Original Research Article

THE PREVALENCE OF HEPATITIS B VIRUS INFECTION AMONG PATIENTS ATTENDING DEFENCE HEADQUARTERS MEDICAL CENTRE, ASOKORO, ABUJA, NIGERIA

ABSTRACT

Hepatitis B infection is a global public health problem and is endemic in sub Saharan Africa. This disease has different modes of transmission and the infection is usually common in developing countries, including Nigeria. This study was carried out to determine the prevalence of HBsAg among patients attending Defence Headquarters Medical Centre, Asokoro, Abuja. The work was a random cross-sectional study that included 260 patients during the period of May to July 2020. A rapid diagnostic test kit was used for the screening for HBsAg. Out of the 260 patients tested, 10 were positive, giving a prevalence of 3.8%. The highest prevalence based on age was found among those aged 27 to 36 years with 2.28% seropositivity. The infection was highest among the low class of socioeconomic status with 5.21%. Patients who were not knowledgeable about the disease had a higher prevalence rate of 13.60% and lastly females had a higher prevalence rate of 4.55% compared to males (3.33). The prevalence of Hepatitis B infection is quite high in the studied population, which could have some public health implications. Recommendations have, therefore, been advanced to control and possibly eradicate the disease in no distant time.

Key Words: *Hepatitis B, Infection, Seroprevalence, Random cross-sectional study, Abuja*

1.0 INTRODUCTION

Hepatitis is a medical condition that is characterized by the inflammation of the liver, which results from the exposure to certain chemicals or autoimmune diseases. However, the infection is often caused by one of several viruses. The most common viral causes of hepatitis are five unrelated hepatotropic viruses (hepatitis A, B, C, D and E) which reside in the blood and other body fluid [1].

Of all the human hepatitis viruses, hepatitis B virus is the most virulent, versatile and most prevalent. HBV is present in the body fluid of infected individuals, such as urine, blood,

serum, semen, vaginal secretions, sweat glands and even saliva, though in low concentration. This virus is a widespread problem and epidemiological survey showed that about 5% of the world population is asymptomatic carriers, i.e they show no apparent symptoms [2].

HBV is highly contagious and is transmitted by percutaneous and permucosal exposure to infected blood and other body fluids (i.e semen and vaginal fluid). The highest concentrations of the virus occur in blood and wound secretions [3]. Moderate concentrations of HBV are found in semen and vaginal fluid and lower concentrations occur in saliva. HBV is not spread by air, food or water. Common modes of transmission include mother to infant, child to child, unsafe injection practices and blood transfusions and sexual contact. HBV may be detected in serum 30-60 days following infection and may persist for widely variable periods of time [3].

Perinatal transmission from mothers to their newborn infants or transmission from one child to another is a major source of HBV infection in many countries where chronic HBV infection is highly endemic [3]. Perinatal transmission usually happens at the time of birth;in-utero transmission is relatively rare, accounting for less than 2% of perinatal infections in most studies. There is no evidence that HBV can be spread through breastfeeding [4].The risk of perinatal transmission depends on the serostatus of the mother. The risk of HBV infection approximately ranges from 70%-90% for positive mothers to 5%-20% for negative mothers [5].

The most probable pathways of child to child spread involve contact of skin sores, small breaks in the skin or mucous membranes with blood or skin sore secretions [6]. HBV may also spread because of contact with saliva through bites as a consequence of the pre-mastication of food [7].

HBV is efficiently transmitted by sexual contact, which accounts for a high proportion of new infections among adolescents and adults in countries with low and intermediate

endemicity of chronic HBV infection. Risk factors for sexual transmission include multiple sex partners, prostitution and lack of protection in sexual activity (e.g. use of condoms). In countries where HBV infection is highly endemic, sexual transmission does not account for a high percentage of cases because most persons have been infected since childhood [8].

HBV may also spread from inanimate objects such as shared towels or toothbrushes, because the virus can survive for at least 7 days outside the body and can be found in high titres on objects, even in the absence of visible blood [9].

HBV is one of the most common infectious viruses in the world. It is estimated that more than two billion people are infected. Approximately 360 million of these are chronically infected [10]. Approximately one million people die each year from HBV related chronic liver disease including liver cirrhosis and hepatocellular carcinoma [11]. Hepatocellular carcinoma is one of the most common cancers in the world, and chronic HBV infection is responsible for 60-90 % of hepatocellular carcinoma in high risk areas [12].

Hepatitis B is a worldwide healthcare problem, especially in developing areas. An estimated one third of the global population has been infected with hepatitis B virus (HBV). Approximately 350-400 million people have lifelong chronic infection [13].

