

Prevalence of Hepatitis B Surface Antigen among HIV Patients Attending Limi Hospital, Abuja

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Abstract- Hepatitis B (HBV) is one of the commonest and wide spread infections of humans and it is most prevalent in developing countries, including Nigeria. The disease is closely related to HIV, with one influencing the other in no small measure. This study aims at determining the prevalence of hepatitis B surface antigen (HBsAg) among HIV positive patients attending Limi hospital in the Central Area of Abuja. A total of 250 HIV patients were screened for HBsAg, using rapid monochromatic test strip to determine the presence or absence of HBsAg in the samples. Of the 250 serum samples screened, 35 were positive for HBsAg, giving an overall prevalence of 14.0%. The highest prevalence rate (19.4%) was recorded among patients within the age group of 51-60 years, while the lowest prevalence of 12.3% was recorded among patients within the age group of 21-30 years. The prevalence was also higher in the female population (14.3%) than in the male population (13.6%). The prevalence of the disease with respect to socioeconomic status of the patients showed highest prevalent rate (22.34%) among people with low socioeconomic status, followed by a prevalence rate of 18.18% and 3.96% among people with middle and high socio-economic status, respectively. The prevalence based on knowledge of the patients about the infection showed 20.43% prevalence among people that were not aware and 10.19% prevalence among people that were aware. The prevalence of the infection in this study is statistically related to all the parameters tested, i.e. Age, Sex, Social status and knowledgeability of the subjects about the infection. The study here, thus confirms a high prevalence of HBV infection among the studied population. Public enlightenment, routine diagnosis and proper treatment of infected people are recommended for the public in general, and among immunocompromised patients in particular.

Index Terms- Hepatitis, Cirrhosis, Surface antigen, Virus, Prevalence, Limi Hospital Abuja

I. INTRODUCTION

Hepatitis is a common infection of the liver in which the liver cells called hepatocytes are inflamed. Hepatitis can be induced by both infectious and non-infectious agents. The infectious agents include a variety of different hepatitis viruses which include hepatitis A virus (HAV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Hepatitis D virus (HDV) and Hepatitis E virus (HEV). Other two newly discovered hepatitis viruses are Hepatitis G virus (HGV) and Transmission Transfusion Virus (TTV) (Prescott *et al.*, 2008). Hepatitis can also result from bacterial infection (Alabi and Halim, 1999).

Non-infectious agents that can cause hepatitis include: an overactive immune system, use of drugs, alcoholism, toxic chemicals from paint and spray thinners, and environmental toxins (Diestag and Hollinger, 1995; Alabi and Halim, 1999).

Hepatitis can also result in autoimmune infection in which the body mistakenly sends disease fighting cells to attack its healthy tissues, which is the liver. Viruses such as the cytomegalovirus, Epstein-Barr virus, herpes simplex virus, rubella and yellow fever viruses have also been implicated as causal agents of liver inflammation (Cheesbrough, 2006).

Of all human hepatitis viruses, hepatitis B virus (HBV) 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 (Lindsey, 1990). The virus can, therefore, be transmitted through blood and secretions, unprotected sexual contact, blood transfusion, use of contaminated needle and syringe and vertical transmission from mother to child during birth (Prescott *et al.*, 2008). It can also be spread by fomites (inanimate objects), sharing of tooth brush, abrasion and sexual contact with infected persons (Otegbayo *et al.*, 2003; Keffe and Marcellin, 2007; Olokoba *et al.*, 2009; Kurbanov *et al.*, 2010).

Hepatitis B virus infection is a widespread problem. Epidemiological survey shows that about 5% of the world populations are asymptomatic carriers; they show no apparent symptoms (Omer, 1995). However, sometimes there could be fever, loss of appetite, nausea, fatigue, abdominal discomfort and other symptoms such as jaundice which occurs as a result of bilirubin accumulation in the skin and other tissues resulting in yellowish appearance which is more prominent on the palm and eyes. The jaundice appears within three (3) months incubation period (Prescott *et al.*, 2005). The world health organization estimated that approximately 400 million people in the world are affected with hepatitis B including endemic areas such as sub-Saharan Africa, South East Asia and South America. However, most of the carriers were reported to have acquired it perinatally (Haller *et al.*, 1989).

