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ABSTRACT

Background: Availability of safe blood and blood products for transfusion is increasingly difficult globally, especially in developing countries because of high prevalence of Transfusion Transmissible Infections.

Objectives: To determine the prevalence of HBsAg among blood donors and to evaluate the socio-economic, demographic and medical factors associated with its infection.

Design: A prospective study.

Subjects: Three hundred and fifty consecutive blood donors were recruited. 2 ml of venous blood was collected aseptically from the ante-cubital vein and subjected to serological test for HBsAg.

Results: High prevalence rate 10.9% was recorded. All the donors reactive to HBsAg were males (38,100%) with a mean age of 30.7±8.02 years, while 55.3%, 44.7%, 5.3%, 42%, 47.4%, 5.3% of them were single, married, primary school graduate, secondary school graduate, tertiary school graduate and illiterate respectively with 36.8%, 23.7%, 39.5% and 0% been unemployed, civil servants/professionals, skilled artisans and business/petty traders. The most common risk factor was multiple sexual partners 55.3%, followed by extra marital affairs 13.2%, tattooing 10.5%, previous blood transfusion 5.2%, previous surgery 2.6% and sex trading 2.6%.

Conclusion: Active public enlightenment programmes and strict blood donation selection criteria need to be put in place in order to provide safe blood and blood products for transfusion.

INTRODUCTION

Transfusion Transmissible Infections (TTIs) are still major concerns in blood transfusion medicine in Nigeria and the world over making the practice of safe blood transfusion increasingly difficult. Hepatitis B virus is one of the serious infectious risks of blood transfusion all over the world and it is one of the most potent causes of viral Hepatitis, an acute inflammation of liver caused by Hepatitis viruses. Of all the hepatotropic viruses, hepatitis B is a major public health problem in developing countries (1) and worldwide. It is the most serious viral hepatitis, leading to liver cirrhosis and liver cancer in chronic consequences.

Globally, an estimated two billion people have

been infected with hepatitis B virus (HBV) (2), with the world carrier rate of about 350 million (3). Hepatitis B is hyper-endemic in sub-Saharan Africa and Asia (4,5). Infections with Hepatitis B virus have been associated with long-term morbidity and mortality due to complications like cirrhosis, portal hypertension, chronic liver diseases and hepatocellular carcinoma (6).

About one million people die annually from HBV related Chronic Liver Diseases (7). The virus is transmitted parenterally mainly through blood and blood products transfusions, sexual contact, injuries with contaminated sharp objects like needles, and blades, sharing of needles as with drug addicts and vertical transmission from mother to foetus (8).

The complete Hepatitis B virus, about 42 nm

in diameter, is a double stranded DNA spherical particle with a double shell. Hepatitis B surface antigen (HBsAg), Hepatitis B core antigen (HBcAg) and Hepatitis Be antigen (HBeAg) are the three forms of antigens associated with hepatitis B infection. The levels of all the three antigens rise during infection. HBsAg level remains high both in acute and chronic phases of hepatitis B virus infection.

Infection with HBV is diagnosed by the detection of HBsAg in the blood of the patient. Screening for TTIs including HBV in the donor(s) is done routinely in all blood banks to detect HBV infection. Any donor found reactive or positive to HBV and other TTIs are permanently deferred for blood donation.

The high prevalence rates of HBsAg quoted from some parts of this country among blood donors are still worrisome (9,10). A very wide prevalence range of 0.66-25% of HBsAg among blood donors have been reported from different parts of the world (11). In Nigeria, prevalence range is 6-8.4% (12-15).

Prevalence of HBV among blood donors in this centre and the entire north central zone of Nigeria has not been studied in the past five years. We therefore decided to study the prevalence and the risk factors of hepatitis B surface antigen among our blood donors in Ilorin.

MATERIALS AND METHODS

Three hundred and fifty (350) consecutive blood donors who consented to participate in this study

were recruited at the blood bank of the University of Ilorin Teaching Hospital. Hospital ethical approvals as well as informed consent from subjects were obtained before commencement of this study. The socio-demographic characteristics and information on risk factors of participants were collected using structured questionnaires specifically designed for this purpose.

Two millilitres of venous blood was collected aseptically from the ante-cubital vein of each subject and put in an EDTA bottle. The sample was centrifuged at 1500 revolutions/minutes and the serum collected into a plain bottle and stored at -20°C until analysed.

HBsAg testing was done using a one stage Hepatitis B surface antigen test strip, a qualitative lateral flow immuno-assay kit Grand Medical Diagnostic, USA according to manufacturer's instruction.

Data analysis: The mean, frequencies and standard deviation were analysed using SPSS version 2.0.

