

## Seroprevalence of Hepatitis B Infection among out Patients Attending a Public Tertiary Hospital in Kaduna State, Nigeria

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### Abstract

A survey was conducted amongst 100 randomly selected out-patients attending a Public tertiary Hospital in Kaduna State, Nigeria, in order to ascertain the prevalence of Hepatitis B infection and the general knowledge of people about this highly infectious disease. Sera collected were tested for the presence of Hepatitis B surface antigen (HBsAg) using Wondfo Diagnostic rapid test Kit (China). Questionnaires were also distributed to the subjects in order to ascertain their perception about the disease, and to obtain useful socio demographic information. Chi square test was used to ascertain statistical associations between important characteristics in the study population. A total of 12 out of hundred patients tested positive to HBsAg, giving a prevalence of 12%. There was significant association ( $p < 0.01$ ) between seropositivity/blood donation, and also between seropositivity/hepatitis B immunization ( $p < 0.05$ ). There was generally a poor knowledge about HBV infection in the study population.

**Keywords:** Hepatitis B virus; Hepatitis B surface antigen; Seroprevalence; Kaduna; Nigeria

### Introduction

Hepatitis B virus (HBV) is a double stranded circular DNA virus, belonging to the family hepadnaviridae [1]. HBV has a complex structure and can cause one of the most infectious diseases of the world, resulting in fatal, chronic liver diseases [2]. HBV is easily transmitted to non-immune persons, via contact with infected blood or body fluids such as saliva, hence it could be acquired through blood transfusion with infected blood, intimate sexual contact; particularly during unprotected sex, sharing of contaminated sharp objects such as needles, and close personal contact in over-crowded households. It could also be transmitted from an infected mother to her un-born child through the placenta. Studies have shown that HBV is capable of producing viral particles having a complex surface antigen termed Hepatitis B surface antigen (HBsAg), widely circulated in the blood of infected persons. This has made it possible for immunological diagnosis involving antigen detection in infective sera. Hepatitis B infection, being a public health concern, is said to be more prevalent in developing countries, of which Nigeria is also inclusive. Over two billion people are said to be infected with HBV in the world, with about 280 million of such cases harbouring the virus in their liver as chronic carriers [3]. Chronic hepatitis is characterized by the presence of HBsAg in the blood for a period above six months. Although chronic hepatitis B carriers may remain asymptomatic as the infection remains inactive, this could actually progress to liver fibrosis, cirrhosis and hepatocellular carcinoma (HCC). Yang et al., reported that cirrhosis is present in majority of hepatitis B patients and chronic viral hepatitis is said to play a major role in activating liver fibrosis [4,5]. HCC is reported to be the "third leading cause of cancer-related death in the world", with about 78% of HCC being attributed to viral hepatitis of which HBV is inclusive [4]. In recent times, HBV infection

has drawn a lot of interest among Nigerians, and this is evident in the churn out of prevalence figures from various surveys in different parts of the country. In line with this, increase in awareness of the disease, and subsequent decline in prevalence is anticipated among Nigerians; however, increased knowledge may not necessarily translate to a decline in HBV prevalence. Therefore, despite the availability of information on HBV prevalence in Nigeria, prevalence studies are still important in order to inform concerned health authorities on evaluation of existing intervention strategies, and strategizing of newer effective prevention and control policies. The long-term health complications of chronic hepatitis B as outlined above, is an indication of the importance of continuous monitoring of hepatitis B prevalence over time in endemic areas. This study was therefore conducted amongst apparently healthy, asymptomatic, general out-patients attending a tertiary hospital in Kaduna metropolis, to determine HBV prevalence and ascertain their perception about HBV, its transmission, prevention and control.

### Materials and Methods

#### Study area and population

The study was conducted at both the General Out-Patient Department of a tertiary Public Hospital in Kaduna State, Nigeria where samples were collected and Department of Microbiology, Ahmadu Bello University, Zaria, Kaduna, Nigeria, where the Laboratory work was done. Ethical clearance was granted by the Hospital in conjunction with the Department of Microbiology, Ahmadu Bello University, Zaria, Kaduna State, Nigeria.

