



## SERO-PREVALENCE OF HEPATITIS B SURFACE ANTIGEN (HBSAG) AMONG BLOOD DONORS ATTENDING AHMADU BELLO UNIVERSITY TEACHING HOSPITAL (ABUTH), ZARIA, NIGERIA

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### ABSTRACT

*A study on the sero-prevalence of Hepatitis B surface Antigen among 100 blood donors attending Ahmadu Bello University Teaching Hospital Shika, Zaria, Kaduna Nigeria was carried out in June, 2008 using hepatitis B surface Antigen latex. Higher prevalence rate was observed between the age range of 30 – 39years. No prevalence was observed between 15 – 19 and 45-54years. The findings revealed high prevalence in males as compared to females ( $p < 0.05$ ).*

*Key words: Prevalence, Hepatitis, Surface Antigen.*

### INTRODUCTION

Hepatitis B is an acute and common infection of liver in which the liver cells (i.e hepatocytes) are inflamed. It can be induced by both infectious and non infectious agents. The former include a variety of different viruses such as hepatitis A, B, C, D and E. The later includes an over active immune system, use of drugs, alcoholism, chemicals and environmental toxins (Deinstag *et al.*, 1995).

The infection is caused by Hepatitis B Virus (HBV), an enveloped virus containing a partial or incomplete double-stranded circular DNA genome. It belongs to the family hepadnaviridae. It is 42nm long and composed of 27nm nucleocapsid core surrounded by an outer lipoprotein coat containing the Hepatitis B surface antigen (HBsAg). The virus interferes with the liver function while replicating in the cytoplasm of hepatocytes (Seeger and Mason, 2000). HBV is present in body fluids of the infected person such as blood, serum, vaginal secretions and in saliva though in low concentrations (Lindsley *et al.*, 1990). Although surrounded by a host cell derived envelope, HBV is remarkably stable to organic solvents. It is also heat and pH – resistant (Holling *et al.*, 1995). Young children who become infected with HBV are most likely to develop chronic infection. About 90% of infants infected during the first year of life and 30% to 50% of children infected between 1 to 4years of age develop chronic infection (Taukan *et al.*, 1990).

In Nigeria, reports of serum carrier rate of the surface antigen of hepatitis B virus (HBsAg) showed that the infection is gradually increasing. From surveys conducted among blood donors in Lagos and Bauchi; the prevalence rate of HBsAg was 13.3% (Mahoney and Kane, 1999), while in Ibadan it was 13.7% (Ayoola and Adelaja, 1998).

A prevalence rate of 8.3% out of 120 samples of blood collected randomly from pregnant women attending antenatal clinic in Ahmadu Bello University Teaching hospital, Zaria, Kaduna State was obtained (Ibrahim, 2005).

Currently there are four recognized modes of transmission of HBV infection namely: mother to child

at birth (perinatal); Contact with infected person (horizontal); sexual contact (inter course) and parenteral (blood to blood) exposure to blood or other fluids (Lindsley *et al.*, 1990). Many people infected with hepatitis B virus never develop signs and symptoms. However in others, it is associated with loss of appetite, nausea and vomiting, weakness and fatigue, abdominal pain, especially around the liver, dark urine, yellowing of skin and the whiteness of eyes (jaundice), joint pain, mild fever, headache, muscle aches, diarrhea and dark coffee colored stools (Stewart and Beswick, 2005). The original assays for detection of hepatitis B virus infection involve serum or blood tests that detect either viral antigens or antibodies (Ryan and Ray, 2004).

There are no specific treatments for the acute symptoms of hepatitis B virus infection, but in most cases, bed rest, prevention of dehydration, balanced diet and avoidance of alcoholic beverages are recommended (Savel and Andelman, 2005). It can be prevented by avoiding contact with infected blood and body fluids, including semen and vaginal secretions of infected individuals (Lindsley *et al.*, 1990). The objective of this study is to investigate the risk spreading of hepatitis B virus among blood donors attending Ahmadu Bello University Teaching Hospital Zaria.

### MATERIALS AND METHODS

#### Sample Collection

The study was conducted at the Department of haematology/ immunology, Ahmadu Bello University Teaching Hospital, (ABUTH), Zaria. The randomly selected blood donors for this research were voluntary and commercial donors between the age range of 15 – 60 years, who patronize the hospital to donate blood to patients as relatives or otherwise. The vein puncture method of Julius and Schiff (2007) was employed to aseptically collect 2ml of blood samples each from 100 donors between the age ranges of 15 – 60 years, within two weeks.

The collected blood samples were centrifuged at 1500rpm for 5minutes to separate the serum from the blood.

