantly more frequently in males than in females.

We found that risk factors for enteric perforation was male gender, age >40 years and leukopenia (P< 0.05). Chalya et al[17] determined the prognostic factors of typhoid intestinal perforation. A total of 104 patients were studied representing 8.7% of typhoid fever cases. Males were affected twice more than the females (2.6:1). Their ages ranged from 8 to 76 years with a median age of 18.5 years. The peak age incidence was in the 11-20 years age group. Fever and abdominal pain were the most common presenting symptoms and majority of the patients (80.8%) perforated between within 14 days of illness. Chest and abdominal radiographs revealed pneumoperitonium in 74.7% of cases. Ultrasound showed free peritoneal collection in 85.7% of cases. Nine (10.2%) patients were HIV positive with a median CD4+ count of 261 cells/μl. The perforation-surgery interval was more than 72 hours in 90(86.5%) patients. The majority of patients (84.6%) had single perforations and ileum was the most common part of the bowel affected occurring in 86.2% of cases. Simple closure of the perforations was the most commonly performed procedure accounting for 78.8% of cases. Postoperative complication rate was 39.4% and surgical site infection was the most frequent complication in 55.5% of cases. Mortality rate was 23.1% and it was statistically significantly associated with delayed presentation, inadequate antibiotic treatment prior to admission, shock on admission, HIV positivity, low CD4 count (< 200 cells/μl), high ASA classes (III-V), delayed operation, multiple perforations, severe peritoneal contamination and presence of postoperative complications. The median overall length of hospital stay was 28 days. The limitation the study is small sample size.

Conclusion

Authors found that risk factors for enteric perforation were male gender, age >40 years and leukopenia. Typhoid fever and its complications remain an important cause of morbidity in resource-poor countries.

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