RESULTS

The overall prevalence of HBsAg among our blood donors was 10.9% (38 out of 350 blood donors). Table 1, Figures 1 and 2 summarise the demographic, socio-economic and risk factors in all the donors (38 HBsAg reactive and 312 HBsAg non reactive donors)

Table 1
Demographic Pattern, Socio-economic and Risk Factors for Hepatitis Amongst the HBsAg Reactive and Non reactive Donors

Demographic Pattern and Socio-economic Factors	HBsAg Reactive Donors N/%	HBsAg Non reactive Donors N/%	Risk Factors	HBsAg Reactive Donors N/%	HBsAg Non reactive Donors N/%
Total Number	38(10.9)	312(89.1)		38(10.9)	312(89.1)
Mean Age	30.76±8.02	31.41±8.33		30.76±8.02	31.41±8.33
Sex:			Tattooing	4(10.5)	30(9.6)
Male	38(100)	301(96.5)			
Female	0(0)	11(3.5)			
Marital Status:			Previous surgery	1(2.6)	12(3.8)
Single	21(55.3)	121(38.8)			
Married	17(44.7)	189(60.6)			
Widowed	0(0)	2(0.6)			
Educational Background:			Previous blood transfusion	2(5.2)	11(3.5)
Primary	2(5.3)	19(6.1)			

Secondary	16(42)	106(34)		
Tertiary	18(47.4)	167(53.5)		
Illiterate	2(5.3)	13(4.2)		
Others	0(0)	6(1.9)		
Nature of Job:			Multiple sexual partners>1	21(55.3) 42(13.5)
Unemployed	14(36.8)	102(32.7)		
Civil servants/ professional	9(23.7)	97(31.1)		
Skilled artisans	15(39.5)	73(23.4)		
Business/petty trading	0(0)	40(12.8)		
			Positivity to other TTIs	0(0) 18(5.8)
			Extra marital affairs	5(13.2) 100(32.1)
			Sex trading	1(2.6) 0(0)
			Homosexualism	0(0) 6(1.9)
			Oral sex	0(0) 6(1.9)
			Anal sex/STI	0(0)/ 0(0) 3(1.0)/2(0.6)

Figure 1
Demography of HBsAg reactive and non reactive donors

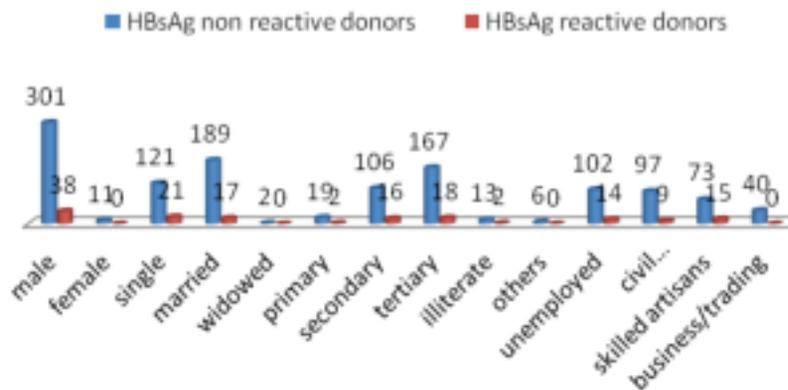
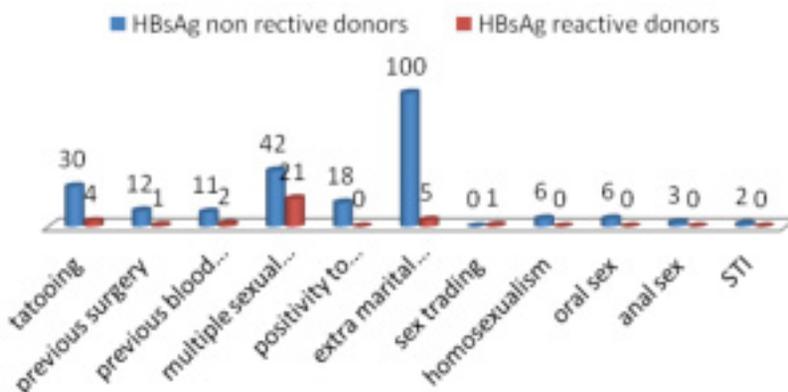


Figure 2
Risk factors for Hepatitis in HBsAg non reactive and reactive donors



Three hundred and fifty blood donors (339 males and 11 females) aged 31.41 ± 8.33 years (mean \pm SD) were recruited to the study. Thirty eight (10.9%) were reactive while 312 (89.1%) were non-reactive to HBsAg. All the donors reactive to HBsAg were males (38,100%) while 21 (55.3%), 17 (44.7%), 2 (5.3%), 16 (42%), 18 (47.4%) and 2 (5.3%) were single, married, primary school graduate, secondary school graduate, tertiary school graduate and illiterate respectively with 14(36.8%), 9 (23.7%), 15 (39.5% and 0 (0%) been unemployed, civil servants/professionals, skilled artisans and business/petty traders. Concerning the risk factors amongst the reactive donors, multiple sexual partners (>1) was the highest 21 (55.3%) followed by extra marital affairs 5 (13.2%), tattooing 4 (10.5%), previous blood transfusion 2 (5.2%), previous surgery 1 (2.6%) and sex trading 1 (2.6%). None of them was involved in homosexuality, oral sex, anal sex and sexually transmitted infections.

