Research Article

INTERNATIONAL RESEARCH JOURNAL OF PHARMACY

www.irjponline.com

ISSN 2230-8407 [LINKING]

EFFECT OF SALMONELLA TYPHI IN ENTERIC PERFORATION

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How to cite: Prasad LK. Effect of salmonella typhi in enteric perforation. International Research Journal of Pharmacy. 2022,13:11:66-67.

Doi: 10.56802/2230-8407.1303216

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Abstract

Background: Typhoid fever is a bacterial infection resulting from the Salmonella enterica serotype Typhi and has a characteristic feature of insidious onset of diarrhoea, constipation, abdominal pain, marked headache, and sustained fever in affected subjects.

Aim: The present study was aimed to assess the risk factors and role of salmonella typhi in enteric perforation.

Methods: The present study assessed 240 subjects from both the gender and in the mean age of 32.2 years that presented to the institute within the defined study period. In included subjects, data was retrospectively assessed concerning the diagnosis of typhoid fever and enteric perforation from the medical records of the Institute. The cases were identified using ICD (International Classification of Diseases) codes designed specifically for typhoid fever.

Results: The study results showed that among 240 subjects assessed, there was an equal distribution of the gender in study subjects with 50.8% (n=122) female and 49.2$ (n=118) male subjects, The duration of the disease before admission at the institute was different with 35$ (n=84) subjects presenting within 7 days of onset of symptoms and 65% (n=156) had longer illness duration and the maximum disease duration was 21 days.

Conclusion: The present study concludes that this study has successfully identified various significant risk factors linked with the development of enteric perforation in subjects that had typhoid fever. These findings focus on the vital role of early diagnosis and prompt management for eliminating the risk associated with severe complications.

Keywords: Enteric fever, enteric perforation, risk factors, salmonella typhi

INTRODUCTION

Typhoid fever is a bacterial infection resulting from Salmonella enterica serotype Typhi and has characteristic of insidious onset of diarrhoea, constipation, abdominal pain, marked headache, and sustained fever in affected subjects. Transmission of salmonella typhi is via contaminated food and water by faeces of infected carriers or persons. Typhoid fever is a significant health care concern across the globe, especially at areas of limited access to sanitation and clean water facilities. Bacterial infection from salmonella typhi is harmful owing to its systemic symptoms as gastrointestinal distress, abdominal pain, and high fever. One of the most severe complications associated with typhoid fever is enteric perforation where there is rupture of intestinal wall which allow escaping of intestinal contents to the abdominal cavity. This event is life-threatening and significantly increase mortality and morbidity rates linked with typhoid fever.[1]

It is vital to understand the risk factors linked with enteric perforation in subjects with typhoid fever which is vital for both public health intervention and clinical management. Despite the fact that typhoid fever can be managed effectively using antibiotics, it is vital to identify the subjects that are at higher risk of enteric perforation that can allow timely intervention including surgical procedures which can prevent the life-threatening results. Enteric perforation concerning typhoid fever is a harmful event usually seen in resource-constrained regions that have limited access to sanitation and healthcare facilities. Typhoid fever has high prevalence in developing nations with poor sanitation practices and contaminated water sources that allow easy transmission of the bacteria. In these areas, burden for enteric perforation is a significant challenge for local communities and healthcare systems.[2]

Enteric fever poses grave consequences in cases of enteric perforation which can lead to multi-organ failure, septicemia, and peritonitis if not managed early and effectively. Also, there is a financial burden for management of enteric perforation which further increase the associated challenges faced by affected subjects and healthcare providers. Intestinal perforation is a serious complication associated with the typhoid fever and us a significant surgical concern in developing nations with it is linked with high morbidity and mortality rates owing to delayed hospitalization, lack of medical facilities, poor sanitization, and lack of clean water for drinking.[3]

The enteric perforation rate has been reported in the range of 0.8% to 18% in the existing literature data. Higher incidence is seen in most of developing nations which are dedicated to late disease diagnosis and emergence of virulent and multi-drug-resistant strains of Salmonella typhi. The disease usually affects the young subjects that have great contribution to the economy of the nations.[4] The present study was aimed to assess the risk factors and role of salmonella typhi in enteric perforation.

MATERIALS AND METHODS

The present retrospective cohort study was aimed to assess the risk factors and role of salmonella typhi in enteric perforation. The study subjects were from Department of Anesthesia of the Institute. Verbal and written informed consent were taken from all the subjects before study participation.

