

## Sero-Epidemiology of Hepatitis B Surface Antigen among Intending Blood Donors in Ogbomoso, South West Nigeria

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**Abstract:** Hepatitis B virus (HBV) infection, a viral disease, is of great concern to health community due to its adverse effect on the liver of infected individual. This is a retrospective study that was designed to determine the prevalence of hepatitis B infection among intending blood donors in Ogbomoso. Paucity of data as regards prevalence of HBV among blood donors in Ogbomoso necessitated this study. A total number of two thousand three hundred and twenty nine (2329) blood donors were recruited within the period of two years (2012-2013) for this study. Out of eight hundred and fifty seven (857) prospective donors recruited in year 2012, ninety eight (98) were tested positive to HBsAg giving a prevalence rate of 11.4% while one hundred and sixty three (163) donors were tested positive. Among one thousand four hundred and seventy two (1472) prospective donors recruited in year 2013, one hundred and sixty three (163) were tested positive, giving a prevalence rate of 11.1%. Prevalence rate in respect to age group was found to be higher in age group 28-37 in both years, and in term of sex, males have higher prevalence rate than females. The prevalence of 11.4% and 11.1% for HBV in both 2012 and 2013 respectively within the study population confirmed the high endemicity of the studied area.

**Keywords:** Blood donors, HBsAg, Ogbomoso, Seroepidemiology.

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### I. Introduction

Hepatitis B virus (HBV) is a double stranded DNA virus belonging to Hepadnaviridae family. Its major health significance is associated with gradual damage to the liver cells thereby reducing the functional capacity of liver [1]. Studies so far have shown that about two billion people have been infected with HBV and three hundred and fifty million are HBV carriers in the world [2].

Drostter et al. 2004 and Mc Mahon 2008 reported that, almost a million people die of HBV associated liver diseases yearly [3,4]. The prevalence of chronic hepatitis B infection vary from one continent to another with Africa and Asia continent having higher prevalence rate of 8.0% while Southern and Eastern Europe have intermediate prevalence rate of 2-7%. Western Europe, North America and Australia have low prevalence rate of 2.0% [5]. Report from Emechebe et al. shows that Hepatitis B virus prevalence rate in Nigeria ranges from 9-39%, and a prevalence rate above 7% in a study population is classified as hyper endemic [6].

Hepatitis B is highly contagious disease. Transfusion of infected blood or blood products, unprotected sex, and perinatal transmission during delivery from infected mother are major modes of transmission of HBV. Detection of Hepatitis B Surface Antigen (HBsAg) in Serum is indicative of either acute or chronic phase of HBV infection [7]. This study was aimed at determining the prevalence of hepatitis B infection among intending blood donors in Ogbomoso.

### II. Materials And Methods

#### 2.1 Study Population

The Study was performed in Ogbomoso, Oyo State, situated in the tropical belt of Southwestern part of Nigeria. The study participants were potential blood donors visiting State Hospital, Ogbomoso, Oyo State between 2012 and 2013. A total number of two thousand three hundred and twenty nine (2329) blood donors who consented to participate were recruited for this study.

#### 2.2 Laboratory Analysis

Blood samples collected from consented blood donors were analyzed for HBsAg using one step Hepatitis B surface antigen test strip manufactured by Global International Diagnostics Ltd. The test kit is a qualitative, lateral flow immunoassay for detection of HBsAg. The screening was carried out according to the manufacturer's instructions. The interpretation of test results was performed according to the manufacturer's specification.

### 2.3 Statistical Analysis

Frequencies, means and the percentages were generated using the Statistical Package for the Social Sciences version 18.0 (SPSS Inc, Chicago, IL, USA).

### III. Results

Out of a total number of eight hundred and fifty seven (857) intending donors recruited for this study in year 2012, ninety eight (98) were tested positive to HBsAg indicating a prevalence of 11.4% (TABLE 1). In term of sex-related prevalence, males have higher prevalence (12%) compared to females of 9.3% (TABLE 1). TABLE 2 showed the highest prevalence rate among blood donors in age group 28-37yrs (13.8%) then, group 38-47yrs (10.7%) and age group 18-27yrs (10.4%).