**Serological Test**

The hepatitis B latex test method was employed using biotech® hepatitis B surface Antigen (HBsAg) kits 2/920, 2/922 and 2/924. With a disposable pipette stirrer, a drop of well shaken latex reagent was added to one drop (about 50µl) of the blood serum on the latex reagent and mixed well using separate disposable pipette stirrer. The preparation was rocked vigorously to homogenize. Agglutination of the latex in the circle within 5 minutes indicates positive test. The result obtained was subjected to Pearson Chi-square test.

**RESULTS**

The result of the distribution of Hepatitis B surface Antigen (HBSAg) based on age groups is presented in Table 1. The prevalence rate was highest in blood donors within the age 30-34 and 35-39 years with 26.7% each, followed by 20-24 and 25-29 years with 20% each. The least prevalence rate was recorded within the age range of 40-44 years with 6.6%. Apparently, the distribution of HBSAg was not noticed between 15-19, 45-49 and 50-54 years age ranges. The results of distribution of Hepatitis B surface Antigen (HBSAg) among sex groups is shown in Table 2. The males have the highest prevalence rate of 86.7% while the females have 13.3%.

**Table 1: Distribution of hepatitis B Surface Antigen (HBSAg) based on age groups among Blood donors.**

<i>Age – range (Yrs)</i>	<i>Positive</i>	<i>Cases</i>	<i>Prevalence Rate (%)</i>
15-19	0		0
20 – 24	3		20
25 – 29	3		20
30 – 34	4		26.7
35 – 39	4		26.7
40 – 44	1		6.6
45 – 49	0		0
50 – 54	0		0
<b>Grand Total</b>	<b>15</b>		<b>100</b>

**Table 2: Distribution of Hepatitis B Infection among sex Groups.**

<b>Sex</b>	<b>Positive Cases</b>	<b>Total Cases</b>	<b>Prevalence Rate (%)</b>
Male	13	91	86.7
Female	2	8	13.3
<b>Grand Total</b>	<b>15</b>	<b>99</b>	<b>100</b>

P< 0.05

**DISCUSSION**

The results obtained for Hepatitis B Surface Antigen will go a long way in providing useful information for diagnostic purposes and epidemiological studies of the infection. The highest prevalence rate of 86.7% recorded in males, furnished data for the localization of the infection. Related research by Ayoola and Adelaja (1998) obtained seropositivity of HBsAg of 15% out of 120 blood donor in Ibadan Nigeria. This might be connected with the involvement in sexual activity in adolescent age. More so, HBsAg Surface Antigen was observed among 20-29 and 30-39 years of age among blood donors. Studies have shown that, the likelihood of chronicity after acute HBV Surface Antigen, which may lead to hepatitis B viral infection varies as a function of age in both immunocompetent and immunocompromised host (Dienstag *et al.*, 1995). Furthermore, the prevalence of seropositivity could be associated with sexual activity and intravenous drug use among Nigerians in their third decade of life as well as a higher prevalence of HBsAg Surface Antigen among the younger age group compared to the older (Lwoff *et al.*, 2007) these buttressed the current result of the HBsAg Surface Antigen observed among the young age.

Further research on the incidence of HBsAg in Northern Nigerian blood donors revealed that 8.9% of 160 blood donors tested were positive (Tribedi, 1994). The current study revealed that HBV is prevalent in the community where many transfusions are carried out, (sometimes without carrying out the appropriate test). There is also a problem of window period, when the antigens or antibodies are not yet demonstrated, but yet the blood can still transmit the infection (David, 2007). More so, the result obtained conformed with the reports from community and hospital based studies in some parts of Nigeria, (Gombe, Ibadan, Lagos and Bauchi) as earlier reported by Harry *et al.*, (1994) who observed prevalence of HBsAg ranging from 7.4% -26%.

The distribution of hepatitis B Surface Antigen based on age range which showed no prevalence among the age ranges 15-19 and 45- 54years as well as high rate of surface Antigen at the age range of 30-34years will probably provide diagnostic information on the susceptibility of the ranges to the infection. This was attributed to the fact that, males are more often involved in donating blood than females. Omer (1995) opined that susceptibility to HBsAg may not be unconnected with intravenous drug use.

### **Conclusion**

It can be concluded that, the prevalence of HBsAg in the study site was higher in males within the age range of 30-39years.

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### **Recommendations**

Based on the findings of the current study, it is recommended that blood donors should always be screened for HBsAg. Biological specimens and body secretions should be handled aseptically. Further study should be made on the liver function tests to confirm HBV infection among the blood donors.