#### Questionnaire administration

Structured questionnaires were used to obtain sociodemographic data and relevant information on HBV awareness of the respondents.

Prior to questionnaire distribution, participants were well informed about the study and its relevance, and their consent to participate in the study was sought. Consent forms were signed and then, samples were collected. Data generated were analysed using SPSS, 2010 package. Chi square analysis was used to show associations between variables in the study population. Likert's scale was used to rate the knowledge of HB infection in the study population.

### Sample collection and processing

One hundred participants were selected randomly by balloting. Three millilitres of blood samples were collected intravenously from the selected persons, using a 5 ml syringe, and immediately transferred to plain blood bottles. Serum was separated by centrifuging at 1000 rpm for 5 minutes and screened for HBsAg using a one-step Wondfo Diagnostic test strip (Guangzhou Wondfo Biotech co. Ltd, China). The test strip was dipped into each tube containing serum for 10 minutes, before checking for and interpreting results. Positive results were indicated by the presence of visible bands in both the control and the test regions, while the presence of visible red coloured bands at only the control region, indicated a negative result.

### Results

Twelve out of one hundred persons screened for HBsAg tested positive, giving a seroprevalence of 12%. The bivariate analysis done indicated no statistically significant association between seropositivity and age/gender, however, prevalence rate appeared higher in females than in males (Table 1).

Sociodemographic factors	Number screened (n=100)	Prevalence (%)
<b>Age (years)</b>		
16-24	30	4 (13.3)
25-34	49	7 (14.0)
35-44	11	1 (9.1)
45 and above	10	0
<b>Gender</b>		
Male	64	5 (7.8)
Female	36	7 (19.4)
<b>Marital status</b>		
Married	31	3 (9.7)
Single	69	9 (13)

**Table 1:** Prevalence of HBV infection in relation to some socio-demographic factors in the study population.

Similarly, the prevalence (14%) appeared to be highest in the age group 25-34years, followed by 13% prevalence in age group 16-24 years (Table 1). There was no prevalence of HBV recorded for age group 45 years and above. There seemed to be a higher prevalence of the disease among single than married people (Table 1). Based on the Likert's scale used to assess the knowledge of HBV infection, 8% had a very good knowledge of HBV disease and its associated risk factors,

60% had a fair knowledge, while the remaining 32% were not well informed about the disease, hence exhibiting a poor knowledge of the disease. There was no HBV infection reported among persons with very good knowledge of the disease, however, 11.7 and 15.7% HBV prevalence was reported among persons with fair and poor HBV knowledge respectively. There was no statistically significant association between knowledge of HBV infection and seropositivity (Table 2). Twenty (20) percent of the respondents affirmed taking HBV immunization prior to this study, of which none tested positive to HbsAg (Table 2).

Factors	Number screened (n=100)	Prevalence (%)	P value (Chi square)
<b>Knowledge of HBV and transmission prevention</b>			p<0.05
Very Good	8	0	
Fair	60	7 (11.7)	
Poor	32	5 (15.7)	
<b>Screened for HBV before the study</b>			p>0.05
Yes	13	1 (7.7)	
No	87	11 (12.7)	
<b>Ever received HBV immunization</b>			p<0.05
Yes	20	0	
No	80	12 (15.0)	
<b>Ever donated blood</b>			p<0.01
Yes	29	2 (6.9%)	
No	71	10 (14.1)	
<b>Ever had blood transfusion</b>			p>0.05
Yes	6	0	
No	94	12 (12.8)	

**Table 2:** Prevalence of HBV infection in relation to knowledge and risk factors among study population.

Eighty seven percent (87%) of the respondents had never been screened for HB prior to this study, while the remaining 13% admitted that they had been screened for HB before this study. There were 2 positive cases observed among 29% of the study population which had participated in voluntary blood donation prior to this study. The remaining 10 positive cases reported in this study, were from 71% of the people who had never donated blood in their life time. Six percent of the study population had received blood transfusion at some point in their life-time, however, no HBV prevalence was reported among them. Ninety four percent (94%) of the study population had never received blood transfusion prior to the study, of which 12 tested positive to HBsAg, giving a prevalence of 12.8%. There was a statistically significant association (p<0.01) between blood donation

and seropositivity, and between seropositivity and HB immunization ( $p < 0.05$ ).

