

An assessment of liver function test in typhoid fever in children

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Abstract

Background: Liver involvement is known in typhoid and may be in the form of hepatomegaly, jaundice, biochemical and histopathological changes. Isolated hepatomegaly is of no clinical significance, but its occurrence with jaundice though rare indicates liver involvement as a result of generalized toxemia or invasion by salmonella. Significant liver damage may have occurred without obvious clinical signs or abnormal laboratory tests. **Aim of study:** Assessment of liver function in typhoid fever in children diagnosed by widal agglutination test by biochemical test. **Setting:** Fifty-four cases of typhoid fever less than 16 years admitted in Paediatric Department MY Hospital, MGM Medical College Indore, comprised the clinical material for the study. **Design:** Cross sectional study. **Method:** 54 children with enteric fever were taken after making clinical diagnosis, confirmed by Widal test and LFT was performed to assess liver involvement. **Result:** Hepatomegaly was seen in 19 [35%] cases and tender hepatomegaly was seen in 2 cases of the study group. S.G.O.T was raised in 27 [50%] cases and S.G.P.T was raised in 25 [46%] cases out of total 54 cases. Most of the cases with raised S.G.O.T and S.G.P.T presented in the 2nd week of fever. Serum bilirubin was raised in only 2 cases. **Statistical Analysis:** for statistical analysis Kruskal Wallis test was applied. **Conclusion:** Out of 54 cases S.G.O.T was raised in 27 cases and S.G.P.T in 25 cases. Most cases with raised S.G.O.T and S.G.P.T presented in the 2nd week of fever. Serum bilirubin was raised in only 2 cases.

Key words: Typhoid, Salmonella, Serum glutamic oxaloacetic transaminase, Serum glutamic pyruvic transaminase, liver function test.

Introduction

Typhoid fever is a common bacterial infection in the tropics attended with considerable morbidity and mortality.

Hepatic manifestations are not uncommon in enteric fever, this condition was previously called as "hepatitis typhosa" and now termed as typhoid hepatitis, first described by Osler [1].

The incidence of hepatitis in enteric fever was reported more during second to fourth week of illness [2]. Liver involvement may be in the form of hepatomegaly, jaundice, biochemical alterations and histopathological changes. Isolated hepatomegaly is of no clinical

significance, but its occurrence with jaundice though rare indicates liver involvement as a result of generalized toxemia or invasion by salmonella organism.

Abnormal liver function test suggesting hepatic involvement has been reported as 23 to 60% by various studies [3], [4], [5].

Few studies report incidence of elevated transaminases significantly in all the cases in 2nd and 3rd week of illness [6]. As the liver has a great functional reserve, significant liver damage may have occurred without obvious clinical signs or abnormal laboratory tests. The prospective study was planned to review the spectrum of hepatic involvement and to evaluate the severity and outcome of various hepatic manifestations of typhoid fever in children.

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Methodology

Fifty four cases of typhoid fever in children admitted to the Paediatric Department MY Hospital, MGM Medical College Indore, comprised the clinical material for the study. On admission a detailed history and complete physical examination was carried out in all cases and the findings recorded. Routine investigations carried out included total and differential leucocyte count, haemoglobin estimation, urine analysis and stool examination. A clinical diagnosis of typhoid was made on the basis of history of continuous fever, ill and toxic appearance, coated tongue and in a few cases a palpable spleen. The diagnosis was confirmed by the following investigation:

- Serum widal reaction – the widal reaction was considered as positive when -
 - i. Titre with O antigen was more than 1/80.
 - ii. There was a titre of 1/120 or more with B.typhosum H antigen and there was no agglutination with other antigens.
 - iii. A rising titre was seen.
- **Liver function tests :**
 - i. Serum bilirubin – total, direct and indirect.
 - ii . Serum proteins – total, albumin and globulin.
 - iii. Serum glutamic oxaloacetic transaminase [SGOT] and serum glutamic pyruvic transaminase [SGPT] estimation.

