

Risk Factors for Determining Anti-HBcore to Hepatitis B Virus Among Blood Donors

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Abstract : Introduction. The problem of viral hepatitis B (HBV) takes a vital place in the global health system. The existing risk of HBV transmission through blood transfusions is associated with transfusion of blood taken from infected individuals during the "serological window" period or from patients with latent HBV infection, the marker of which is anti-HBcore. In the absence of information about other markers of hepatitis B, the presence of anti-HBcore suggests that a person may be actively infected or has suffered hepatitis B in the past and has immunity. Aim. To study the risk factors influencing the positive anti-HBcore indicators among the donor population. Materials and Methods. The study was conducted in 2021 in the Scientific and Production Center of Transfusiology of the Ministry of Healthcare in Kazakhstan. The samples taken from blood donors were tested for anti-HBcore, by CLIA on the Architect i2000SR (ABBOTT). A special questionnaire was developed for the blood donors' socio-demographic characteristics. Statistical analysis was conducted by the R software (version 4.1.1, USA, 2021). Results. 5709 people aged 18 to 66 years were included in the study, the proportion of men and women was 68.17% and 31.83%, respectively. The average age of the participants was 35.7 years. A weighted multivariable mixed effects logistic regression analysis showed that age ($p < 0.001$), ethnicity ($p < 0.05$), and marital status ($p < 0.05$) were statistically associated with anti-HBcore positivity. In particular, analysis adjusting for gender, nationality, education, marital status, family history of hepatitis, blood transfusion, injections, and surgical interventions, with a one-year increase in age ($\text{adjOR} = 1.06$, $95\% \text{CI}: 1.05-1.07$), showed a 6% growth in odds of having anti-HBcore positive results. Those who were Russian ethnicity ($\text{adjOR} = 0.65$, $95\% \text{CI}: 0.46-0.93$) and representatives of other nationality groups ($\text{adjOR} = 0.56$, $95\% \text{CI}: 0.37-0.85$) had lower odds of having anti-HBcore when compared to Kazakhs when controlling for other covariant variables. Among singles, the odds of having a positive anti-HBcore were lower by 29% ($\text{adjOR} = 0.71$, $95\% \text{CI}: 0.57-0.89$) compared to married participants when adjusting for other variables. Conclusions. Kazakhstan is one of the countries with medium endemicity of HBV prevalence (2%-7%). Results of the study demonstrated the possibility to form a profile of risk factors (age, nationality, marital status). Taking into account the data, it is recommended to increase attention to donor questionnaires by adding leading questions and to improve preventive measures to prevent HBV. Funding. This research was supported by a grant from Abbott Laboratories.

Keywords : anti-HBcore, blood donor, donation, hepatitis B virus, occult hepatitis

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