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## Study on Seroprevalence of Hepatitis B Virus on Blood Donors at State Hospital, Ijaye, Abeokuta, Ogun State

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**Abstract:** *Viral hepatitis B has been classified as being a prevalent infection that is caused by the infection of hepatitis B virus (HBV), resulting in acute and chronic liver diseases globally. The World Health Organization (WHO) reported that the number of people exposed to the Hepatitis B virus is about 2 billion global population and two hundred and forty million of the world population are chronic carriers. This work is on screening of blood for possible hepatitis B infection among the donors at State Hospital, Ijaye, Abeokuta, Ogun State, to determine the prevalence of such cases. The study was conducted from August 2021 through January 2022 at State Hospital, Ijaye, Abeokuta, Ogun State, South-west Nigeria. Two hundred (200) adults that were voluntary blood donors in the age range of 20 to 50 years old were selected for the study. And, two millilitres of blood samples were collected from each donor using vacutainer tubes and allowed to clot at 25 °C. A 50 µl serum of each blood sample was then pipetted from the vacutainer tube for analysis using the Lab ACON HBsAg Test strip. Positive samples to the HBsAg Test strip were further tested, using the primary confirmatory test: Chemiluminescence Immunoassay (CLIA) using the ARCHITECT HBsAg Qualitative Confirmatory assay. Twenty-seven samples originally tested positive for HBsAg, and twenty-two were confirmed HBsAg-positive using Chemiluminescence Immunoassay (CLIA), giving an overall prevalence of 11%, this being considered greater than the threshold of 7 % rated as HBsAg in an adult population, the study sample indicated an endemic population.*

**Keywords:** *Blood, Cirrhosis, Hepatitis, Immunoassay and Virus.*

### 1. INTRODUCTION

Viral hepatitis B has been classified as being a prevalent infection that is caused by the infection of hepatitis B virus (HBV), resulting in acute and chronic liver diseases globally. The World



Health Organization (WHO) reported that the number of people exposed to the Hepatitis B virus is about 2 billion global population and two hundred and forty million of the world population are chronic carriers [1]. Hepatitis B is notably spread from mother to child at birth or transmitted through contact with infected blood, in the case, of an infected child to a healthy child in the early years of life. Chronic infection is common among infants being infected by their mothers and/or being infected before the age of 5 years [2]. More so, an estimate of more than 292 million people is living with chronic hepatitis B (CHB) infection [3].

Africa is roughly estimated to be 60 million people living with chronic Hepatitis virus B infection and prevalence of about 6.2% [4]. Hepatitis B virus is 50 folds to 100 folds more infectious than HIV and 10 folds more infectious than hepatitis C virus (HCV) and carriers are asymptomatic of the virus infection [5]. WHO (2013) reported that 5–15% of adults in sub-Saharan Africa are chronically infected with the Hepatitis B virus [6]. The indication of the symptoms of Hepatitis B virus disease ranges from subclinical hepatitis to jaundice, hyperacute, acute and subacute hepatitis during the primo-infection phase and as an asymptomatic carrier state to chronic hepatic cirrhosis, hepatocellular carcinoma when in chronic phase. In the acute phase, the incubation period is 1-6 months [7].

According to Olokoba et al., 2009, about six hundred repeatedly invited voluntary blood donors in Yola, Nigeria that were screened for hepatitis B and hepatitis C virus infections, it is only 14 donors (male) each (2.4%) were positive for Hepatitis B Antigen and anti-hepatitis C Virus (HBsAg). [8]. Nigeria has been reported as being highly endemic for Hepatitis B Virus infection, and 75% of its population has probably been exposed to the virus once or other times in their lives [9]. Previous investigation of hepatitis B virus seropositivity among three hundred voluntary blood donors at a centralized blood service center in Nigeria by [10], revealed that Thirty-three (13.8%) of first-time donors were positive for hepatitis B markers and repeat donors were seronegative.

Salawu and co reported the presence of other Hepatitis B Virus markers in HBsAg negative blood donors and advised routine testing of markers such as antibodies to hepatitis B core (HBC) antigen in donor blood before transfusion [11]. The promulgation of law for the donation and management of blood in blood banks across the globe has vigorously curtailed the routes of Hepatitis B Virus transmission. Hence, this work is on screening of blood for possible hepatitis B infection among the donors at State Hospital, Ijaye, Abeokuta, Ogun State, to determine the prevalence of such cases.

