

Case report

Salmonella Hepatitis in a 10-year Old Boy: A Case Report.

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Abstract

Enteric fever is an acute systemic disease caused by ingestion of food or water contaminated with the organism *Salmonella typhi* or *Salmonella paratyphi*. It can involve virtually any body system and can present with a multitude of presentations. *Salmonella hepatitis* is a recently coined term to describe the hepatic complications of typhoid fever. Acute hepatitis prevalence due to *Salmonella* is 1% to 26% of patients. We report a case of 10-year old boy who presented with fever, jaundice and tender hepatomegaly. His blood culture was positive for *Salmonella typhi* and liver function test shows Acute hepatitis like picture. His ALT/ LDH ratio was 3 (ALT/LDH ratio < 9 is suggestive of *Salmonella hepatitis*). He recovered completely to prompt administration of appropriate antibiotic therapy with supportive management.

Key words: Enteric fever, *Salmonella*, *Salmonella hepatitis*

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Introduction:

Salmonella hepatitis is one of the atypical presentations of typhoid fever and can be defined as reversible involvement of liver during the course of typhoid fever. Hepatic involvement of liver was first reported by William Osler in 1899.¹ *Salmonella hepatitis* is a recently coined term to describe the hepatic complications of typhoid fever. It is a separate entity and has its own clinical presentation and diagnostic tools.² Recognition of *Salmonella hepatitis* is of clinical importance as it can mimic acute viral hepatitis.³ Early institution of specific therapy can improve the prognosis in these patients.

Case Report:

A 10-year old boy from Kamrangirchor presented in our outpatient department with the complaints of anorexia and high-grade fever for 12 days followed by a vague right sided abdominal discomfort, vomiting, loose motion and yellowish discoloration of eyes for 5 days. He had history of high colored urine for the same duration. There was no history of skin rashes, pruritus or any bleeding manifestation. He had no significant history of medical illness, drugs ingestion, surgical procedure or blood transfusion. On examination, he was icteric, febrile & dehydrated. He had tachycardia with normal blood pressure and respiration. Abdominal examination revealed liver was soft, tender, 3cm below the right costal margin at the mid clavicular line. Rest of the general and systemic examination was unremarkable. On

laboratory evaluation his Hemoglobin level was 10.4gm/dl with normal total leucocyte count (8.79×10^9). He had hyponatremia (Na -121.34 mmol /L) & hypokalemia (K-3.12 mmol /L). Liver function test showed acute hepatitis picture (total Bilirubin-34.92umol/L, direct bilirubin-9.18umol/L, ALT-795U/L, PT-16.74sec, INR-1.43) S. LDH- 265.55U/L, ALT/LDH-3. Serological investigations for acute hepatitis were negative for Hepatitis A, B, C, D & E. Blood culture was positive for *Salmonella Typhi*. Radiographic examination of abdomen showed no evidence of perforation, USG abdomen showed mild hepatomegaly & hypo echoic hepatic parenchyma. The diagnosis of *Salmonella Hepatitis* was made on the basis of clinical and laboratory parameters with positive blood culture. Treatment was given with Inj. Ceftriaxone 2gm per day for 10 days. We also corrected dehydration, electrolyte imbalance & coagulopathy. With the above treatment patient improved by decreasing transaminase levels. He was discharged after 12 days of hospitalization.

Discussion:

According to Pakistan Society of Hepatology guideline 2017, a patient is labeled as suffering from *Salmonella Hepatitis* (also called typhoid hepatitis) if he / she fulfills the following 3 of 4 criteria : hepatomegaly, jaundice, biochemical abnormalities i.e. serum bilirubin > 30.6 µmol /l, SGOT/SGPT raised with or without 5' adenosine

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nucleotides and/or prolonged prothrombin time, abnormal liver histopathology.⁴ In this case our patient has following three criteria jaundice, hepatomegaly, biochemical abnormalities & raised ALT/LDH ratio.

Involvement of liver in typhoid is more commonly seen in endemic areas but has also been reported from non-endemic areas. Acute hepatitis prevalence due to Salmonella is 1% to 26% of patients.⁵ In that sense Bangladesh is highly endemic for Typhoid fever.

Exact mechanism of hepatic damage in typhoid fever is not clear. More commonly seen in malnourished people belonging to lower socio-economic group.⁶ Bacteremia may be the cause of liver damage as bacteremia occurs in most patients with typhoid fever. Salmonella endotoxin has been implicated in causing Salmonella hepatitis like other features of typhoid fever. When these bacilli enter the circulation after considerable multiplication in lymphoid tissue of intestine, they undergo destruction with the liberation of endotoxin which produces the symptoms of typhoid fever. That is why in our case the boy presented with high grade fever for 15 days as typhoid fever. Hepatic injury could be due to vascular hyperactivity or due to catecholamine. Immune complexes and high ratio of antitrypsin to C3 have been seen in typhoid fever and more frequently in patients with complications including hepatitis.⁷⁻⁹