An estimated 40% of people who have been infected with hepatitis B virus do not know how or when they became infected. Most people who get hepatitis B have no recognizable signs or symptoms. The only way the disease can be positively identified is through a blood test, many people are usually surprised to learn when they have donated blood that they test positive for hepatitis B. Hepatitis B blood tests are not usually included in routine blood tests done when having a physical examination [14].

Complications from hepatitis B include progression to hepatocellular carcinoma (HCC) and rarely cirrhosis, glomerulonephritis and polyarteritis nodosa are seen, as well as various dermatologic, cardiopulmonary, joint, neurologic, hematologic, and gastrointestinal tract manifestations [15].

The prevalence of hepatitis B virus infection is relatively high in Africa, having the second highest number of chronically HBV-infected individuals. Currently, Nigeria is classified among the group of countries endemic with HBV infection, with a infected population of 20 million [16].

In Nigeria, the prevalence of HBV infection has been found to be high and places the country among the group of countries endemic for HBV infection [17]. In Lagos, Sothern Nigeria, the reported prevalence rates were 14%, 30% and 56% for HBV related hepatitis, liver cirrhosis and hepatocellular carcinoma, respectively [18]. In North Central Nigeria, the Federal Capital Territory had a prevalence rate of 7.3% among residents [19]. In Kaduna, Kano and Sokoto states of North Western Nigeria, the prevalence rates of 3.9% and 6% were observed [19]. In Nigeria, investigators have found high HBV prevalence among surgeons (25.7%), voluntary blood donors (23.4%) and infants (16.3%) according to [20]. Hepatitis B is the commonest cause of chronic liver disease in Nigeria. In the southern parts of the country, up to 58.1% of patients with chronic liver disease were found HBsAg positive [21].

In view of the high prevalence of HBV infection in Nigeria and the devastating consequences this work set out to study the seroprevalence of the infection among patients attending Defense Headquarters Medical Centre, Asokoro, Abuja.

2.0 MATERIALS AND METHODS

2.1 STUDY DESIGN

The study was a randomized cross-sectional study to determine the prevalence of Hepatitis B virus (HBV) infection in the study area. The study involved individuals who were receiving medical care at Defence Headqarters Medical Centre, Abuja. A well designed questionnaire was used to obtain information from the subjects.

2.2 STUDY AREA

The Defence headquarters medical centre is located in Abacha barracks Karu road, Asokoro, Abuja. It is situated in Abuja municipal area, FCT, Nigeria and its geographical coordinates are 9.0500°N and 7.5396°E and has a latitude of 9.0408 and longitude of 7.5139 [22].

2.3 STUDY POPULATION

This study included two hundred and sixty (260) patients who came for medical attention at Defence Headqarters Medical Centre, Abuja during the study period (May-August, 2020). The patients selected for the above study were from various age groups (17-66 years).

2.4 SAMPLE SIZE

The sample size was determined using the equation described by (Creative research system, 2016)

$$N=\frac{Z^2 \times P\,(1-P)}{D^2}$$

Where;

Z = Statistics for a level of 95% confidence interval = 1.96

P = Prevalence rate from previous study = 12.2% [23].

D = 5% precision = 0.05

N = Sample size

$$= \frac{1.96^2 \times 0.122\ (1-0.122)}{0.05^2}$$

$$= \frac{3.842 \times 0.122\ (0.878)}{0.0025}$$

$$= \frac{0.412}{0.0025}$$

= 164.8 samples

So therefore the approximated sample size for this research is 165 samples.

2.5 ETHICAL CLEARANCE

Ethical approval for the study was obtained from Federal Capital Territory Health Research Ethics Committee, Abuja, Nigeria. A written informed consent was also obtained from every participating patient.

2.6 SAMPLE COLLECTION

Five millimeters of blood was collected from each subject using venipuncture method by the medical personnel in the hospital. The blood samples were collected inside sterile EDTA bottles and transported to the microbiological laboratory of Bingham University where the laboratory investigations were carried out. The samples were refrigerated pending the time of running the test. On the whole two hundred and sixty samples were collected. A pretested questionnaire was administered to each patient in order to obtain some demographic data of the subjects.

