Seroprevalence of Hepatitis E Virus and The Rate of Co-infection with other Viruses in Blood Donors in Oyo State, Nigeria: A Pilot Study

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Summary

Hepatitis E Virus (HEV) infection is a major public health challenge in developing countries where it has caused large waterborne epidemics. However, the risk of transfusion-transmitted HEV through contaminated blood and blood products remains unknown.This cross-sectional study aimed at determining the seroprevalence of HEV among 186 blood donors who visited the University College Hospital blood bank, Ibadan in Nigeria, between January and June, 2018.Five ml of venous blood was drawn from each subject into plain sample bottles. The sera were analyzed for HEV, HCV, HBsAg, HIV and VDRL via ELISA techniques. Our findings showed HEV (4.3%) to be the most prevalent transfusion-transmissible infections (TTIs), followed by HIV (3.2%), HBV (3.2%), HCV (2.7%) and syphilis (1.1%). Prevalence rate of HEV/HIV co-infection recorded was 0.54%, HBsAg/HCV co-infection was 0.58% while HBsAg/HIV co-infection was 1.08 %. Also, statistical relationship was observed between HEV and increasing age (P = 0.038). Among the seropositive donors 62.5% reported to have donated blood in the past. In conclusion, the study showed a high seroprevalence rate of HEV among the donors; higher than the other routinely screened viral markers. Blood donors above age 30, which is the age bracket of most donors, have a higher probability of being seropositive. Thus posing significant health risks to blood transfusion recipients. Hence, it is recommended that HEV be routinely screened for along with other viral TTIs.

Keywords: Seroprevalence, Blood Donors, Blood Transfusion, Co-infection, Hepatitis E Virus, Nigeria

Introduction

Current efforts and strategies have greatly reduced the risk of transfusion-transmissible infections (TTIs). However, with emerging transfusion-transmissible human pathogens, the supply of safe blood remains an important issue in transfusion medicine. Although TTIs are sometimes subclinical they are a major public health concern associated with blood transfusion.

Hepatitis E virus (HEV), originally recognized as a member of the Calciviridae family but recently reclassified into the Hepevirus genus, is a small, spherical, non-enveloped, single-stranded RNA virus.[1,2] The virus has been found to be endemic in regions of the world characterized with poor sanitation (such as Africa, Asia and Central America). Faecal-oral route has been demonstrated by epidemiological studies to be the main route of transmission with contaminated food and water being the main sources of infection.[3,4] In developed countries, sporadic hepatitis E infection is mainly a zoonotic and foodborne disease, in contrast to the water-borne hepatitis E infection in endemic developing countries.[5,6]

Although human-to-human transmission remains uncommon, mother-to-child transmissions as well as transmission via blood transfusion have been recorded.[2,5,7,8] Also, transmission via blood transfusion therapy has been reported in a number of studies done in non-endemic countries[9-14] as well as endemic countries[15,16] making blood transfusion a possible risk factor for acquiring HEV.[17]

High rates of anti-HEV IgG seropositivity have been reported among blood donors in many countries, with varying prevalence rates; China - 0.07%, Scotland - 4.7%, United States - 18.8%, Germany - 5.94%, Switzerland - 4.9%, Brazil - 2.3%, France - 3.20% and Japan - 5.3%.[18-25] In Nigeria, population seroprevalence has been reported to range from 2.7% to 49.7% in different parts of the country.[14,17,26] However, there is limited data on the seroprevalence rate among blood donors. Studies have reported that blood products, including packed red blood cells,[9,10,27,28] platelets, as well as fresh frozen plasma[29-31] can transmit HEV. Also, the presence of HEV-RNA in both mini and large plasma pools,[30,32] including those for fractionation,[33] has been reported in Europe and north America.

Transfusion-transmitted hepatitis E virus infection from contaminated blood and blood products has been reported in Europe as well as Japan.[10,12,30,34,35] An observed increase in the incidence of transfusion-transmitted hepatitis E virus infection in Japan has led