The boy has clinical features of both typhoid fever and that of hepatic involvement. He has abdominal pain, vomiting, loose motion which are very common symptom of typhoid fever. He also has yellow colouration of sclera & high-colour urine which also goes in favour of hepatitis. We all know Common physical signs are fever, toxemia, typhoid tongue, splenomegaly, hepatomegaly, relative-bradycardia, rose spots and abdominal tenderness.¹⁰

This boy in our study have fever, jaundice, typhoid tongue, hepatomegaly, dehydration, dyselectrolytemia which are combination of typhoid & hepatitis. Dehydration & dyselectrolytemia due to vomiting & loose motion. Features indicative of hepatic involvement which may be present alone or in combination are, hepatomegaly, jaundice, disturbed liver function tests and abnormal histology¹¹.

His biochemical profile shows hyperbilirubinemia, hypertransaminasemia & mildly elevated prothrombin time which is highly suggestive of acute hepatitis. Study shows that Mild to moderate anemia, hypoproteinemia, hypoalbuminemia, mild thrombocytopenia, deranged transaminases and alkaline phosphatase levels are usually observed in patients with typhoid fever and so is the case with typhoid hepatitis. More serious cases of salmonella hepatitis may present with deranged clotting profile (raised prothrombin time, bleeding time and clotting time). Though transaminase levels are high in

patients with salmonella hepatitis, but they are not as high as in viral hepatitis patients.¹² So our case has mildly elevated transaminase level.

Salmonella Hepatitis is usually mild and runs a benign course and may even be missed by the physician or it can be severe presenting with severe bleeding syndrome, hematemesis, or hepatic encephalopathy.¹³ Patient with Salmonella encephalopathy do not usually have asterixis/hepatic flap as opposed to patients in hepatic encephalopathy from other causes. Diagnosis of Salmonella Hepatitis is based on confirmation of typhoid fever and that of liver involvement.^{14,15}

In our case Typhoid fever was confirmed by isolation of the organisms from blood culture. We know that typhoid fever can be isolated from different media e.g. blood, bone marrow aspirate, rose spots, urine, faeces and bile.¹⁵ Most important of these are blood and bone marrow culture.^{15,16} Bone marrow culture is considered to be the most sensitive single method for isolating these organisms especially in patients who have already used antibiotics.¹⁷ As we sent blood culture before starting antibiotic of our patient & Salmonella isolated from blood we didn't sent bone marrow. Diagnosis can be confirmed by changes in biopsy specimens from liver or kidney.¹⁸ In this case patient party refused to do biopsy for financial problem. As other criteria of Salmonella hepatitis was fulfilled so we didn't do the liver biopsy.

The differential diagnosis of Salmonella hepatitis can be Viral Hepatitis, Malarial Hepatitis, Amoebic Hepatitis etc.¹⁹ In viral hepatitis, marked anorexia and fever usually precede the illness and as jaundice appears, the fever subsides. In salmonella hepatitis, fever and jaundice co-exist at the peak of the disease course.²⁰ Our case has co-existence of fever & jaundice Histopathologically, in viral hepatitis there is acute diffuse inflammation with necrosis of the liver cells but without any fatty change. In malarial hepatitis, there is Kupffer cell hyperplasia with brown pigmentation and non-specific granulomatous lesion. Focal necrotic areas are seen in amoebic hepatitis,²¹ The ALT/LDH ratio on admission has also been found to differentiate salmonella hepatitis from viral hepatitis. If less than 9, it is suggestive of salmonella hepatitis; if greater than 9 it is suggestive of viral hepatitis.²² Our case has ALT/AST=3 which is suggestive of Salmonella hepatitis.

Treatment of typhoid hepatitis is the same as that of enteric fever. We commonly use three drugs Ciprofloxacin, Azithromycin & Ceftriaxon.²³ In this case we treated the patient with intravenous Ceftriaxon 2gram per day for 10 days. We also give some supportive treatment like correction of dehydration with intravenous cholera saline, correction of hyponatremia with 3.5% NaCl solution, Hypokalemia with injection KCl calculating the base deficit. His coagulopathy was corrected with inj. Vitamin K. With these treatment he

recovered very rapidly. His all Biochemical parameters were within normal limit in his F/up after 15 days. So we diagnosed the case as Salmonella hepatitis as it fulfills PSH Guidelines criteria & recovered with the treatment of Enteric fever.

The prognosis is usually good as Salmonella Hepatitis responds well to a specific antibiotic therapy and resolves with clinical improvement. The clinical course can be severe with a mortality rate as high as 20% particularly with delayed treatment or in complications of salmonella infections.²⁴

Conclusion:

When a patient with high fever, presents with jaundice and rise in transaminase and bilirubin, Salmonella hepatitis is a probable diagnosis. Salmonella hepatitis respond well to proper antibiotic therapy and has an excellent prognosis.

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