JOURNAL OF PURE AND APPLIED MICROBIOLOGY, October 2012. Vol. **6**(Spl. Edn.), p. 117-120

Seroprevalence of Hepatitis B Infection in Blood Donors in Western Uttar Pradesh- An Alarming Trend with 5 year Experience

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(Received: 04 March 2012; accepted: 10 June 2012)

According to WHO, safe blood is a universal right, which means that blood that will not cause any harm to the recipient and that has been fully screened and is not contaminated by any blood-borne disease such as HIV, hepatitis, malaria, or syphilis. Hepatitis B is one of the most common diseases transmitted by blood and individuals with chronic infection have a high risk of developing liver cirrhosis and hepatocellular carcinoma. The current study looks at the sero-prevalence of Hepatitis B infection amongst healthy blood donors coming to Blood Bank, J N Medical College Hospital, AMU, Aligarh during the period 2006-2010. All blood donations (voluntary or replacement) collected over this period were included. Collected samples were screened for hepatitis B surface antigen (HBsAg; Hepalisa, J. Mitra) and Enzyme linked immunosorbent assay (ELISA), to determine the seropositivity of infection in the donors. Of the 53422 units of blood collected over a 5- year period, 24040 (45%) were from voluntary and 29382 (55%) from replacement donors. Among the donors, 1636(3.1%) were positive for Hepatitis B, of which 1546(94.5%) were males and 90 (5.5%) were female donors. The seroprevalence of HBsAg was relatively high (3.1%) in our study when compared to the reported rates in other parts of country and only 5.5% females were positive for HBsAg as compared to 94.5% of males. Safety of the blood supply is dependent on collecting blood from voluntary donors from low-risk populations, screening donated blood for transmissible infections and avoiding unnecessary transfusions. These activities need to be carried out by a well-coordinated blood transfusion service with quality control being implemented at all levels and efforts should be made to increase the number of voluntary donors and reduce replacement donations to a minimum.

Key words: Blood donors, Hepatitis B infection, Seroprevalence.

Blood transfusion is a life-saving intervention and millions of lives are saved each year globally through this procedure.[1] However, blood transfusions are associated with certain risks which can lead to adverse consequences. It may cause acute or delayed complications and carries the risk of the transmission of infections.[2] Globally, more than 81 million units of blood are donated each year.[3] According to World Health Organization (WHO), in the year of 2006 only 38 countries were collecting more than 75% of their blood supplies from families, the rest obtained it from professional blood donors on payment.[3]

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malaria, or syphilis.[4] WHO recommends that, at least, all donated blood should be screened for Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human immunodeficiency virus (HIV), and syphilis.[3] The prevalence of the transfusion transmitted infections (TTIs), among blood donors allows for assessment of epidemiology of these infections in the community.[5] The acquisition of the infections in the healthy blood donor population can be a serious threat to safety of the collected blood donations and unsafe blood remains a major threat for the global spread of transfusion transmissible infections (TTIs).

Hepatitis B is one of the most common diseases transmitted by blood and individuals. There are wide variation in social, economic and health factors in different regions of India, which explain the difference in HBV infection different part of country. Professional blood donors constitute the major high risk of group for HBV in India. Blood transfusion represents the most important route of HBV transmission in adults. Individuals with chronic infection have a high risk of developing liver cirrhosis and hepatocellular carcinoma. Hepatitis B is a major public health problem in India and will continue to be, until appropriate nationwide vaccination programmes and other controls established. We at the Blood Bank of Jawaharlal Nehru Medical college Hospital, AMU, Aligarh studied the seroprevalence of hepatitis B infection in replacement and voluntary donors from the period 2006-2010.

MATERIALS AND METHODS

The present study was conducted in replacement and voluntary donors attending the Blood Bank of Jawaharlal Nehru Medical College Hospital, AMU, Aligarh from January 2006 to December 2010. All the donors were declared fit to donate after thorough clinical history and examination. Thereafter 5-10 ml of blood was withdrawn with a 10 ml disposable syringe and subjected to screening for detection of hepatitis B surface antigen (HBsAg) by Hepalisa-J Mitra), to determine the seropositivity of infection in the donors.

