Nigerian journal of surgical Research
Vol 7 No 3 – 4 2005:290-292

Original Article

Safety of blood transfusion: prevalence of Hepatitis B surface antigen in blood donors in Zaria, Northern Nigeria

H.M Muktar , A.M Suleiman and M Jones

Blood Transfusion Unit, Department of Hematology and Blood Transfusion, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.
Request for Reprints to Dr HM Muktar Dept of Hematology and Blood Transfusion ABUTH, Zaria.
E-mail: hmuktar2000@yahoo.com

Abstract

Background:Hepatitis B infection has long been known to be common in the general population and due to its mode of transmission through blood transfusion; it had made provision of safe blood difficult especially in developing countries.
Method: A retrospective study aimed at reassessing the current of sero-prevalence of hepatitis B infection in blood donors in a typical developing country was conducted.
Results: Six thousand and twenty five regular blood were screened our of which 254 (4.2%) were HBsAg positive with lowest rates being in 2001 (3.5%) and the highest rates occurred in 2002(5.1%).Age of donors ranged from 19-42years with a mean 33 years, 98% were males while only 2% were females. Prevalence of HBsAg was 47.2% in patients' replacement donors, 44.5% in relations of antenatal clinic attendees and 8.3% in voluntary donors.
Conclusions:
This study has revealed a high prevalence rate of hepatitis B infections in all age groups and categories of blood donors in our setting which makes transfusion of unscreened hazardous.
Key Words: Regular blood donors; HBV; Prevalence.

Introduction

It is estimated that there are about 300 million chronic hepatitis B virus carriers world wide that are capable of transmitting the infection through blood transfusion , with annual mortality of about 2 million deaths[1]. Hepatitis B infection is common in Nigeria with about 15 million people infected, though regional variations occur[2,3]. Infection due to hepatitis B virus leads to gradual hepatocellular damage over a course of time if not arrested in good time. Long term infection has been found to be associated with liver cirrhosis, hepatocellular carcinoma and death due to liver failure[4].
Previous workers had determined the prevalence rates of hepatitis B surface antigenemia in blood donors in our setting, the last being 15 years ago[5].Since the last study there had been the discovery of hepatitis B vaccine and the institution of specific treatment against hepatitis B virus, this is expected to change the dynamics of the infections.

Transfusion of blood and blood products has assumed an important role in the management of a variety of diseases. Effective management of blood loss in severe trauma, major surgery and haemorrahages requires constant supply of safe blood.
The high burden of hepatitis B virus infections and the added effects of infections with other viruses transmitted via blood transfusion have highlighted the magnitude of the impact of these infections on our blood transfusion services. All these had impacted negatively on the available safe blood for transfusions.
This study was therefore undertaken to reassess the prevalence rate of HBsAg among blood donors 15 years after the previous study from this center.

Methodology

This is a retrospective study carried out over a five year period (June1999-May2003 at the Blood transfusion unit of Ahmadu Bello University Teaching Hospital (ABUTH) Zaria, Nigeria.
The subjects were regular blood donors to the Blood Transfusion unit of the hospital. Blood donors in this study comprised of patient replacement donors, voluntary donors and spouses of antenatal clinic attendees.
About 5 milliliters of venous blood was collected in an EDTA bottle. Determination of the hepatitis B sero status of the donors were carried out within 6 hours of blood sample collections and subjected to screening using latex agglutination kits by BIOTEC laboratories. All tests were run using positive and negative controls. Indeterminate tests were repeat tested. The latex agglutination test kit used has a sensitivity of 99.5% and a specificity of 99.5% according to information supplied by the manufacturer.
Results of the tests were analysed using the SSPS soft ware version 11
Results
A total of 6025 donors were screened for hepatitis B surface antigen. Age of the donors ranged from 19 to 42 years with a mean of 33 years +-5 SD (Table 1). Two hundred and fifty four (4.2%) of the donors were HBsAg positive. Age distribution of the HBsAg positive donors showed that 126(49.6%) occurred in the age group 30-34 years olds and the lowest occurred in the age group 40 years and above. Five thousand nine hundred and fifty nine (98.9%) were males while only sixty-six (1.1%) were females. Table 2 is the yearly distribution of the donors and the prevalence rates. The prevalence rate was highest in 2002 (5.1%) and lowest in 2001 (3.5%).Of the 254 blood donors that were HBsAg positive, 120 (47.2%) were patient replacement donors, 21(8.3%) were voluntary donors and 113(44.5%) were antenatal replacement donors (Table 3)

Table 1Age and HBsAg status

Age-group (yrs)	HBsAg+	HBsAg-	Total
15-19	23(2.3%)	959	982
20-24	21(2.2%)	926	947
25-29	32(2.8%)	1101	1138
30-34	126(3.2%)	1130	1256
35-39	38(4.2%)	873	911
40+	14(1.8%		
	254	5771	6025