2.7 LABORATORY INVESTIGATION

2.7.1 TEST PROCEDURE FOR HEPATITIS B SURFACE ANTIGEN

In the laboratory the samples were allowed to equilibrate at room temperature after removal from the refrigerator the serum was carefully separated from each blood sample by centrifugation at 3000 rpm for 5 minutes. After the samples were centrifuged, each serum was then screened for the presence of Hepatitis B surface antigen (HBsAg).The test was run in accordance with the method of [24]. The test strip used was manufactured by Nantong Diagnostic Biotechnology Company limited in Jiangsu, China. Each test strip was removed from the foil pouch by tearing at a notch and dipped into the serum sample with excess serum drained off at the bottle wall. The strip was taken out and laid on a flat clean dry non-absorbent white ceramic tile. The results were read after 15 minutes and recorded as positive or negative.

INTERPRETATION OF RESULTS

- If two lines appeared, i.e the control line and the test line, it indicated that the test was positive

- If one line appeared, i.e the control line only, it indicated that the test was negative

- If no line appeared the test was invalid and a repeat test was carried out.

2.8 DATA ANALYSIS

The data collected during the research was presented in forms of tables and figures. Results were analyzed statistically using the chi square.

3.0 RESULTS

Of the 260 samples screened, 10 (3.8%) were seropositive and 250 (96.2%) were seronegative. Therefore the overall prevalence of Hepatitis B surface antigen among the sampled population was 3.8% as shown in Table 1.

Table 1: Prevalence of HBV among patients in Defense Headquarters Medical Centre Asokoro, Abuja

RESULT	NUMBER SCREENED	PREVALENCE (%)
POSITIVE	10	3.8
NEGATIVE	250	96.2
TOTAL	260	100.0

With regards to age distribution of the infection the highest prevalence (2.31%) of HBV infection in was found among patients within the age group 27-36 years of age, followed by1.15% in age group 17-26 years, then 0.38% among the age group 37-46 years. Age groups 47-56 years and 57-66 years 0.0%, meaning that there was no one among the two age groups that was seropositive (Fig. 1).

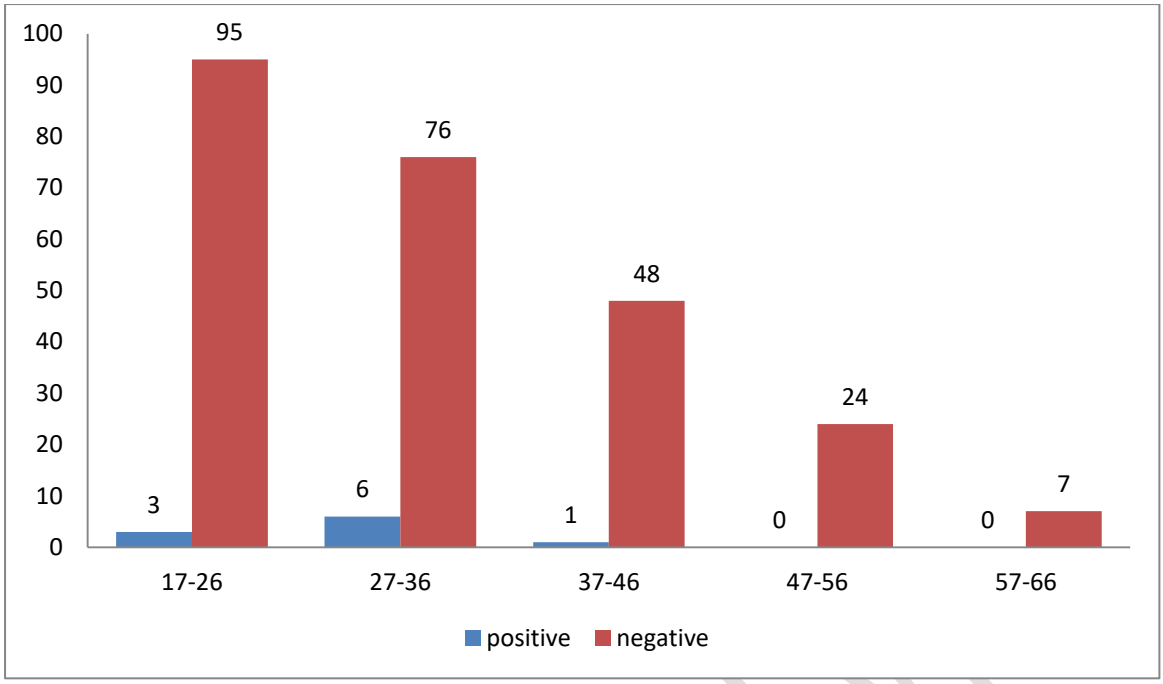

FIGURE 1: AGE DISTRIBUTION OF HBV INFECTION

Fig. 2 shows the gender distribution of HBV infection with respect to gender. Of the 260 patients screened, 150 were males and 110 were females where the females had a prevalence rate of 4.55% and the males had a prevalence rate of 3.33%. The result here was not statistically significant to gender (P> 0.05).