## **2. METHODS**

### **A. Study area**

The study was conducted from August 2021 to January 2022 at State Hospital, Ijaye, Abeokuta, Ogun State, South-west Nigeria. This hospital is a major donor blood source for many hospitals within the metropolis. It's on this basis that this study area was chosen for the study. Laboratory investigations were performed in the Virology laboratory at the blood transfusion section of the state hospital. Two hundred (200) adults that were voluntary blood donors in the age range of 20 to 50 years old were selected for the study.



**B. Sample collection and analysis**

Two ml of blood samples were collected from each donor using vacutainer tubes and allowed to clot at 25 °C. A 50 µl serum of each blood sample was then pipetted from the vacutainer tube for analysis using the Lab ACON HBsAg Test strip. Positive samples to the HBsAg Test strip were further tested, using the primary confirmatory test: Chemiluminescence Immunoassay (CLIA) using the ARCHITECT HBsAg Qualitative Confirmatory assay.

**3. RESULTS**

200 voluntary blood donors in the age of range 20 to 50 years at State Hospital, Ijaye, Abeokuta, Ogun State were invited into the study. Twenty-seven samples originally tested positive for HBsAg, and twenty-two were confirmed HBsAg-positive using Chemiluminescence Immunoassay (CLIA), giving an overall prevalence of 11%.

Table 1: The Demographic Presentation of the Study Participants.

Parameters	Number of examined	Percentage (%)
<b>Age</b>		
20-30years	108	54.0
31-40years	56	28.0
41-50years	36	18.0
<b>Total</b>	<b>200</b>	<b>100</b>
Male	168	84.0
Female	32	16.0
<b>Total</b>	<b>200</b>	<b>100</b>

Table 2: HBsAg Status among Blood Donors at Ijaye State Hospital, Abeokuta based on demographic presentation

Parameters Age	Number of examined female	HBsAg Status	
		Positive	Negative
20-30years	108	7 (3.5 %)	101 (50.5 %)
31-40years	56	11(5.5 %)	45 (22.5 %)
41-50years	36	4 (2 %)	32 (16 %)
<b>Total</b>	<b>(200)</b>	<b>22 (11%)</b>	<b>178 (89 %)</b>
<b>Sex</b>			
Male	168	19 (9.5 %)	149 (74.5 %)
Female	32	3 (1.5 %)	29(14.5 %)
<b>Total</b>	<b>(200)</b>	<b>22 (4.5 %)</b>	<b>178 (89 %)</b>

Table 3: Prevalence of HBsAg among Blood Donors at State Hospital, Ijaye, Abeokuta

Specimen	Number Examined	Number Positive	Number Negative
Serum	200	22 (11 %)	178 (89 %)



#### **4. DISCUSSION**

This study showed a higher prevalence (5.5 %) among the age group 31-40 years compared to 3.5 % found among the age group 20-30 years, 2 % among 41-50 years. A higher prevalence of 9.5 % was found among male blood donors at State Hospital, Ijaye, Abeokuta compare to their female counterparts 1.5 % (Table 2). The age at exposure to infection was considered as being an important determinant of the incidence of Hepatitis B Virus in one of the studies [12].

The disease is shown to affect people in all age brackets, though, recently conducted studies on Hepatitis B Virus infection is mostly reflected in young adults, acquired through unprotected sexual activity and/or injection of drug use [13].

The threshold of the high endemic prevalence of Hepatitis B Virus has been rated as HBsAg greater than 7% in an adult population, [14] so, a prevalence of 11 % as evaluated indicates that the study area is highly endemic for Hepatitis B Virus infection and a good reason for immediate attention.

#### **5. CONCLUSION**

The age group 31-40 years had the highest prevalence of hepatitis B virus according to the study. And, Hepatitis B virus among blood donors in the study area is endemic, the presence of this infection among the blood donors should be further monitored, to ensure clean and safe from infection(s) and more reliable blood for transfusion.

Measures such as more sensitive techniques, education, sensitization and vaccination must be carried out to ensure that people are well enlightened and protected from these infections.

#### **Conflict Of Interest**

We declare that we have no conflict of interest.

#### **6. ACKNOWLEDGMENT**

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