The study included 120 subjects from both the genders that reported to the Institute within the defined study period and had suspicion of enteric fever and were confirmed to have salmonella typhi infection. The inclusion criteria for the study were subjects with diagnosis of typhoid fever irrespective of age that presented with classic clinical pattern and were confirmed on laboratory examination as increased Widal test titers and positive blood culture. The exclusion criteria for the study were subjects that had history of previous abdominal surgeries, contraindications for blood culture, incomplete medical records, and subjects with alternative diagnoses.

For all the included subjects, data were gathered retrospectively by systemically taking the relevant data from the previous existing medical records of the subjects that were diagnosed with typhoid fever. The process involved identification of subjects using ICD (International Classification of Diseases) codes designed specifically for typhoid fever. In all the subjects, demographic data were assessed along with data including physical examination findings, presenting symptoms, and duration of illness before admission.

Laboratory data gathered in study subjects was blood culture reports and titers for Widal test for confirmation of the typhoid fever diagnosis. Also, CT scan data and X-rays were assessed in radiological reports to assess the presence of enteric perforation. Patient comorbidities such as malnutrition were also assessed. The data gathered were collected for statistical analysis for identification of the risk factors linked with enteric perforation in subjects with typhoid fever.

RESULTS

The present retrospective cohort study was aimed to assess the risk factors and role of salmonella typhi in enteric perforation. The present study assessed 240 subjects from both the gender and in the mean age of 32.2 years that were in the age range of 8-70 years that presented to the institute within the defined study period. In included subjects, data was retrospectively assessed concerning the diagnosis of typhoid fever and enteric perforation from the medical records of the Institute. The cases were identified using ICD (International Classification of Diseases) codes designed specifically for typhoid fever. There were 50.8% (n=122) females and 49.2% (n=118) males in the study (Table 1).

It was seen that on assessing the clinical symptoms in study subjects, the most common clinical symptom was diarrhoea seen in 91.66% (n=220) study subjects followed by high fever seen in 90.83% (n=218) subjects, abdominal pain in 90% (n=216) study subjects, and vomiting in 89.16% (n=214) study subjects respectively (Table 1). For duration of illness in the study subjects, the disease duration was <7 days in 84 subjects, was 7-14 days in 76 subjects, and was 15-21 days in 80 study subjects (Table 2).

The study results showed that concerning comorbidities and diagnostic methods in study subjects, the method of diagnosis in most of the study subjects was blood culture as seen in 170 study subjects followed by elevated Widal test titers in 70 study subjects, and radiological including X-ray and CT (computed tomography) in 36 study subjects respectively. Concerning the comorbidities, the most common comorbidity seen was malnutrition seen in 54 study subjects (Table 3).

On assessing the risk factors associated with enteric perforation in subjects with salmonella typhi infection, the most common risk factor was longer duration of illness as seen in 65% (n=156) study subjects followed by malnutrition in 22.5% (n=54) subjects, delayed medical intervention in 15.8% (n=38) subjects, history of gastrointestinal surgery in 10% (n=24) subjects, and least common risk factor seen was age <10 years as seen in 7.5% (n=18) study subjects (Table 4).

DISCUSSION

The present study assessed 240 subjects from both the gender and in the mean age of 32.2 years that were in the age range of 8-70 years that presented to the institute within the defined study period. In included subjects, data was retrospectively assessed concerning the diagnosis of typhoid fever and enteric perforation from the medical records of the Institute. The cases were identified using ICD (International Classification of Diseases) codes designed specifically for typhoid fever. There were 50.8% (n=122) females and 49.2% (n=118) males in the study. These data were comparable to the previous studies of Sarwar Khan J et al[5] in 2002 and Osifo OD et al[6] in 2010 where authors assessed subjects with demographic data comparable to the present study in their respective studies.

The study results showed that on assessing the clinical symptoms in study subjects, the most common clinical symptom was diarrhoea seen in 91.66% (n=220) study subjects followed by high fever seen in 90.83% (n=218) subjects, abdominal pain in 90% (n=216) study subjects, and vomiting in 89.16% (n=214) study subjects respectively. For duration of illness in the study subjects, the disease duration was <7 days in 84 subjects, was 7-14 days in 76 subjects, and was 15-21 days in 80 study subjects. These results were consistent with the findings of Ekenze SO et al[7] in 2008 and Qamar FN et al[8] in 2015 where clinical symptoms and illness duration for typhoid fever reported by the authors in their studies was comparable to the results of the present study.

It was seen that concerning comorbidities and diagnostic methods in study subjects, the method of diagnosis in most of the study subjects was blood culture as seen in 170 study subjects followed by elevated Widal test titers in 70 study subjects, and radiological including X-ray and CT (computed tomography) in 36 study subjects respectively. Concerning the comorbidities, the most common comorbidity seen was malnutrition seen in 54 study subjects. These findings were in agreement with the results of Contini S[9] in 2017 and Singh et al[10] in 2010 where comorbidities and diagnostic methods for typhoid fever assessment adopted in the present study was comparable to the results of the present study.