Hepatitis B virus has caused epidemics in Asia and Africa and it is endemic in China and various other parts of Asia (Williams, 2006). About 2 billion people have been infected with this virus, 350-400 million people are chronic carriers of the disease. In the acute phase, it causes vomiting, jaundice and rarely death, it eventually leads to liver cirrhosis and liver cancer, leading to death of the infected person as it is very poor in response to chemotherapy (Chang, 2007).

Human immunodeficiency virus (HIV) infection appears to influence the natural history of infection with certain hepatitis virus. There is a high degree of epidemiological similarities

between HBV and HIV as regards to high risk group, routes of transmission and prevalence of the virus in the body fluids. Other factors associated with acquisition of HBV include increasing age, male gender, and low level of education, history of previous surgery, multiple sexual patterns, HIV infection, and non-use of condom (Mehmet *et al.*, 2005).

HBV and HIV share common routes of transmission; therefore, markers of either active or past infection are present in many HIV infected patients. Serological markers of past or present HBV infection have been reported in up to 90% of HIV patients. It has also been reported recently that HIV positive men with HBV are at risk of liver related mortality (Thio *et al.*, 2002).

The level of hepatitis B virus infection seems to have risen over the years and has become a thing of concern. Hepatitis B virus has caused epidemic in Africa. About 350 million people remain infected chronically and have become carriers of the virus. One million people a year die from chronic or acute hepatitis, cirrhosis or primary liver cancer (WHO, 1987).

Nigeria is said to be among the group of countries endemic for hepatitis infection with about 20 million people infected with the disease (Ahmad, 1998). In Nigeria, the prevalence of HBV in normal population range from 2.7% to 13.3% (Leukonia *et al.*, 1969). In 1991 it was 1.4%, 5.8% by 2002. The prevalence rates in some states are: Bauchi 13.3% (Nasidi *et al.*, 1983), 13.7% in Ibadan (Ayoola *et al.*, 1986) and 22% in Maiduguri (Harry *et al.*, 1994). Nigeria is a holoendemic area for HBV, with carrier rate of 15 to 35% (Bojuwoye, 2007) and an estimated 12% of the total population being chronic carriers of HBsAg (Olumide, 2007).

The human immunodeficiency virus (HIV) poses a higher risk for patients with chronic (prolonged) hepatitis and its potential complication. Studies conducted in Northern Nigeria have reported lowest prevalence of 10.3% and highest prevalence of 28.7% in patients with HIV infection (Sirisera *et al.*, 2002) and a prevalence of 10.3 in the general population (Baba *et al.*, 1998). Another study conducted in Maiduguri revealed similar prevalence rate of 15.0% in HIV positive patients (Baba *et al.*, 1998). This therefore emphasizes the importance of detecting the group of HIV infected individuals who are concurrently infected with HBV (Gitlin, 1997).

The situation described above is frightening and calls for a thorough investigation in the Nigerian population. In HIV patients (already immunocompromised) the acquisition and spread of hepatitis B infection can be great and the consequences could be very serious. It is in this vein that the present work was undertaken to determine the magnitude of Hepatitis B virus infection among HIV patients, with a view to sensitize the public and make useful recommendations so as to reduce the disease burden, generally in the public and among the HIV patients in particular.

Limi hospital and maternity was selected for this work because of its strategic location in the Federal Capital Territory (FCT).

The aim of this study, therefore, is to determine the prevalence of hepatitis B surface antigen (HBsAg) in HIV positive patients attending Limi hospital in Central Area of Abuja, with the objectives of determining the occurrence of HBsAg in the study population, to obtain base line information on the disease burden in the study population; also to determine the Age, Gender and Socioeconomic status distributions of HBsAg in HIV infected

patients in order to establish possible relationships. Also the Knowledgeability of the people screened about the infection was considered.

II. MATERIALS AND METHODS

Study Area

The study was carried out at Limi hospital and maternity, that provides a secondary health care service in the central area of Abuja.

Study Population

The study population was HIV infected patients (males and females) within the age group of 21-60 years.

Sampling Method

A randomized cross sectional method was used for the study.

ETHICAL CONSIDERATION

Permission was sought from the authority of the hospital used, after which the consent of the HIV patients was sought, and blood was collected from the volunteers.

