Ascertaining the prevalence of occult hepatitis B virus infection in voluntary blood donors: A study from Central India

Sir,

Occult hepatitis B virus infection (OHBI) is a well-recognized clinical entity and is not restricted only to regions with high hepatitis B virus (HBV) endemicity.[1] According to European Association for the Study of the Liver, OHBI is defined as cases negative for hepatitis B surface antigen (HBsAg) but positive for the presence of HBV DNA.[2] Although, molecular mechanisms responsible for this cryptic infection is unknown, OHBI is considered to represent a window period of acute infection, or chronic infection with reduced viral replication, or an escape mutant in pre-S region resulting in undetectable HBsAg in the peripheral axis.[3] Due to such high unpredictability and ability to escape normal pretransfusion serological testing, OHBI represents to be a major threat of transmission through blood transfusion. It has been also reported earlier that OHBI presents a higher risk of transfusion-transmitted infection than hepatitis C virus or human immunodeficiency virus.[4] Transfusion of infected blood might have far-reaching consequences, not only for the recipients themselves, but also for their families, communities, and the wider society. Thus, cautious screening of OHBI in blood donors and health care workers is indispensable.

In order to determine the occult phenomenon in the Central Indian population, we performed a study in 100 healthy health care workers and 1000 healthy blood donors. The study was approved by the institutional review board and informed consent was obtained from all individuals included in the study. Qualitative screening of HBsAg and anti-HBcAg (total) was done through standard ELISA (Diasorin S.p.A. Saluggia, Vercelli, Italy), while nucleic acid analysis was performed through real time PCR (Light Cycler 2.0, Roche Diagnostics, Mannheim, Germany; minimum detection limit 10 copies/ml) using fluorescence resonance energy transfer probes. The primers, which recognized a core region of HBV (forward primer 5′-TCGGAG TGTGGATTCGCACTCCTC-3′, nucleotide position 2,265-2,288 and reverse primer 5′-GATTGAGACCTTCCTCTGCGAGGC-3′, nucleotide position 2,322-2,415) were used along with internal controls and known quantitative standards.

All the samples tested were negative for the presence of HBsAg through standard ELISA. However, nucleic acid analysis of these samples using a quantitative PCR approach showed that out of 1000 screened healthy blood donors, 22 cases (2.2%) were positive for the presence of HBV DNA, i.e., OHBI with values ≤100 copies/ml, while no health care worker was reported positive. Out of these 22 cases, 20 were found positive for anti-HBcAg, while 2 were reported negative suggesting sero-negative OHBI.

In conclusion, it is a unique attempt to determine the frequency and importance of determining OHBI in healthy blood donors of Central India. Results of our study signify the importance of implementing HBV nucleic acid testing, either in mini-pools or more efficiently in individual samples to reduce the residual risk of transfusion-related transmission of OHBI. In addition, such studies not only create health awareness, but also evoke a perpetual social consciousness, concerning safety and usage of blood products.

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