Intravenous literature: Vermeulen, M., Dickens, C., Lelie, N., Walker, E., Coleman, C., Keyter, M., Reddy, R., Crookes, R. and Kramvis, A. (2011) Hepatitis B virus transmission by blood transfusion during 4 years of individual-donation nucleic acid testing in South Africa: estimated and observed window period risk. Transfusion. 7th Oct 2011 .

Abstract:

BACKGROUND: Since October 2005, a total of 2,921,561 blood donations have been screened by the South African National Blood Service for hepatitis B virus (HBV) by individual-donation nucleic acid testing (ID-NAT). Over 4 years, 149 hepatitis B surface antigenâ€“negative acute-phase HBV NATâ€“positive donations were identified (1:19,608). The lookback program identified one probable HBV transmission.

STUDY DESIGN AND METHODS: The complete genomes of HBV isolated from the donor and recipient were sequenced, cloned, and analyzed phylogenetically. The HBV window period (WP) transmission risk was estimated assuming a minimum infectious dose of 3.7 HBV virions and an incidence rate correction factor of 1.34 for transient detectability of HBV DNA.

RESULTS: Of 149 acute-phase HBV NAT yields, 114 (1:25,627) were classified as preâ€“antibody to hepatitis B core antigen (anti-HBc) WP and 35 (1:83,473) as postâ€“anti-HBc WP. The acute-phase transmission risk in the HBV DNAâ€“negative pre- and postâ€“anti-HBc WPs (of 15.3 and 1.3 days, respectively) was estimated at 1:40,000 and 1:480,000, respectively. One HBV transmission (1:2,900,000) was identified in a patient who received a

transfusion from an ID-NATâ€“nonreactive donor in the preâ€“anti-HBc WP. Sequence analysis confirmed transmission of HBV Subgenotype A1 with 99.7% nucleotide homology between donor and recipient strains. The viral burden in the infectious red blood cell unit was estimated at 32 (22-43) HBV DNA copies/20 mL of plasma.

CONCLUSION: We report the first known case of transfusion-transmitted HBV infection by blood screened using ID-NAT giving an observed HBV transmission rate of 0.34 per million. The estimated preâ€“acute-phase transmission risk in the ID-NAT screened donor population was 73-fold higher than the observed WP transmission rate.