

OCCULT HBV INFECTIONS IN THE ACUTE AND CHRONIC STAGE INTERDICTED BY TRANSCRIPTION MEDIATED AMPLIFICATION (TMA) TESTING OF SMALL DONOR POOLS (P-231)

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BACKGROUND

National surveillance of hepatitis B serology and NAT screening results (Hernández et al), showed that the HBV-DNA TMA yield rate (ULTRIO) in Spain was higher when applied on individual donations (ID) than on minipools (MP) of 8 donations (1:10,500 vs 1:39,600). A study with PROCLEIX® ULTRIO® Assay among French HBsAg positive donors also showed a higher sensitivity of ID-NAT than MP-NAT (98% vs 84%).

AIM

We studied the relative diagnostic sensitivity of HBsAg and HBV-DNA testing and characterised yield cases not detectable in either NAT or serology screening.

METHODS

We determined the number of HBsAg and HBV-DNA reactive donors interdicted by serology (PRISM) and MP-NAT screening (ULTRIO, pools of 8) over a two-year study period (2005- 2006). HBsAg repeat reactive donors that were MP-NAT negative were tested in ID-NAT and for other HBV serum markers. HBsAg repeat reactive donors that were also ID-NAT negative were considered confirmed positive if anti-HBc was reactive. HBV-NAT yield cases were confirmed by viral load (Q-PCR), while the S gene was sequenced for determination of the genotype and presence of immune escape mutations.

RESULTS

The HBsAg prevalence was 162 in 255055 donations (0.0635%). The percentage of HBsAg positive donors with detectable HBV-DNA increased from 77,8% with MP-NAT to 91,2% with ID-NAT. Of 17 HBV-DNA negative carriers, 4 were anti-HBs reactive, 14 had HBsAg S/CO<100 and 7<10. MP-NAT identified 5 occult carriers with viral loads varying from ~50 to 650 cps/ml (rate 1:51,000). Sequence analysis of the S region showed genotype D and multiple escape mutations in 4 occult HBV carriers with and without detectable anti-HBs. MP-NAT identified one acute infection with a viral load of ~100,000 cps/ml, while the PRISM S/CO was repeatedly negative (S/CO 0,63). At day 37 after the donation HBV-DNA was still detectable in ID, while anti-HBc and anti-HBs (>1000 IU/L) had become reactive. Sequence analysis of the S region showed wild type genotype D. Molecular and physico-chemical analysis of viral particles by Prof. Gerlich et al may explain the low HBsAg expression in the acutely infected donor.

CONCLUSION

Viral loads in chronic genotype D infection may be generally lower than in other HBV genotypes, which could explain the relatively high number of occult HBV infections and HBsAg carriers with undetectable HBV-DNA in our blood donor population. Highly sensitive HBV-DNA assays, whole genome analysis and viral expression studies may further elucidate the nature of in these occult infections.