Inclusion criteria

1. Age group of 2 years to 14 years
2. Fever of more than 7 days.
3. Enteric fever confirmed by tube agglutination test

Exclusion Criteria

1. Children with other comorbidities like malaria
2. Children with preexistent liver disease.
3. Children with jaundice in last 6 months.

Observation Tables

A prospective study of 54 patients were carried out during the period from Oct. 2012 to May 2013.

Table No 1: Age and sex distribution of the patients.

Age group	Males	Females	Total	Percentage
1-4 years	12	4	16	29.62%
4-8 years	6	16	22	40.74%
8 years and above	2	14	16	29.62%
Total	20	34	54	100%

Majority of the cases 40.74% were in the age group of 4-8 years of age. Out of the 54 cases studied, there were 20 males (37.03%) and 34 female (62.9%).

Table No 2: Showing the incidence of various symptoms in typhoid cases.

Complaints	No. of cases	Percentage
Fever	54	100%
Cough	26	48.14%
Vomiting	28	51.85%
Loose motion	8	14.81%
Abdominal pain	36	66.66%
Loss of appetite	34	62.96%
Abdominal distension	14	25.92%
Swelling all over body	2	7.40%
Jaundice	2	3%

Fever is present in almost all cases. Abdominal pain (66.66%) of cases and Loss of appetite (62.96%) seen in majority of cases.

Table No 3: Showing titers in Widal test.

Titres of	Age Distribution			Total
	(1-4 years)	(4-8 years)	(8 years & above)	
1:80	6	4	4	14
1:160	4	14	4	22
1:320	2	10	6	18

As seen in table, 22 cases had titre of 1:160, in 18 cases titre of 1:320 and in 14 case titre of 1:80 was reported.

Table No 4: Showing SGOT and SGPT value in typhoid cases on admission and on discharge:

	Value	SGOT (units)		SGPT (units)	
		No. of cases	%	No. of cases	%
On admission	> 35	27	50%	29	53.70%
On discharge after 7 days of antibiotic	< 35	20	74.7%	22	75.86%
	> 35	07	25.92%	07	24.14%

On admission, SGOT and SGPT levels were found > 35 IU/L in 27 cases (50%) and 29 cases (53.70%) respectively. On discharge after 7 days of antibiotic, majority of patients had SGOT and SGPT levels < 35 IU/L

Table No 5: Showing the degree and characteristics of hepatomegaly in typhoid cases.

Characteristics	No. of Cases	Percentage
Extent:		
d. Just palpable	7	36.8%
e. Below 2.5 cm.	10	52%
f. Above 2.5 cm.	2	10%
Consistency:		
c. Soft	15	78%
d. Firm	04	21%
Surface:		
Smooth	17	89.4%
Tenderness	02	10.5%

Out of 19 cases of enlarged liver, in 7 cases Liver was just palpable, 10 were below 2.5 cm. and 2 were above 2.5 cm. The surface of liver was smooth in all cases. Tender liver was seen in only 2 cases.

Table No 6: Showing relationship of Hepatomegaly with SGOT & SGPT.

	Total (n=54)		Cases with Hepatomegaly		Cases without Hepatomegaly	
	No of cases	%	No of cases	%	No of cases	%
SGOT (>35U/L)	27	50%	19	70.3%	8	29%
SGPT (>35U/L)	25	46.29%	12	48%	13	52%

Out of 54 cases, 27 patients had raised SGOT and 25 of them had raised SGPT

Discussion

Typhoid fever is a common infection during childhood in our country and has drawn the attention of several workers. The prospective study was carried out in M.Y Hospital, Department of Paediatrics, M.G.M Medical College, Indore [M.P].

A total of 54 admitted Children below 16 years of age with intermittent fever admitted to M.Y H and CNBC and who tested positive for Widal test were taken up for the study.

Typhoid fever has been investigated with regard to its clinical, biochemical and haematological characteristics. Out of the 54 typhoid cases included in this series, there were 20 males (37%) and 34 females (63%).