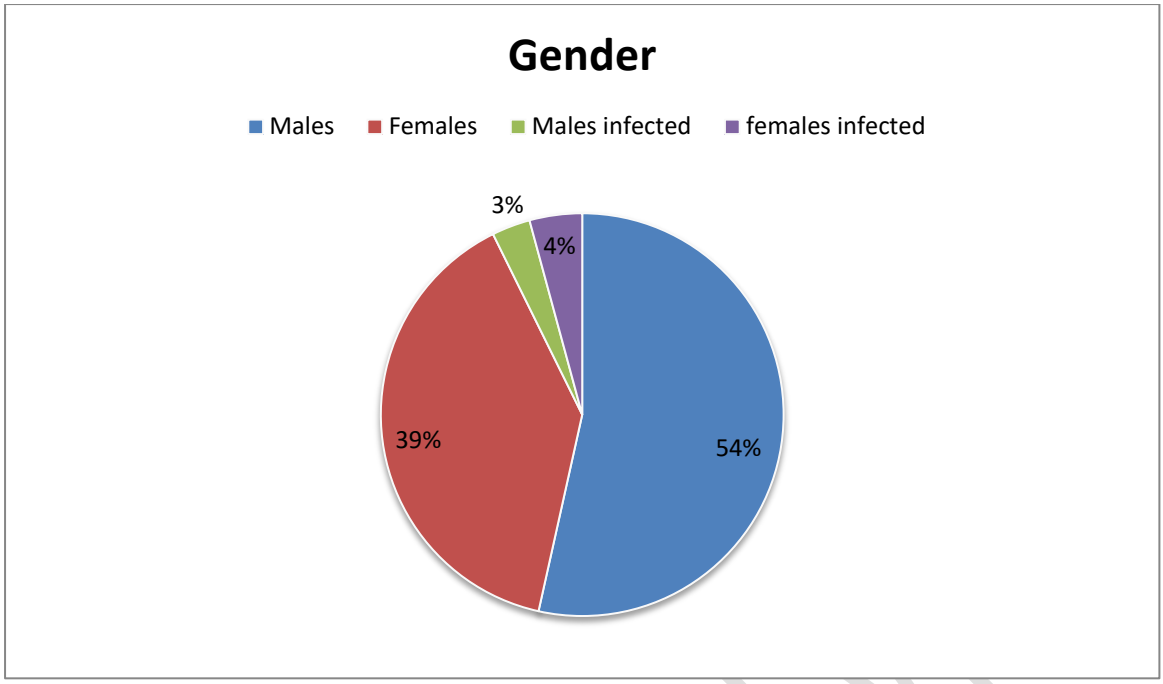

FIGURE 2: THE PREVALENCE OF HBV AMONG PATIENTS BY GENDER

Table 2 shows the prevalence of Hepatitis B surface antigen based on the patients' awareness about the infection showed that, out of the 217 that were knowledgeable about the infection, 4 out of the 217 (1.84%) were infected and 6 out of 43 (13.60%) that were not knowledgeable aboutthe infection were infected as shown in table 4. The result was not statistically significant (P > 0.05).

Table 2: Prevalence of HBV based on awareness on the existence of the disease

AWARE	NO SCREENED	NUMBER INFECTED (%)	NUMBER NOT INFECTED (%)
No knowledge about HBV	43 (16.50)	6 (13.60)	37 (86.04)
Knowledge	217 (83.50)	4 (1.84)	213 (98.16)

about HBV

TOTAL 260	**10**	**250**

X^2 = 1.052 , *df* =1, P> 0.05

Table 3 shows the prevalence of the infection with respect to the social status of the patients. The patients were classified into three: High class, Middle class and the Low class. The high class in which 101 (38.85%) patients were examined 3 (2.97%) were positive for HBsAg. Out of 63 (24.23%) examined in the middle class 2 (3.17%) were positive for HBsAg. Finally in the lower class, 96 (36.92%) were examined and 5 (5.21%) were positive for HBsAg. The result was not statistically significant (P > 0.05).