RESULTS

Majority of the donors were young males in the age group of 30-40 years (60%), followed by 30% donors in the age group of 21-30 years.

Of the 53422 units of blood collected over a 5- year period, 24040 (45%) were from voluntary and 29382 (55%) from replacement donors (Table 1). Among the donors, 1636(3.1%) were positive for Hepatitis B, of which 1546(94.5%) were males and 91(5.5%) were female donors(Table 2).

Our study showed an increasing trend in the seroprevalence of HBV infection from 2006 onwards with 216 positive cases(2.2%) in 2006 which increased to 530 positive cases(4.0%) in 2010.(Table 3) The prevalence is low among the female donors which may be due to fewer number of female donations. The seroprevalence of HBsAg was relatively high (3.1%) in our study when

Table 1. Trends in voluntary and replacement blood donation

Year	Total No of Donations	Replacement Donation (%)	Voluntary Donation (%)
2006	9820	5401 (55.0%)	4419 (45.0%)
2007	9940	5467 (55.0%)	4473 (45.0%)
2008	10084	5647 (55.9%)	4437 (44.1%)
2009	10300	5665 (55.0%)	4635 (45.0%)
2010	13278	7202 (54.2%)	6076 (45.8%)
Total	53422	29382(100%)	24040(100%)

Table 2. Gender distribution of blood donors

Gender	Prevalence of HBV	Percentage (%)
Males	1565	94.5%
Females	91	5.5%
Total	1656	100

Table 3. Yearly positivity and overall seroprevalence of HBV infection

Year	No. of samples	HBV positive cases	Percentage (%)
2006	9820	216	2.2%
2007	9940	298	3.0%
2008	10084	303	3.0%
2009	10300	309	3.0%
2010	13278	530	4.0%
Total	53422	1656	3.1%

compared to the reported rates in other parts of country.

DISCUSSION

Transfusion transmitted infections (TTIs) continue to be a threat to safe transfusion practices. With every unit of blood, there is a 1% chance of a transfusion associated problem including TTIs.[4] Professional donors and donors with high risk behaviour such as drug addicts, homosexuals and commercial sex workers constitute the major risk segment. In our study, voluntary donations were about 45% of the total. In northern India, the voluntary donor rates vary from 9.1% to 52.3%.[6,7] However, replacement donors still comprise a large proportion of blood donors.[6] Many studies have shown that replacement donors have higher seroreactivity rates than voluntary donors due to a number of factors including concealing high risk behaviour and paid donors posing as relatives.[6,7] However, studies from India show that this varies with the geographical region with rates of 9%–30% for HBV.[4,7,8]

In our study seroprevalance of HBsg was 3.1% , relatively high as compared to studies in other parts of the country.[8,9] A study in West Bengal on 7653 donors showed 227 (2.97%) cases positive for hepatitis B surface antigen (HBsAg).[10] A similar study reported the prevalence rate of HBV as 1.66% (1660 positive cases per 100000 donations)[4] whereas in Iranian blood donors these rates were 0.49% for HBV infection.[11] A study was conducted in blood donors in the United States from 1991 to 1996 to show the trends in incidence and prevalence of major transfusion transmissible viral infections, which highlighted that prevalence of TTIs has shown a downward trend with increased donor screening effectiveness.[12]

CONCLUSION

Safety of the blood supply is dependent on collecting blood from voluntary donors from low-risk populations, screening donated blood for transmissible infections and avoiding unnecessary transfusions. These activities need to be carried out by a well-coordinated blood transfusion service with quality control being implemented at all levels and efforts should be made to increase the number of voluntary donors and reduce replacement donations to a minimum. Though the most reliable method to diagnose occult HBV infection remains the detection of HBV DNA, it would not be practical yet to recommend this highly sensitive molecular assay for each and every patient in resource limited countries.

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