

Severe Jaundice in a patient with Acute Hepatitis - E Infection with Coexistent Glucose-6-Phosphate Dehydrogenase Deficiency

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ABSTRACT

Hepatitis E is prevalent in most developing countries, and common in any country with a hot climate. Hepatitis E virus is one of the common causes of acute viral hepatitis in India but usually manifests as a mild self-limiting illness. Viral hepatitis in the presence of glucose-6-phosphate dehydrogenase (G6PD) deficiency may be associated with complications such as severe anemia, hemolysis, renal failure, hepatic encephalopathy and even death. The incidence of G6PD deficiency in the general population of northern India is reported to be between 2.2% and 14%. The coexistence of viral hepatitis and G6PD deficiency has been reported to be associated with severe jaundice and other complications [1,2]. Hepatitis E infection with G6PD deficiency has been associated with more severe illness in only one previous report [3]. We report an additional case.

Key words:

Glucose-6-phosphate dehydrogenase, Hemolysis, Hepatitis E

Introduction

Hepatitis E is prevalent in most developing countries, and common in any country with a hot climate. Hepatitis E virus is one of the common causes of acute viral hepatitis in India but usually manifests as a mild self-limiting illness. Viral hepatitis in the presence of glucose-6-phosphate dehydrogenase (G6PD) deficiency may be associated with complications such as severe anemia, hemolysis, renal failure, hepatic encephalopathy and even death. The incidence of G6PD deficiency in the general population of northern India is reported to be between 2.2% and 14%. The coexistence of viral hepatitis and G6PD deficiency has been reported to be associated with severe jaundice and other complications [1,2]. Hepatitis E infection with G6PD deficiency has been associated with more severe illness in only one previous report [3]. We report an additional case.

Case Report

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18 years old male patient presented with mild to moderate fever without chills, upper abdominal pain, fatigue and loss of appetite for 4 days. He had noticed a yellow discoloration of the eyes and dark colored urine for one day. There was no history of alcohol consumption or previous history of liver disease. On the 5th day, he developed vomiting. For which he got admitted to the hospital. On examination, he was icteric. Abdominal examination revealed a soft, tender hepatomegaly, palpable 2 cms below the costal margin. There was no splenomegaly or lymphadenopathy and no other significant physical findings.

Next day of admission, he developed fever with chills and back pain along with vomiting. He became more deeply icteric within 24 hours. His Hemoglobin which was 13.3 dropped to 8.6 within 12 hours. Bilirubin risen to 14.4 to 41.5 over 12 hours and within 24 hours risen to 49.5 Leucocytes count risen to 12,790 to 22,740 over 12 hours and 46,460 within 48 hours. There was no evidence of hepatic encephalopathy. Since there was acute drop in hemoglobin, patient was having severe weakness and breathless, one packed cell transfusion was given.

Laboratory investigations revealed Prothrombin time was 14 s (control: 12 s) INR 1.16. Immunoglobulin IgM anti-hepatitis A virus, hepatitis B surface antigen, IgM anti-hepatitis B core and anti-hepatitis C virus were negative, while IgM anti-hepatitis E virus (HEV) was positive. A diagnosis of HEV hepatitis was made.

His laboratory investigations are as follow:

Date	14/7 (morn)	14/7 (evening)	15/7	18/7	19/7	22/7	25/7	27/7
Hb	13.3	8.6	8.3	7.1	8.0	8.9	9.8	10.2
WBC	12790	22740	43380	46460	10930	7090	7380	6700
T.BIL	14.4	41.5	49.5	46	45	15.5	14.0	13.4
D.BIL	6.9	26.5	28.5	27.5	25	7.5	8.0	6.8
SGOT	2570	7030	8030	1140	1909	570	159	129
SGPT	4420	6700	7109	5407	2740	233	335	240

The peripheral blood smear showed polychromasia, anisopoikilocytosis, Microcytosis, plenty of Burr Cells, Few Bite cells and few spherocytes and reticulocytosis (reticulocyte count was 12%). Urine was positive for hemoglobinuria. Osmotic fragility test – hemolysis starts at 0.6% and completed at 0.3% of NS (reported as normal). LDH 1385 (N 225- 450 IU/L)

Estimation of G6PD level: More than 1 hours (N: 30- 60 minutes)

Coomb's Test: Direct as well as Indirect — Negative

The patient was managed conservatively, including avoiding all hepatotoxic, nephrotoxic and oxidant drugs, and maintaining an adequate urine output. Patient improved over period of three weeks.

Discussion

Hepatitis E virus (HEV) is an icosahedral, nonenveloped single stranded RNA virus that is approximately 27 to 34 nm in diameter (4). It has been classified as the single member of the genus hepevirus in the family Hepeviridae.

Mild hemolysis associated with decreased red blood cell survival may be commonly seen with viral hepatitis, but is seldom of clinical significance (5). However, when viral hepatitis occurs in G6PD-deficient patients, hemolysis may be severe (6).

The patient described in this case had severe intravascular hemolysis as evidenced by a rapid fall in hemoglobin, sudden rise in bilirubin, and hemoglobinuria. Profound hemolysis in G6PD-deficient individuals is usually

precipitated by exposure to selected drugs. However, as in this case, viral hepatitis may precipitate massive hemolysis even without the intake of such drugs. The mechanism of hemolysis is thought to occur through decreased levels of reduced glutathione in red blood cells (7). Reduced glutathione levels could result from the accumulation of oxidants due to hepatic dysfunction and lead to increased hemolysis in the presence of G6PD deficiency. Despite the high levels of bilirubin in these patients, the prognosis is mainly related to the severity of hepatic injury (8). Acute renal insufficiency, though uncommon in uncomplicated acute viral hepatitis, can occur as a fatal complication of severe intravascular hemolysis in these patients (6). Excess hematin and bilirubin may result in the obstruction of renal tubules, leading to acute renal insufficiency with increased morbidity. Renal failure may be non-oliguric, therefore, kidney function should be assessed by regularly monitoring blood chemistry, and urinary sodium and osmolarity. Measures to prevent renal failure include maintaining good hydration and adequate urine output, and avoiding nephrotoxic drugs(9).

HEV infection is transmitted through the feco-oral route but, unlike other enteric agents, does not generally spread from infected persons to their close contacts (10).

In patients with acute viral hepatitis and unexplained anemia with very high serum bilirubin levels, intravascular hemolysis should be considered and investigated.

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