## Discussion

This survey has revealed 12% prevalence of HBV infection among randomly selected general out patients attending a hospital in Kaduna State, Nigeria, thereby indicating the occurrence of HBV among unsuspecting individuals. The prevalence reported here is higher than 8.3% prevalence reported in a previous study conducted by Luka et al., at Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State. The prevalence of 12% reported in this study is also higher than, 7.6%, 9.3% and 3.9% prevalence reported by Chukwuka et al., Ezegebudo et al. and Ugwuja et al. in Nnewi, Awka and Abakiliki, Nigeria respectively [6-9]. The HBV prevalence in this study corroborates the prevalence of 12.4% among children in a tertiary hospital in Niger Delta, Nigeria reported by Alikor and Erhabor [10]. A few studies in Nigeria have also reported higher prevalence of 15.8% in University of Maiduguri Teaching Hospital, Borno and 13.4% reported in Abakiliki by Idioha et al., [11,12]. This present study revealed a higher prevalence of HBV infection among the adolescents, and this could be attributed to their lifestyle and youthful exuberance, which increases their risk of exposure, such as sexual activities, sharing of contaminated sharp objects for fashionable expressions such as ear and nose piercings, etc. Such high prevalence among adolescents have also been reported in studies conducted by Eke et al., in Nnewi, Nigeria [13]. This study concurs with some of the studies conducted in Nigeria over time, which have shown no significant difference in the occurrence of HBV infection between males and females [3,14,15]. This therefore suggests, that gender is not a predisposing factor, but that both male and female are equally predisposed to HBV infection.

The lower HBV infection observed among married individuals could be attributed to the fact that married people may be more careful, particularly with regards to being faithful to their spouses and keeping away from having multiple sexual partners.

The absence of HBV infection among persons well informed about the disease could be as a result of the fact that, the knowledge acquired about prevention and control of the disease was translated into practice by this group of people. Likewise, persons with poor knowledge about HBV infection, transmission, prevention and control, had no prior knowledge and this probably increased their chances of exposure to the virus.

The low number of people going for voluntary screening for HBV only reiterates the rate of poor knowledge about HBV infection in the study population. Knowledge of one's status is key to adopting adequate measures which could avert disaster in the future. Immunization is regarded as the most effective control measure for HBV; the vaccine is said to be safe and effective in prevention of chronic carrier state development [16]. The statistically significant association between HB immunization and occurrence of HBV infection in this study corroborates the above statement, as none of the respondents who had been immunized prior to this survey had HBV infection.

Blood donation and transfusion are important risk factors of HBV infection. Although there was no HBV infection recorded among transfused respondents in this survey, in view of the recorded prevalence observed among blood donors in this survey, it can be said that transfusion with infected blood is risky. This is in agreement with studies by Multimer et al., Ali et al., and Sarwar et al., which rank

blood transfusion of blood products as the most common risk factor for HBV transmission [17-19]. In addition to this, a high reported prevalence or endemicity of HBV in a community is worrisome, because every individual is a potential blood donor, either voluntarily or involuntarily. These reasons may likely be responsible for the statistically significant association between blood donation and HBV seropositivity in the study population.

## Conclusion

Until recently, HBV infection has not been considered or viewed as a Nigerian problem. With recent studies of which this is inclusive, it is becoming clearer that HBV infection is endemic in Nigeria. This survey conducted among unsuspecting asymptomatic persons, reveals that HBV infection is prevalent in Kaduna State, recording a 12% prevalence. The knowledge about the virus and its mode of transmission, prevention and control was generally poorly perceived by the study population. Majority of the study population were unaware of their HBV status and a good percentage had not been vaccinated. The need for aggressive nation-wide HBV education and prevention/control campaign cannot be overemphasized, as this, along with mass immunization and adequate treatment of existing cases would be of use in reducing the spread and multiplication of the virus among individuals and in the society at large. There is also the need for further seroprevalence studies with proper monitoring to show successes of implemented intervention measures in Kaduna state and Nigeria at large.

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