



Original Research Article

Prevalence of Hepatitis B Virus Infection among Blood Donors

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A B S T R A C T

Keywords

HBsAg,
Seroprevalence,
Blood donors,
Enzyme-linked
immunosorbent
assay (ELISA),
Transfusion
Transmissible
Infectious
(TTI)

Transfusion associated hepatitis B virus (TAHBV) infection continues to be a major problem despite mandatory screening for hepatitis B surface antigen (HBsAg). Hepatitis B is one of the transfusion transmissible infections. Hepatitis B virus (HBV) infection is associated with its sequelae such as cirrhosis of liver and hepatocellular carcinoma. The study was done between June 2012 and May 2014. A total of 2500 were taken for the study. Out of 2500 samples 1780 (71.2%) were males & 720 (28.8%) were females. A total of 2500 samples were screened, out of which 62 (2.48%) samples were positive for HBsAg. Replacement donors showed more seropositivity 2.69% than the voluntary donors 1.94%. The finding of the current study recommends that all blood units should be tested for HBsAg to understand the infectivity status of the blood donors in the window period and to discard blood if positive.

Introduction

Blood transfusion service (BTS) is an integral and indispensable part of the healthcare system. The priority objective of BTS is to ensure safety, adequacy, accessibility, and efficiency of blood supply at all levels (Islam, 2009). It is well known that blood transfusion is associated with a large number of complications, some are only trivial and others are potentially life threatening, demanding for meticulous pre-transfusion testing and screening. The use of unscreened blood transfusion keeps the patient at risk of acquiring many transfusion transmitted infections like Hepatitis B, Hepatitis C and HIV (Khan *et al.*, 2007).

Hepatitis B is a major public health problem worldwide. Approximately 30% of the world's population or about 2 billion persons have serological evidence of either current or past infection with hepatitis B virus. The prevalence of chronic HBV infection in India ranges from 2% to 10% as shown by different studies (World Health Organization, 2002). India therefore comes under the intermediate to high endemicity category.

Transfusion associated hepatitis B viral infection (TAHBV) continues to be a major problem in India even after adoption of

mandatory screening of hepatitis B surface antigen (HBsAg) by enzyme-linked immuno-sorbent assay (ELISA). The high incidence of TAHBV is reported in patients receiving multiple blood transfusions. It is based on this high prevalence, and the various sequelae of HBV infection, especially liver cirrhosis and primary liver cell carcinoma (PLCC) that makes HBV infection to continue to remain a public health concern (Amazigo and Chime. 1990; Archampong, 1979). Therefore we evaluated the seroprevalence of hepatitis B virus among blood donors.

Materials and Methods

The study was conducted in the blood bank of a tertiary care teaching hospital in the northern part of Karnataka. The study was done between June 2012 and May 2014. A total of 2500 were taken for the study. Out of 2500 samples 1780 (71.2%) were males & 720 (28.8%) were females. All the blood donors, donating blood in the blood bank were considered as the study population. The family members, friends or relatives of the patients were categorized as replacement donors. People who donate blood without expecting any favor in return or in voluntary blood donation camps were classified as voluntary blood donors. 2057 were replacement donors (82.2%) & 443 were voluntary blood donors (17.8%) (Table 1). The participant donors were from both urban and rural areas of the district. They were carefully selected for donation by trained personnel after a complete physical examination and satisfactorily answering the donor's questionnaire. Persons belonging to high risk groups such as patients from thalassemia clinics, sexually transmitted diseases clinics, professional blood donors, drug abusers, dialysis patients, sex workers, pregnant women, etc. were excluded from the study.

The samples were obtained for serological testing. HbsAg screening was done using rapid test kit based on the principle of a one-step immunoassay (Hepacard, Biomed Industries, India). All reactive samples were tested again using the commercially available Erba Lisa ELISA kit (Transasia Bio-Medicals Ltd, Daman) with reported sensitivity of 100% and specificity of 99.9% per the manufacturer's manual. Samples showing repeat test reactivity on both methods were considered positive and were included for calculation of seroprevalence.

Results and Discussion

A total of 2500 samples were screened, out of which 62 (2.48%) samples were positive for HBsAg. Replacement donors showed more seropositivity 2.69% than the voluntary donors 1.94% (Table 2). A higher seroprevalence rate was observed among male donors than in female blood donors (0.73% versus 0.27% respectively). The majority of the seropositive donors were younger than 35 years of age.

According to India's Drugs and Cosmetics Act (1945), each blood unit has to be tested for hepatitis B virus infection (Drugs and Cosmetics Act 1940). Infection with HBV is a worldwide significant problem in public health. About 5% (300 millions), of world population has chronic infection HBV, which is major factor for developing of chronic liver cirrhosis and hepatocellular carcinoma (Dienstag *et al.*, 1999; Mailliard and Gollan, 2003).

Among the 2500 screened samples, 62 of them (2.48%) were found positive for HBsAg. Similar type of results was found in an Indian study during the year 2008 (Nilima *et al.*, 2010). In contrast, seropositivity in another study was observed to be as low as 1.55% in 1996 and 0.99% in

2002 (Sharma *et al.*, 2004). A community cluster survey on STD prevalence conducted in Tamil Nadu showed an HBsAg prevalence rate of about 5.7% (Kurien *et al.*, 2005).

The prevalence of HBsAg among the replacement donors was found to be 2.45% in the study conducted in the blood bank, Department of Pathology, MIMS Medical College, Nellimarla, Vizianagaram (Gulia *et al.*, 2011), which correlates with the current study with prevalence rate of 2.69%. The prevalence of HBsAg was significantly high in the first time donors when compared to that of the repeated donors. These results are in agreement with the previous study

conducted among blood donors at Gondar University Teaching Hospital, Northwest Ethiopia between January 2003 and December 2007 (Tessema *et al.*, 2010). The increased seroprevalence among the first time donors might be due to the fact that people who regularly donate blood were frequently subjected to screening many times. HBV infection was found to be 1.94% in the voluntary donors studied. In contrast, a study conducted in voluntary blood donors in Yola, Nigeria had showed a higher prevalence of 2.4% (Olokoba *et al.*, 2009) and another study indicated that the prevalence of 2.2% was seen in the Pakistani donors (Bhatti *et al.*, 2007).

Table.1 Distribution of donors in different sexes

Type of donor	Male	Female	
Replacement donors	1402	378	1780
Voluntary donors	568	152	720
Total	1970	530	2500

Table.2 Distribution of HBsAg positive cases

Type of donor	No of donors	HBsAg positive cases	Percentage
Replacement donors	1780	48	2.69%
Voluntary donors	720	14	1.94%

In conclusion, reduction in seroprevalence among voluntary donors requires an effective donor education and high quality selection programme especially during big blood donation camps. Along with advanced technology for donor screening and other factors such as public awareness, educational and motivational programs, and mass immunization programs help in decreasing the infection. Pre-donation counseling, donor self-exclusion and ensuring 100% voluntary blood donation will be effective in decreasing the hepatitis B infection rate.

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