HEV-related Liver Disease in India : Why is the Disease Stormy?

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HEV-related Liver Disease in India: Why is the Disease Stormy?

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Abstract:

Hepatitis E virus (HEV) is an important cause of epidemic and sporadic acute viral hepatitis (AVH) in many developing countries, including India. Hepatitis E, a positive-sense single-stranded RNA virus approximately 7.2 kb in length had been classified provisionally into the Caliciviridae family from 1988 to 1998 but HEV is currently placed in the genus Hepevirus and is the only member of the family Hepeviridae. Pregnant women with jaundice and AVH caused by HEV infection have worse fetal and obstetric outcome and higher maternal mortality compared to other types of viral hepatitis. Studies from various developing countries have shown that the incidence of HEV infection in pregnancy is high and a significant proportion of pregnant women can progress to fulminant hepatitis with a mortality rate varying from 30% to 100%. The incidence of hepatitis B virus (HBV) related acute liver failure is known widely in comparison to hepatitis C virus (HCV) infection in which acute liver failure (ALF) is rare. But the severe course of HEV infection causing ALF during pregnancy is unique to this virus with chronicity occurring in recipients of solid organ transplants.

Various factors have been suggested to be associated with the mortality rate of the HEV in pregnant women along with the abortion of the fetus. Steroid hormones play a significant role in the viral replication through their effects on viral regulatory elements. The NF-κB signaling pathway regulating at the transcriptional level through p50 subunits has been suggested to correlate with the severe liver damage, leading to multiple organ failure and the death of both the mother and the fetus. Pregnant women in Asia suffer from folate deficiency reducing the immunocompetence to greater risk of multiple viral infections and higher viral load. The viral load of HEV was found to be significantly higher ($P < 0.05$) in pregnant patients compared to the non-pregnant and the viral copies of HEV with fulminant hepatic failure (FHF) in pregnant women were comparatively higher when compared to the pregnant women with AVH, which may be related to the severity of the disease in these patients. Besides, reduced expression of progesterone and progesterone induced-blocking factor and the high viral load of HEV have been regarded as a cause of poor pregnancy outcome in hepatitis E infection. Vertical

transmission of the HEV infection has been reported. There are published reports of abortion, death of the fetus in utero, premature delivery or death of the baby soon after birth in patients with icteric hepatitis or with ALF caused by HEV. However, studies in Europe and United States have shown the course of viral hepatitis during pregnancy resembling with the non-pregnant women. In contrast, various reports carried out in India, Iran, Africa, and Middle East have reported the incidence of ALF to be higher during pregnancy.

Data on the viral load of HEV during pregnancy are limited. The study was designed to determine the viral load of HEV and its association with the disease severity in patients with ALF. A total HEV related 163 patients with ALF which included 105 pregnant, 46 non-pregnant women and girls, 12 men, and 730 patients with AVH which comprised of 220 pregnant women; 282 non-pregnant women and girls, and 228 men were included. Viral load was measured by real-time PCR. Comparison was made between the pregnant and non-pregnant women. HEV RNA was detectable in 265 patients (142 pregnant; 75 non-pregnant and 48 men) and 104 patients with ALF (64 pregnant, 34 non-pregnant and 6 men). The viral load of HEV in pregnant women with ALF and AVH was significantly higher 129,984.0±103,104.17 and 768.92±1,105.40 copies/ml, respectively compared to the non-pregnant women which was 189.2±225 and 12.73±7.8 copies/ml ($P < 0.0001$). The viral load of HEV was also significantly higher in the pregnant patients with ALF compared to the pregnant women with AVH and also men ($P < 0.0001$). High viral load of HEV during pregnancy could be one of the factors responsible for the severity of the infection during pregnancy.

Keywords: Immunocompetence, HEV during pregnancy, acute liver failure, acute viral hepatitis.

Reference:

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