Majority of children were above 8 years in age, 40.74 percent of our cases had age ranging between 4 and 8 years, 29.62 percents had range of 0 to 4 years and above 8 years.

Fever was present at the time of admission in all cases. Vomiting was present in 51.85 percent of cases. Pain in abdomen, loose motion, abdominal distention were some of the gastro intestinal symptoms. Abdominal pain was seen in 66.66 percent, loose motion was seen in 14.81 percents of cases. 3% percents had jaundice and swelling over body seen in only 7.40 percent.

A similar study by Thome A, Zein E et al [7] including 25 paediatric cases, they observed fever in 97% of cases which was similar but diarrhea was found in greater number of children (36%) as compared to our study. Gastroenteritis was a frequent manifestation in children in 52% in their study.

In our study, Hepatomegaly was seen in 19 [35%] cases. S.G.O.T was raised in 27 [50%] cases and S.G.P.T was raised in 25 [46%] cases out of total 54 cases. Serum bilirubin was raised in only 2 (4%) cases. Similar results with raised SGOT and SGPT was found in other studies, one by Jagadish K et al [8], hepatomegaly was seen in 51.6%, raised levels of SGOT in 61.3% and SGPT in 48.4%.

In another study by Srikanth. N [9], SGOT was found raised in 44% cases and SGPT was raised in 42% cases. Hyperbilirubinemia was seen in 10% patients.

Farzana Shafqat et al [10] found SGOT was raised in 92.1% and SGPT in 68.3% of the subjects while hyperbilirubinemia was seen in 12.4% of the subjects.

Ali Hassan Abro et al [11] studied and found hepatomegaly in 51.9% cases, jaundice in 13.4%, SGPT raised in 85% and SGOT in 75% cases and M Rasoolinejad et al [12] found hepatomegaly in 52.3%, clinical jaundice 1.8%, SGPT 71% & SGOT in 24% of cases. Most of these showed comparable results with SGOT and SGPT raised in majority of cases.

Most of the cases in our study with raised S.G.O.T and S.G.P.T presented in the 2nd week of fever. Similar trend of abnormal LFTs were found by Moegestern R. [6] who studied the causes of liver involvement during the first three week of typhoid fever. In this study hepatomegaly was found during the 2nd or 3rd week more often in the 1st week. Alkaline phosphatase, AST and ALT were raised in 100%, 100% and 91% of cases respectively during the 2nd and 3rd week but during the first week only 11% , 89% and 56% had mild increase [5].

Ozen H, Secmeer Get el [13] observed abnormal liver enzyme level in typhoid fever indicating liver involvement in 50% of the patients.

In another study by M Misadree et al [14] on evaluating the major source of increased serum enzyme level during typhoid fever, showed that hepatomegaly was revealed in 14% of the cases, which was much less than in our study in which hepatomegaly was found in 35% cases. Similarly ALT was elevated in only 22% of cases in their study.

Conclusion

A prospective study of 54 cases was carried out over a period of one year to see the affection of liver functions in typhoid fever among children. Majority of the cases [40.74%] were in the age group of 4-8 years of age. The commonest symptoms encountered in our study were abdominal pain (66.66%), loss of appetite (62.96%) and vomiting (51.85%). Hepatomegaly was noted in 35 % of cases.

S.G.O.T and S.G.P.T were marginally raised on admission in half of cases and most of them were in their second week of illness. S.G.O.T was raised in 27 (50%) cases and S.G.P.T was raised in 25 (46%) cases

out of total 54 cases. Hence signifying affection of liver functions in majority of cases of typhoid fever as shown by many studies before. Most of these changes were partially reversed at the time of discharge.

Raised bilirubin was seen in only 4% of the cases. Thus liver functions can be deranged in many cases in the absence of jaundice.

Here we have recorded liver functions in all diagnosed typhoid patients but further studies are required to know the details effects of liver functions.

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