Hepatitis E virus superinfection and clinical progression in hepatitis B patients

Research scientists from the Institute of Tropical Medicine Tübingen and the Robert Koch Institute in cooperation with Vietnamese scientists, have recently published a study on the burden of hepatitis E virus (HEV) infection in patients chronically infected with hepatitis B virus (HBV) in the EBioMedicine Journal. The study team discovered that the rate of HEV infection is higher in HBV patients than in the healthy population. The study also reports that hepatitis B patients with a HEV infection, develop progressive HBV-related liver diseases faster including liver cirrhosis and liver cancer.

Hepatitis E virus (HEV) is a major cause of acute viral hepatitis and the causative agent of hepatitis E in both resource-limited regions and developed countries. HEV is endemic in Central- and South-East Asia, India, Africa, and South America. According to the World Health Organization (WHO), more than one third of the world’s population is living in high risk regions for acquiring HEV infection. There are more than 20 million incidents of HEV-infections per year mainly in tropical countries, with more than 3 million acute cases of hepatitis E and more than 55,000 hepatitis E-related deaths. HEV infection can also cause hepatic failure in several specific patient groups such as pregnant women, children, patients having organ transplantations and HIV patients.

The team was led by Dr. Thirumalaisamy P Velavan from the Institute of Tropical Medicine Tübingen, and Prof. C.-Thomas Bock representing the Robert Koch Institute, Berlin. The Vietnamese cooperation partners Prof. Dr. Le Huu Song, the vice director of 108 Military Central hospital, and Prof. Dr. Nguyen Linh Toan, Head of molecular pathophysiology at the Vietnam Military Medical University are alumnus of University of Tübingen and have been long standing cooperation partners in the field of hepatitis research.

Dr. Nghiem Xuan Hoan, from 108 Military hospital, Hanoi and Dr. Hoang van Tong from the Institute of Tropical Medicine, Tübingen examined a total of 1318 clinically classified HBV patients and 340 healthy controls for HEV infection. About 45% of the HBV patients and 30% of the healthy people have been infected with HEV. Approximately 12% of the HBV patients may have current HEV infection compared to 5% in healthy people. The authors additionally found that the patients with liver cirrhosis had higher rates of HEV infection compared to the patients who did not have cirrhosis. Hepatitis B patients with active HEV infection had abnormal liver function tests in comparison to either HBV patients who had HEV infection in the past or HBV patients who had never had HEV infection. According to Dr. Velavan, this is an interesting finding showing that HEV infection is significantly associated with liver cirrhosis development in the patients infected with HBV. In other words, HEV infection can speed up the progression of liver disease toward the worst outcome.

Prof C.-Thomas Bock said “in industrialized countries, such as Germany, HEV infection is sporadic. However, recent studies have shown that an increasing number of autochthone cases could be detected due to HEV genotype 3-infection possibly transmitted by zoonotic HEV, via ingestion of raw or undercooked meat and often from swine. Also transmission of HEV via blood transfusion has become more likely according to recent reports. Between 2004 and 2015 a dramatic increase of more than 30-fold of reported HEV cases with 1345 acute HEV in 2015 have been documented in Germany”. Dr. Velavan, a group leader and also the coordinator for the DAAD-PAGEL project with Vietnam said that “in Vietnam, HBV infection is one of the main health problems with more than 15% of the population living with chronic hepatitis B and it is clear that the HBV patients are one of the risk groups for acquiring HEV infection which is transmitted through...
fecal-oral route”.
Prof. Peter G Kremsner, the director and Chair of the Institute of Tropical Medicine, said the study has opened up several new research aspects in terms of HEV infection in different groups such as children, pregnant women and patients who have compromised immune systems. More studies will help understand the contribution of HEV towards pathogenesis during superinfections.

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