Table 3: Prevalence of HBV with respect to social status

Social status	number screened	Number infected (%)	Number not infected
High class	101(38.85%)	3(2.97%)	98(97.03%)
Middle class	63(24.23%)	2(3.17%)	61(96.83%)
Lower class	96(36.92%)	5(5.21%)	91(94.79%)
Total	**260**	**10**	**250**

X^2 = 0.216,*df* =2, P> 0.05

4.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

4.1 DISCUSSION

The study examined the prevalence of HBV infection among patients receiving medical care at Defence Headquarters medical centre, Asokoro, Abuja. The observed seroprevalence was 3.8%. This shows that there is a moderate endemicity of HBV among patients receiving medical care at Defence Headquarters medical centre, Asokoro, Abuja. According to WHO criteria it defines low prevalence to be less than 2%, moderate prevalence as 2-8% and high prevalence to be greater than 8% [25]; [2]. The prevalence rate recorded in this study is close to that of [26] who recorded prevalence rate of 6.06% among patients receiving medical care

in Lagos. However, it is lower than the 7.3% and 6.70% reported by [27] and [28] respectively. The prevalence is also lower than the 9.0% prevalence reported by [2] among pregnant women attending antenatal at Plateau State Specialist Hospital, Jos.

The prevalence rate of 3.8% obtained from this study is equally lower than 8.2%, 16.3% and 7.9% recorded by [29]; [30]; [31], respectively. The differences in prevalence rates obtained in different parts of the country, and even worldwide, could be as a result of multiple factors that determine the seroprevalence of hepatitis, which vary from person to person and region to region [32].

With regards to age distribution of the infection the highest prevalence (2.28%) of HBV infection in was found among patients within the age group 27-36 years of age. Although our result here was not statistically significant ($P>0.05$), it could be explained by the relationship between hepatitis infection and high risk of sexual practices which is said to be common amongst this age group [32]. Similar results were obtained by [29]; [33]; [34] and [35]; all of who reported highest prevalence rate of the infection among this age bracket (27-36 years). The high prevalence rate of HBV among this age group in this study could suggest that most of them might have gotten the infection through sex since members of this age bracket are usually sexually active [32].

With respect to gender, the females had a prevalence rate of 4.55% and the males had a prevalence rate of 3.33%. This result was not statistically significant ($P>0.05$), however the result differs from the report by [36], who reported higher prevalence rate of 12.7% in males than 2.1% in females; and [37] who said that males are 2.8% times more likely to get infected with HBV compared to their female counterparts.

The prevalence of hepatitis B surface antigen based on the awareness of the existence of the disease was 1.84% in patients that were aware of the disease, while those who were not aware

of the disease had a prevalence rate of 13.60%. Though our result here was not statistically significant (P>0.05), similar results were obtained by [38]; [39] who both had higher prevalence rates of 87.5% and 64.0%, respectively among individuals that were not knowledgeable about the disease. The higher HBV infection prevalence among those that were not knowledgeable about the disease is not unexpected since being knowledgeable about a disease and its mode of transmission can help people to avoid things that could predispose them to the disease [36].

Social status may also be responsible for variations in prevalence rates. The highest prevalence rate of HBV among individuals in relation to the social status in the present work was among the low class which had a prevalence rate of 5.21% and the lowest prevalence was among the high class with a prevalence rate of 2.97%. This result is similar to a study that was carried out by [2], which reported a higher prevalence in the lower class and the lowest prevalence was found in the high class status. Our result, though not statistically significant (P>0.05), this may be due to poor sanitary conditions and the low standard of living among the individuals in the lower class. The high class may not encounter these problems and are able to take care of themselves, thus they had the least prevalence. Also the lower class group includes people who frequently require blood or blood products [36]; this could be another factor for the high prevalence of the infection among the low class group.

4.2 CONCLUSION

The result obtained from this study revealed the prevalence rate of hepatitis B surface antigen to be 3.8% which implies that hepatitis B infection among patients receiving medical care at Defence Headquarters Medical Center, Asokoro, Abuja is on the average and significant. Therefore the situation calls for a prompt medical intervention in Asokoro and its environs, as well as the general public at large, so as to prevent the epidemic of the disease.

4.3 RECOMMENDATIONS

The following recommendations can be emphasized to serve as control measures against the occurrence and spread of the disease.

- Blood that is being donated should be screened thoroughly to know their HBV status before blood transfusion occurs.
- Programs such as health education, aimed at enlightening the public on the dangers of hepatitis B virus infection and those risk factors that could predispose them to the infection should be organized periodically.
- All infants born to mothers who are positive to HBV should be administered HBV vaccines at birth in order to reduce the spread of the infection.
- Routine HBV screening should be done for free in government hospitals
- HBsAg seropositive patients should seek proper treatment
- The government should provide free medical care for HBV patients as much as possible so as to make the service accessible to even people of low economic status.
- Since there is effective treatment, positively screened individuals should properly be treated to reduce the spread of the infection.
- Healthcare workers in hospitals should be offered free hepatitis B vaccines in order to prevent nosocomial transmission of the infection.

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