

Immunological and Molecular Characterization of Hepatitis B Virus in Asymptomatic Voluntary Blood Donors

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It is mandatory to test each donor's blood for syphilis by a VDRL, and for HBsAg, anti-HCV, and anti-HIV. In July 1989, consequent to the reports of high seroprevalence in commercial blood donors, mandatory screening of blood and blood products for HIV antibodies was initiated by Indian NACO. The first objective of this study is to estimate the seroprevalence of TTIs among voluntary blood donors at Chennai. This knowledge might give us the idea of disease burden of the society and the basic epidemiology of these diseases in the rural community. Hence in the current study, more importance has been given to explore more on the role of the other serological markers as well as molecular HBV markers that could serve as an surrogate marker in detecting the hidden HBV so that transfusion transmitted HBV is lowered considerably

Objectives of the study :

The first objective of this study is to explore the current sero-prevalence of HBsAg, anti-HCV and anti-HIV among the voluntary blood donors by the routine rapid assays (card test) and by the ELISA methods.

The second objective is to explore the real efficiency of NAT tests in terms of increased sensitivity in identifying the potential pathogens in voluntary blood donors who are found negative by the regular serological assays used by the blood banks for the routine screening.

The third objective of this study is to compare the positivity of HBV, HCV and HIV by both the serological markers (carried out by the routine card test and ELISA method tests) and by the NAT (using the molecular markers) in voluntary blood donors.

The role of HBV seromarkers in identifying the HBV disease status in HBsAg positive cases – to study the pattern of HBV serological profile for identifying the stage of HBV stage in chronic HBV infected subjects among voluntary blood donors who are asymptomatic and also identify the cryptic cases

To identify the nonresponders in vaccinated population amongst the blood donors who are HBsAg positive

To study the relevance of the seromarkers and HBV viral load to establish the fact that inclusion of one or more seromarkers in routine blood screening would be beneficial

To estimate the liver function test to determine the extent of damage of liver
To study the HLA pattern in hosts affected by the virus to study the occurrence of the protective gene that helps host to remain asymptomatic but they would be carriers

Results ;Out of 3160 voluntary blood donors 126 were found to be positive for HBsAg(3.9%), 2 were found positive for HCV and 2 were found positive for HIV by the routine card test.

For the detection of HCV and HIV, NAT was employed and it was able to pick-up the cases that were picked up by the routine card test, it was not able to pick-up any new additional positives.

Through the routine card test only 126 samples were found to be positive for HBsAg, but from the same group ELISA was able to pick up 6 more HBsAg positive cases. In addition NAT picked up two more positives from the same group of 3160 voluntary blood donors. So through the ELISA the HBsAg prevalence was found to 4.1% (by picking up 6 additional positive cases). And with the help of the NAT the HBV prevalence was found to be 4.2% (by picking up two more HBV positives). And by employing the NAT for the detection of HBV-DNA the prevalence was found to be 4.2% (by picking up two more HBV positive cases which were missed by the regular Card test and ELISA).

134 voluntary blood donors were found positive for HBsAg,

Out of the 134 HBsAg positive , 79 were in the age group of 18 to 38 years, and the rest 55 were in the age group of 39-59 years.

The HBsAg positive group consisted of 89% male and 10.5% females.

71.7% of them were graduates and 28.3 % were illiterates.