



TYPHOID FEVER WITH JAUNDICE; A CLINICAL STUDY IN ABBOTTABAD

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ABSTRACT... Typhoid fever is a systemic infection which is caused by *Salmonella enterica* serotype typhi. It is a multi-system disorder involving many organs including liver. Liver involvement could be in the form of jaundice, rise in liver enzymes or hepatomegaly. It can present as acute hepatitis in rare cases, called typhoid hepatitis. **Objectives:** This study was carried out to study the association of typhoid fever in patients with jaundice. To determine the frequency of typhoid fever among patients presenting with jaundice. **Design:** Descriptive cross sectional study **Setting:** at Gastroenterology Unit, Ayub Teaching Hospital, Abbottabad, **Period:** March 2011 to December 2011. **Methods:** Total 115 patients were included in the study based on inclusion and exclusion criteria. Typhidot IgM test was performed to confirm the diagnosis of typhoid fever. **Results:** The mean age of patients was 28.5 ± 10.14 years, with 54.8% male gender predominating the overall sample. The male to female ratio was 1.2:1. Typhoid fever was found in 22 (19.1%) out of 115 patients with jaundice and there were 68.2% were males and 31.8% were females. **Conclusions:** Typhoid fever is not rare to present as jaundice in our part of the world where typhoid fever is endemic. Therefore, all those patients who have fever, jaundice, abnormal liver function tests or hepatomegaly must be screened for typhoid fever especially in areas where typhoid fever is endemic.

Key words: Jaundice, Typhoid Fever, Salmonella Typhi.

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INTRODUCTION

Enteric fever (which is also called typhoid fever) is a systemic infection which is caused by *Salmonella enterica* serotype typhi^{1,2}. It is an important cause of morbidity and mortality in developing countries because of lack of provision of clean water, poor sanitary conditions and inadequate health care infrastructure^{2,3}. The incidence of typhoid fever varies among different countries and is 29.3, 412.9 and 493.5 cases per 100,000 in China, Pakistan and India respectively⁴.

Typhoid fever is an acute systemic disease and presents with non-specific clinical features e.g. fever, headache, malaise, abdominal pain, relative bradycardia, hepatomegaly and splenomegaly^{2,5-7}. It involves major organs of the body including liver. Liver involvement in typhoid fever can manifest as jaundice, rise in liver enzymes, hepatomegaly or histopathological changes^{2,5-8}. Cases of typhoid fever associated with hepatomegaly, jaundice and deranged liver function tests signifying acute hepatitis, also called typhoid hepatitis, have also

been reported^{7,9-12}. Involvement of liver may be due to generalized toxemia or invasion of liver by the salmonella bacteria⁷. Typhoid hepatitis poses an important diagnostic problem especially in those countries where malaria and acute viral hepatitis are common¹²⁻¹⁴.

The aim of our study was to determine the frequency of typhoid fever among the patients who had jaundice.

MATERIAL & METHODS

This study was done at gastroenterology Unit, Ayub Teaching Hospital, Abbottabad, from March 2011 to December 2011. Non-probabilistic consecutive sampling was done. All patients suffering from jaundice (with yellow discoloration of sclera, having total serum bilirubin level more than 3.0 mg/dl) and more than 10 years of age were included in the study. The patients with positive anti HCV or anti HBsAg antibodies, or those who are taking hepatotoxic drugs i.e. anti-tuberculosis medicine, streptomycin, or patients

suffering from chronic liver disease or haemolytic disorders such as sickle cell disease, glucose-6-phosphate dehydrogenase deficiency, malaria, and all those patients with more than 70 years of age were excluded from the study.

After approval from the Hospital Ethics Committee, all the patients fulfilling the inclusion criteria were enrolled from out-patients department, emergency department and referral from other departments. An informed consent was taken. The diagnosis was made on the basis of detailed clinical history, physical examination and laboratory investigations. All jaundiced patients were investigated for typhoid fever by Typhidot test to detect the IgM antibodies against the Salmonella typhi using enzyme linked immunosorbant assay (ELISA). Blood samples of the patients were acquired in a specialized container using aseptic technique.

The collected data of the study was organised and analysed with the Statistical Package for Social Sciences (SPSS version 17). Frequencies and percentages were computed to present all categorical data including gender, typhoid fever, and continuous data like i.e. age and duration of jaundice were presented by Mean \pm SD.

RESULTS

There were total 115 cases of patients in the study. There were 63 (54.8%) males and 52 (45.2%) females, with a male to female ratio of 1.2:1 as shown in Figure 1.



Figure-1. Gender distribution of study sample

The mean age of the patients in the study group was 28.5 \pm 10.14 years. Majority of patients about 59 (51.3%) were in the age range of 12-22 years,

followed by 33 (28.7%) patients in the age group of 23-32 years, 15 patients (13%) in the age range of 33 to 42 years and 8 (7%) patients were in the age range of 42+ years as shown in Table-I.

Age ranges [in years]	No. Of cases	%age
12-22	59	51.3%
23-32	33	28.7%
33-42	15	13%
42+	8	7%
Total	115	100%

Table-I. Age-wise distribution of sample (n=115)

The study subjects were grouped according to the duration of their jaundice. There were 43 cases (37.4%) of having jaundice for more than >1-7 days, followed by 52 cases (45.2%) with >7-14 days and 20 (17.4%) cases with jaundice of more than 14 days duration as shown in Table-II.