For the HBsAg non-reactive donors, 301 (96.5%) were males while 11 (3.5%) were females. One hundred and twenty one (38.8%), 189 (60.65%), 2 (0.6%), 19 (6.1%), 103 (34%), 167 (53.5%), 13 (4.25) and 6 (1.9%) were single, married, widowed, primary school graduates, secondary school graduates, tertiary institution graduates, illiterates and others with 102 (32.7%), 97 (31.1%), 73 (23.4%) and 40 (12.8%) were unemployed, civil servants/professionals, skilled artisans and business men/petty traders respectively. The risk factors amongst the non-reactive donors were 30 (9.6%), 12(3.85), 11 (3.5%), 42 (13.5%), 18 (5.8%), 100 (32.1%), 0 (0%), 6 (1.9%), 6 (1.9%), 3 (1.0%) and 2 (0.6%) for tattooing, previous surgery, previous blood transfusion, multiple sexual partners, positivity to other TTIs, extra marital affairs, sex trading, homosexuality, oral sex, anal sex and sexually transmitted infections.

DISCUSSION

A high seroprevalence rate of 10.9% was recorded in this study for HBsAg. This is in keeping with WHO report of Hepatitis B virus infection endemicity in this environment (16). The prevalence rate in this centre is similar to that found in other parts of the country, 10.6% in the South-South region of Nigeria (9) and 13.2% in Ibadan, south-west region of Nigeria (10). In some other parts of the country very low prevalence rate have been reported, 1.1% in the Niger Delta region (18), 1.2% in North-Easter region of Nigeria (19) and, 2.4% among voluntary blood donors in Yola (20). Outside Nigeria, the prevalence ranges from 2.2% among Pakistani blood donors (21) and 10% among Sudanese blood donors (17).

Prevalence of HBsAg among voluntary blood donors is lower than that among blood donors

generally. Most of the reported cases of lower prevalence quoted above were among voluntary blood donors.

The mean age of all the donors was 31.41 ± 8.33 years, and they are predominantly males. This is similar to the findings by other researchers (13,19). Majority of the blood donors were unemployed 116 (33.1%). The major risk factor among our donors found reactive to HBsAg was multiple sexual partners, which constituted the highest in the study, 21 (55.3%). This was followed by extra marital affairs 5 (13.2%), tattooing 4 (10.5%), previous blood transfusion 2 (5.2%), previous surgery 1 (2.6%) and history of sex trading 1 (2.6%). This is similar to the findings of other researchers. In a study among Egyptian blood donors, 50 and 4% of the positive cases had multiple sexual partners and history of blood transfusion respectively (22). In a similar study in Bangladesh HBV-seropositivity was found to be significantly associated with married status, history of jaundice, surgical operations, needle-stick injuries, visiting unregistered health-care providers, receiving treatment for sexually transmitted diseases, animal bites, ear-nose-body piercing in females, circumcision and visiting community barber for shaving in males (23).

Because of the high prevalence of HBsAg in this study, getting safe blood for transfusion will be difficult in this environment.

LIMITATION

The finding of high seroprevalence rate was based on the reactivity of the samples to Hepatitis B surface antigen rapid test strip used for the study. A confirmation of the infection is necessary with the use of Polymerase Chain Reaction, which is not available in our centre. It is possible that the real prevalence rate may not be as high as was found in the study.

RECOMMENDATION

Accurate donor selection and the decision to accept a blood donation is centred on the safety of the person donating the blood and the safety of the individual receiving the blood and its components (24).

Because of the findings of high prevalence of Hepatitis B virus reactivity amongst blood donors in this environment, the associated behaviour-, medically- and socio-economically- related risk factors, there is need for very strict blood donor selection criteria, like the one outlined by Australian Red Cross Blood Service (24), as well as the use of very specific and sensitive screening method for Hepatitis B in the donated blood units before transfusion. A continuous educational programme on the mode of

transmission and probably the effects of Hepatitis B virus is advised both for the public and also for all type of donors, even for those already in the Voluntary Non Remunerated Blood Donor (VNRBD) pool.

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