Table 2 HBsAg Prevalence among blood donors

Year	No screened	No positive	%
1999	532	21	3.9
2000	829	33	4.0
2001	1459	51	3.5
2002	1665	85	5.1
2003	1540	64	4.1
TOTAL	6025	254	4.2

Discussion

In this study, 254(4.2%) donors were HBsAg positive. Age range of the donors showed a wide variation with in ages from 19-42 years. Approximately 99% of all the donors in the study were males while only 1% were females, this conformed to the community's expectations that adult males are to donate blood for the society. The study was able to establish hepatitis B infections in all age groups with the highest age-specific prevalence rate occurring in the age group 30-34 years representing approximately 50% of all infections. This group is the most active in the community and portends grave danger to the society; they must be kept free from transfusion transmissible viruses to ensure regular safe blood supply.
The 4.2% prevalence rates obtained in this study showed that hepatitis B infection is not only common in this environment but is equally very high and compares favorably with similar work done in this and other centers in Nigeria[6]. Similar work done by Kulkarni and co-workers on 1860 blood donors in this hospital in 1986, found a prevalence rate of 8.6%. The finding in that study was higher than the finding in this study with significant differences in frequency observed in different ethnic groups and blood groups. The differences in prevalence rates between this study and the earlier study could in part be attributed to differences in methodology and the lower sensitivity of latex agglutination. Additionally, since the last study institution of vaccines against the virus and specific treatment measures could have lowered the prevalence in our setting. The high prevalence of hepatitis B surface antigenaemia in our blood donors was not an isolated case as works done in various parts of Nigeria had confirmed the occurrences of the infection in endemic proportions[7,8,9].It should be noted that the sample population for this study consisted of voluntary donors, patients' relation (replacement) and antenatal replacement donors. Patient's replacement donors consisted of patients' relations who were on admission and required blood. Husbands of attendees to antenatal clinics are required by hospitals policy to deposit a pint of blood as a precondition for antenatal booking. This is in case the woman might require blood in the course of the pregnancy. The high prevalence of hepatitis B surface antigenaemia occurring in both patient and antenatal replacement donors is a serious cause for

concern as these provides almost 90% of our donors. Voluntary donors had the least prevalence of antigenaemia in the study and this was a reflection of low risk behaviours associated generally with this group, they should be encouraged to maintain low risk behaviours and donate blood regularly. This study showed a near absolute majority of all donors being males with an insignificant proportion of females. Interestingly, none of our female donors tested positive for Hepatitis B surface antigen but a prevalence study in pregnant men in 1986 found an 11% prevalence rate[10]. The high prevalence of Hepatitis B infections in our blood donor pool underscores the need to ensure active screening of all donors to protect the population in need of blood.

Acknowledgements
We wish to acknowledge with thanks contributions of the staff of the Department of Haematology and Blood Transfusions Ahmadu Bello University Teaching Hospital, ABUTH ZARIA and Professor M Durosimi of the Department of Haematology Obafemi Awolowo University Teaching Hospital (OAUTH) Ife.

References

1. Olusanya O, Williams B,Thomas CO,Adebayo JO.Prevalence of hepatitis B associated antigen in Ile-ife.Nig .Med.Practitioner 1982;4:164-7.
2. Strickland GT, Hepatitis C in developing countries.Post Doctor Africa 2002;24:26-8.
3. Olumide EA,The distribution of HbsAg inAfrica and the tropics:Report of a population study in Nigeria.Int J Epidemiol 1976;5:279-289.
4. Szumuness W.Hepatocellular carcinoma and hepatitis B virus :Evidence of causal association. Pro.med virol 1978;24:40
5. Kulkarni AG ,Aloowoja FO,Way GB.Prevalence of Hepatitis Bsurface an tigen in northern Nigerian blood donors.Vox sanguinis.1986;50:151-153.
6. Ejele OA,Ojule AC.The prevalence of Hepatitis B surface Antigen in Blood Donors and patients in Port Harcourt Nigeria.Nig J Med 2004;4:335-337.
7. 7. Baba MM,Hassan AW, Gashau W.Prevalence of Hepatitis B antigenemia and Human imunodeficiency Virus in Blood Donors in Maiduguri,Nigeria.Nig J Med 2000;9:10-12.
8. 8 Onaiya MO,Ebohon PA. Blood Transfusion Hazard in Benin city, Nigeria.Hepatitis B antigenemia. Nig med J 1992;12:251-254.
9. Durosimi MA,Ndububa OA,AlabaOA.Prevalence of HIV and Hepatitis B surface antigen in normal Blood Donors in Ile-ife.Nig Med J 1991;5:138-140.
10. 10 .Yakubu AM, Fakunle YM. Prevalence of hepatitis B surface antigen (HBsAg) in pregnancy and cord blood in Zaria, Nigeria. African Journal of Hospital Medicine 1986;8:49-50.