Duration of Jaundice	No. of cases	%age
1-7	43	37.4%
>7-14	52	45.2%
>14	20	17.4%
Total	115	100

Table-II. Distribution of sample according to the duration of jaundice, (n=115)

Out of 115 cases, IgM antibodies for typhoid fever were positive in 22 (19.1%) patients. There were 15 (68.2%) males and 7 (31.8%) females, showing high predilection for male gender. While stratifying the typhoid positive patients according to gender, out of 63 males, 15 (23.8%) had typhoid fever while out of 52 females, 7 (13.5%) had typhoid fever as shown in Table III & IV.

Test	No of Patients	%age
Typhidot IgM Positive	22	19.1%
Typhidot IgM Negative	93	80.9%
Total	115	100%

Table-III. Typhoid positive patients (n=115)

Gender	No of Patients	Typhoid Positive	%age
Male	63	15	13.5%
Female	52	7	23.8%
Total	115	22	19.1%

Table-IV. Gender wise stratification of typhoid positive (n=22)

It was observed that older patients are more likely to present with jaundice while the frequency of typhoid fever among elderly jaundiced individuals was high. Out of 59 patients in the age range 12-22 years, 10 (16.9%) had typhoid fever, out of 33 patients in the age group 23-32 years, 5 (15.15%) had typhoid fever, out of 15 patients in the age range 33-42 years, 4 (26.7%) had typhoid and out of 8 patients in the age range > 42 years, 3 (37.5%) had typhoid fever as shown in Table V.

Age ranges [in years]	No. of Patients	Typhoid Positive	%age
12-22	59	10	16.9%
23-32	33	5	15.15%
33-42	15	4	26.7%
> 42	8	3	37.5%
TOTAL	115	22	-

Table-V. Age-wise stratification of typhoid positive patients (n=22)

While considering the duration of jaundice, out of 43 patients with jaundice of 1-7 days, 9 (20.9%) had typhoid fever, out of 52 patients with jaundice of > 7-14 days, 11 (21.15%) had typhoid fever while out of 20 patients with jaundice of more than 14 days, only 2 (10%) had typhoid fever as shown in Table VI.

Duration of Jaundice	Total Patients	Typhoid Positive	%age
1-7	43	9	20.9%
>7-14	52	11	21.15%
>14	20	2	10%
Total	115	22	

Table-VI. Duration of jaundice wise stratification of typhoid positive patients, (n=22)

DISCUSSION

Typhoid fever is a multi-system systemic disease. It affects major systems of the body and one of them is liver. Hepatic abnormalities range from jaundice, hepatomegaly and deranged liver function tests to development of acute hepatitis, though it's rare^{2,3,9-11,14}. Recognition of liver involvement in typhoid fever is important as it is associated with high relapse rates as well as institution of early

treatment improves prognosis^{5,13}. Therefore, this study was carried out to analyse the prevalence of typhoid fever among jaundiced patients.

Our study has shown male predominance with 63 (54.8%) males and 52 (45.2%) females, with a male to female ratio of 1.2:1. This finding was similar to what Rasoolinejad et al and Ahmed and Ahmed have reported in their studies. In both studies, male patients predominated the study sample where the ratio of male patients was 71.1% and 61.29% respectively^{5,12}.

In our study, 59 (51.3%) patients were between the age of 12-22 years, followed by 33 (28.7%) in the age group of 23-32 years. Durrani Ab has also reported the same in his study where more than 50% of the patients were less than 35 years of age¹⁵. The mean age of the patients in our study was 28.5 ± 10.14 years. Khosla SN and Rasoolinejad et al have reported the similar mean age of their patients which was 26.2 and 25.5 years respectively^{7,12}.

There were 19.1% of cases of jaundice who had typhoid fever in our study. Rasoolinejad et al have reported the incidence of jaundice in typhoid patients to be 24.2% while Ahmed and Ahmed reported it to be 12.2%^{5,12}. This wide variation of the incidence of jaundice in typhoid patients may be due to various factors .e.g. patients presenting late in the hospital, over the counter treatment as it manifests non-specifically initially and lack of healthcare facilities^{2,3,5}. An important contributor to this is delayed or missed diagnosis of typhoid fever. In tropical and developing countries, many diseases present with jaundice like malaria and viral hepatitis^{5,7,16}. This can mislead a clinician in making a correct diagnosis. This can be fatal as typhoid fever is a treatable condition unlike viral hepatitis which has no specific treatment⁵. Therefore, making a correct diagnosis of typhoid fever is very important.

As hepatic dysfunction with jaundice is a serious development in typhoid fever and typhoid fever is endemic in our country, so any patient presenting with fever, jaundice, hepatomegaly and deranged

liver function, the patient should be carefully worked out for typhoid fever while making a diagnosis and other diseases who present in similar manner should be ruled out because early initiation of therapy is associated with much better outcome and prognosis in typhoid fever because it is a treatable disease.

CONCLUSIONS

Liver can be involved in typhoid fever, though rarely. It can present in many different ways including jaundice. Therefore, it is of utmost importance not only to diagnose typhoid induced hepatic abnormalities early so that it can be treated promptly but also to differentiate it from other causes which can affect liver in similar manner. There is still a need of further studies to understand the causative mechanism of liver dysfunction in typhoid fever.

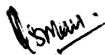
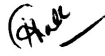
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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Muhammad Usman Anjum	Written manuscript and performed study	
2	Dr. Hafizullah Khan	Prfeormed study	
3	Dr. Syed Humayun Shah	Conceived the idea, supervised and proof-read the manuscript	