Concerning the assessment of the risk factors associated with enteric perforation in subjects with salmonella typhi infection, the most common risk factor was longer duration of illness as seen in 65% (n=156) study subjects followed by malnutrition in 22.5% (n=54) subjects, delayed medical intervention in 15.8% (n=38) subjects, history of gastrointestinal surgery in 10% (n=24) subjects, and least common risk factor seen was age <10 years as seen in 7.5% (n=18) study subjects. These results correlated with the findings of Gedik E et al[11] in 2008 and Hosoglu S et al[12] in 2004 where risk factors associated with enteric perforation similar to the present study were also reported by the authors in their studies.

CONCLUSION

Within its limitations, the present study concludes that this study has successfully identified various significant risk factors linked with the development of enteric perforation in subjects that had typhoid fever. These findings focus on the vital role of early diagnosis and prompt management for eliminating the risk associated with severe complications.

REFERENCES

1. Kabwama SN, Bulage L, Nsubuga F, Pande G, Oguttu DW, Mafigiri R, et al. A large and persistent outbreak of typhoid fever caused by consuming contaminated water and streetvended beverages: Kampala, Uganda, January – June 2015. BMC Public Health. 2017;17:23.
2. Lutterloh E, et al. Multidrug-resistant typhoid fever with neurologic findings on the MalawiMozambique border. Clin Infect Dis. 2012;54:1100–6.
3. Ahmed HN, et al. Typhoid perforation still a common problem: situation in Pakistan in comparison to other countries of low human development. JPMA. J Pak Med Assoc. 2006;56:230–2.
4. Edino ST, Yakubu AA, Mohammed AZ, Abubakar IS. Prognostic factors in typhoid ileal perforation: a prospective study of 53 cases. J National Med Assoc 2007;99:1042-45.
5. Sarwar Khan J, Hassan H, Bhopal FG, Mehmood N, Taj N, Alam Khan J, Iqbal M. Typhoid Perforation: A ten-year experience in a Surgical Unit. J Rawal Med Coll. 2002;6:70-73.
6. Osifo OD, Ogiemwonyi SO. Typhoid ileal perforation in children in Benin city. Afr J Paediatr Surg. 2010;7:96-100
7. Ekenze SO, Okoro PE, Amah CC, Ezike HA, Ikefuna AN. Typhoid ileal perforation: analysis of morbidity and mortality in 89 children. Niger J Clin Pract. 2008;11:58-62.
8. Qamar FN, Azmatullah A, Bhutta ZA. Challenges in measuring complications and death due to invasive Salmonella infections. Vaccine. 2015;33:C16-C20.
9. Contini S. Typhoid intestinal perforation in developing countries: Still unavoidable deaths? World J Gastroenterol 2017;23:1925-1931

10. Singh H, Mishra A, Sharma D, Somashekar U. A simple prognostic scoring system for typhoid ileal perforation peritonitis. Trop Doct. 2010;40:203-7.
11. Gedik E, Girgin S, Taçyildiz IH, Akgün Y. Risk factors affecting morbidity in typhoid enteric perforation. Langenbecks Arch Surg. 2008;393:973-7.
12. Hosoglu S, Aldemir M, Akalin S, Geyik MF, Tacyildiz IH, Loeb M. Risk factors for enteric perforation in patients with typhoid Fever. Am J Epidemiol. 2004;160:46-50.

Characteristics	**Number (n=240)**	**Percentage (%)**
Mea age (years)	32.2	
Age range	8-70	
Gender		
Females	122	50.8
Males	118	49.2
Clinical symptoms		
Vomiting	214	89.16
Diarrhoea	220	91.66
Abdominal pain	216	90
High fever	218	90.83

Table 1: Demographic and clinical data in study subjects with salmonella typhi and enteric perforation

Disease duration (days)	**Number (n)**
<7	84
7-14	76
15-21	80

Table 2: Duration of illness in the study subjects

Parameter	**Number (n)**
Method of diagnosis	
Radiological (CT or X-ray)	36
Elevated Widal test titers	70
Blood culture	170
Comorbidity	
Malnutrition	54

Table 3: Comorbidities and diagnostic methods in study subjects

Risk factors	**Number (n=240)**	**Percentage (%)**
Age <10 years	18	7.5
Delayed medical intervention	38	15.8
History of gastrointestinal surgery	24	10
Malnutrition	54	22.5
Longer illness duration	156	65

Table 4: Risk factors associated with enteric perforation in subjects with salmonella typhi infection