Of the one thousand four hundred and seventy two (1472) prospective donors recruited in year 2013, one hundred and sixty three (163) intending donors were seropositive to HBsAg representing a prevalence rate of 11.1%. Also, males have higher prevalence rate of 11.4% compare to females with 9.2% (TABLE 3). The highest prevalence rate among blood donors in respect to age group was observed in age group 28-37yrs (12.7%) follow by age group 18-27yrs (11.4%) and age group 38-47yrs (8.9%) (TABLE 4).

**Table 1. Sex distribution of Hepatitis B surface antigen among prospective blood donors in 2012**

Sex	No. Screened	No. Positive	% Positive
Male	717	85	12.0
Female	140	13	9.3
Total	857	98	11.4

**Table 2. Age distribution of Hepatitis B surface antigen among prospective blood donors in 2012**

Age (yrs)	No. Screened	No. Positive	% Positive
18-27	347	36	10.4
28-37	320	44	13.8
38-47	122	13	10.7
48-65	68	05	7.4
Total	857	98	11.4

**Table 3. Sex distribution of Hepatitis B surface antigen among prospective blood donors in 2013**

Sex	No. Screened	No. Positive	% Positive
Male	1232	141	11.4
Female	240	22	9.2
Total	1472	163	11.1

**Table 4. Age distribution of Hepatitis B surface antigen among prospective blood donors in 2013**

Age (yrs)	No. Screened	No. Positive	% Positive
18-27	570	65	11.4
28-37	560	71	12.7
38-47	270	24	8.9
48-65	72	03	4.2
Total	1472	163	11.1

### IV. Discussion

Hepatitis B infection is of great public health importance. It is responsible for about 500,000 to 1.2 million death yearly. The long term effects of hepatitis B infection are cirrhosis and hepatocellular carcinoma [8]. Several studies have recorded differences in prevalence of hepatitis B infection in different parts of Nigeria. Prevalence rate of 23.9% was recorded in Jos among blood donors by Uneke et al. [9]. Otegbayo et al. recorded 21.3% in Ibadan among blood donors [10]. Nwankwo et al. recorded 11.1% in kano among blood donors [11]. Prevalence rate of 13.3% was documented in Keffi among healthy individuals and 25% in Lagos among surgeons [12,13].

This present study recorded prevalence rate of 11.4% and 11.1% for hepatitis B infection among blood donors in Ogbomoso in year 2012 and 2013 respectively. The prevalence reported in this study is lower than 18.6% reported by Buseri et al. among blood donors in Osogbo, and higher than the 7.4% prevalence reported by S hittu et al. among intending blood donors in Akure [14,15]. The overall prevalence in both years was not significantly different and seems to be constant. According to the World Health Organization (WHO), study area/population with Hepatitis B prevalence rate of 8% or greater is classified as being endemic [2]. Considering the WHO remark, Ogbomoso is one of the highly endemic region for hepatitis B infection in Nigeria.

Analysis of sex-related prevalence rate of hepatitis B infection showed that males were more infected with HBV than females with average prevalence rate of 11.6% and 9.2% respectively. This observation is in agreement with previous study by Adekeye et al. who reported 15.9% and 4.9% prevalence rate of hepatitis B infection in men and women respectively [16].

The ratio of male to female with HBsAg in this present study were 6.5 and 6.4 in year 2012 and 2013 respectively. This suggested that the pattern of infectivity with HBV in respect to sex is constant with male having ratio of approximately seven to one female. Factor responsible for this pattern of infectivity with HBV in respect to sex is not understood. A Study conducted by UNSN (2001) revealed that multiple partnership and promiscuity are habits common in male than female. This finding may be responsible for the observed pattern of infectivity with HBV [17].

Prevalence of hepatitis B infection within age groups was found to be higher in age group 18-27yrs, 28-37yrs and 38-47yrs in both years. Highest prevalence was found in age group 28-37yrs in both years. Blood donors within the age groups stated above are more sexually active and this may be responsible for the high prevalence rate.

The average prevalence rate of 11.3% in this study area is alarming; hence there is need to strengthen the preventive strategies. Holistic screening of every prospective donor for hepatitis B virus is pertinent in order to prevent transmission of this virus via blood transfusion practice.

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