Case report: Acute hepatitis E infection with coexistent glucose-6-phosphate dehydrogenase deficiency


Hepatitis E virus is one of the leading 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 anaemia, 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%. Despite both hepatitis E infection and G6PD deficiency being common, their impact on patient illness has only recently been reported. The present study reports a case of severe hemolysis in a patient with G6PD deficiency and hepatitis E infection.

Key words: Glucose-6-phosphate dehydrogenase; G6PD; Hemolysis; Hepatitis E

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gradually improved over the subsequent five weeks. The hemoglobin mass concentration increased to 98 g/L, bilirubin fell to 161 µmol/L (conjugated fraction: 99 µmol/L), AST fell to 176 U/L, ALT fell to 281 U/L and reticulocyte count fell to 4.4%. The patient was discharged to be followed in the outpatient department. Ten weeks after the onset of illness the patient's G6PD level was 1.1 U/gHb, and his serum bilirubin and aminotransferase levels were nearly normal. About one month after the onset of illness, the patient's wife, who nursed him through the course of this illness, also developed jaundice and was diagnosed with HEV hepatitis.

**DISCUSSION**

Mild hemolysis associated with decreased red blood cell survival may be commonly seen with viral hepatitis, but is seldom of clinical significance (6,7). However, when viral hepatitis occurs in G6PD-deficient patients, hemolysis may be severe (7,8).

The patient described in this case had severe intravascular hemolysis as evidenced by a fall in hemoglobin, reticulocytosis, unconjugated hyperbilirubinemia, hemoglobinuria and undetectable serum haptoglobin levels. The presence of severe hyperbilirubinemia in patients with viral hepatitis and G6PD deficiency has been previously reported (9-11). In a case control study, Gotsman and Muskat (12) evaluated the impact of G6PD deficiency on patients with Hepatitis A virus infection. They found that although patients with G6PD deficiency had a more severe initial clinical presentation, the clinical outcome was not affected. Abid and Khan (5) recently reported a cohort of five patients from Pakistan with G6PD deficiency and Hepatitis E virus infection. All five patients had severe and protracted illness, and four developed acute renal failure.

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 (5,7,10). The mechanism of hemolysis is thought to occur through decreased levels of reduced glutathione in red blood cells (6). 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 (9). Acute renal insufficiency, though uncommon in uncomplicated acute viral hepatitis, can occur as a fatal complication of severe intravascular hemolysis in these patients (3). Excess hematin and bilirubin may result in the obstruction of renal tubules, leading to acute renal insufficiency with increased morbidity. Renal failure may be nonoliguric; 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.

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 (13). In the present case, one month after the onset of jaundice in the patient his wife also contracted HEV. Because the incubation period of HEV ranges from 14 to 60 days, it is likely that she contracted the virus from her husband, rather than from a common source.

In patients with acute viral hepatitis and unexplained anemia with very high serum bilirubin levels, intravascular hemolysis should be considered and investigated. Wilson’s disease may present with jaundice and hemolysis and must be excluded. Tests for G6PD deficiency may be negative during and immediately after a hemolytic episode because the old red blood cells deficient in G6PD have been hemolysed and the higher content of G6DP in the new red blood cells may lead to false normal levels. A repeat test should be done eight to 10 weeks after the disease resolves. When G6PD deficiency is suspected, treatment with vitamin K should be avoided because it may further aggravate hemolysis (14). Finally, all G6PD-deficient individuals should be vaccinated against Hepatitis A and B. Universal immunization against HAV and HBV for communities with high prevalences of G6PD deficiencies (eg, Vataliya-Prajapati community in western India [15], Muria gonds of central India [16], etc) should also be considered.

**REFERENCES**
