OCCULT HEPATITIS B VIRUS INFECTION IN BLOOD DONORS MISSED BY STANDARD HEPATITIS B SCREENING

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Introduction: Screening of blood donations for the presence of HBsAg and HBV-DNA is current standard of technique and is used for selection of HBV negative blood donations. However, improvements of HBV-nucleic acid amplification testing (NAT) techniques (mini-pool (MP) versus individual donation (ID)) revealed donors with trace HBV viremia which were not recognized by previous screening protocols. Regularly, donors with trace viremia show antibodies to the hepatitis B core antigen (anti-HBc) suggesting an occult hepatitis B infection (OBI). The aim of this quality assurance was to quantify donors with an occult hepatitis B infection in the blood donor collective and thereby assess the risk of releasing potentially infectious blood products with extremely low levels of HBV DNA.

Methods: During a one-month period, all whole blood, platelet and plasma donors (new and multiple donors) were examined for the presence of anti-HBc and HBV surface antibodies (anti-HBs, Architect®, Abbott) in addition to standard HBV screening (HBV-ID-NAT, cobas® MPX, Roche Transfus Med Hemother 2018;45(suppl 1):1–90 Diagnostics) and HBsAg EIA (Architect®, Abbott). Anti-HBc positive findings were confirmed by anti-HBc neutralisation test using recombinant HBcAg (Architect®, Abbott. J Clin Virol. 2011 Aug;51(4):283–4). Confirmed anti-HBc positive samples underwent ultracentrifugation (UC) and subsequent testing of HBV-ID-NAT to search for traces of HBV. Archived donor»s samples of confirmed anti-HBc positive donations were reassessed by HBV-ID-NAT.

Results: Of the 4923 donors tested, 78 (1.6%) were confirmed positive for anti-HBc. For 69 of these donors we had a fresh frozen plasma (FFP) unit for UC. **4/69** FFP units were HBV-PCR positive upon UC. **62/78** anti-HBc positive donors were reassessed using their archived samples. One donation previously declared HBV negative by MP-NAT turned out to be HBV-DNA positive by ID-NAT. Therefore, among the 78 confirmed anti-HBc positive donors, **5** donors with OBI were detected. This corresponds to 6.4% OBI donors among individuals with confirmed positive anti-HBc test. The anti-HBs titers of OBI donors varied between 80 and 1000 IU/l and were not different from non-viremic anti-HBc positive individuals.

Conclusions: The rate of donors who have ever had a HBV infection is low, making up 1.6% of the blood donors in the Zurich area. The number of donors with an occult HBV infection among anti-HBc confirmed positive donors is unexpectedly high at 6.4%. Improved screening protocols to efficiently exclude OBI donors from blood donation seem advisable, since transfusion-transmitted HBV infections by donors with OBI have been described (Lieshout-Krikke et al.: 2015, Transfusion).

Conflict of interest: Additional Testkits for Anti-HBc and Anti-HBs for this study were donated by Abbott®.