Sample Collection

Two millimeters of blood samples were collected from each of the 250 HIV infected patients during their visit to the hospital, into a sterile EDTA bottle for laboratory analysis. Blood samples were collected aseptically by venipuncture using 2ml sterile disposable syringe and needles. The samples were quickly transferred in baskets to the laboratory where they were stored at -15 to -20°C. The samples were collected between July-August.

Sample Processing

In the laboratory plasma was carefully separated from each blood sample by centrifugation at 300rpm for 5 minutes. Each serum was screened for the presence of HBsAg by the one step HBsAg test strip [Skytec for HB and C (USA)], which is a rapid chromatographic immunoassay for qualitative determination of HBsAg in the serum. All the sera specimens were allowed to equilibrate to room temperature prior to testing. The test was run in accordance with the method of Chessbrough (2006). The results were recorded and subjected to statistical analysis.

III. RESULTS

A total of 250 blood samples were screened for Hepatitis B Surface Antigen (HBsAg) among HIV patients attending Limi Hospital and Maternity in Central Area, Abuja. Of the 250 samples, 35 (14.0%) were positive and 215 (86.0%) were negative. Therefore the overall prevalence of Hepatitis B surface antigen among the sampled population was 14.0%. The prevalence of Hepatitis B surface Antigen according to age in the sampled population is shown in table 1. The highest prevalence was found among age group 51-60 years (19.4%) and lowest in age group 21-30 years (12.3%). Age group 31-40 years had a prevalence of 14.5% while the age group 41-50 years had a prevalence of 12.9%. There is a significant association between Hepatitis B surface antigen and age ($P > 0.05$) as shown in table 2.

Of the 250 patients screened, 103 and 147 were from male and females respectively. The prevalence of hepatitis B Surface Antigen (HBsAg) by gender shows a prevalence of 13.59% (14

out of 103 positive cases) and 14.29% (21 out of 147 positive cases) for male and female, respectively. This indicates a higher prevalence rate among the female than the male population and statistically there is a significant association between Hepatitis B surface antigen and gender ($P > 0.05$) as shown in table 3.

The prevalence of Hepatitis B surface antigen by socio-economic status showed that 22.34% of people with low socio-economic status were infected with hepatitis B virus, 18.18% of people with average socio-economic status were positive for Hepatitis B surface antigen infection. The high socioeconomic class had seroprevalence of 3.96%. However, there is significant association between hepatitis B surface antigen and the socio-

economic status of the people ($P > 0.05$). This is shown in table 4.

The prevalence of hepatitis B surface antigen based on the awareness on the existence of the infection showed that, out of the 157 that were aware of the existence of the infection, 16 out of 157 (10.19%) were infected and 19 out of 93 (20.43%) that were not aware of the existence of the infection were infected. There is a significant association between hepatitis B surface antigen and awareness on the existence of the disease, ($P > 0.05$) as shown in table 5.

TABLE 1: THE OVERALL PREVALENCE OF HEPATITIS B AMONG HIV PATIENTS IN LIMI HOSPITAL

Infection for	Screened	Number of people examined	Number of people infected	Number of uninfected people	Prevalence (%)
Hepatitis B		250	35	215	14.0

TABLE 2: PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG HIV INFECTED PATIENTS BY AGE

AGE (YEARS)	NUMBER EXAMINED (%)	NUMBER INFECTED (%)	NUMBER NOT INFECTED (%)
21-30	66 (26.40)	8 (12.12)	58 (87.88)
31-40	83 (33.20)	12 (14.46)	71 (85.54)
41-50	70 (28.0)	9 (12.86)	61 (87.14)
51-60	31 (12.40)	6 (19.35)	25 (80.65)
TOTAL	250	35	215

TABLE 3: PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG HIV INFECTED PATIENTS BY GENDER

GENDER	NUMBER EXAMINED (%)	NUMBER INFECTED (%)	NUMBER NOT INFECTED (%)
MALES	103 (41.20)	14 (13.59)	89 (86.41)
FEMALES	147 (58.80)	21 (14.29)	126 (85.71)
TOTAL	250	35	215

TABLE 4: PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG HIV PATIENTS BY SOCIO ECONOMIC STATUS

SOCIO ECONOMIC STATUS	NUMBER SCREENED (%)	NUMBER INFECTED (%)	NUMBER NOT INFECTED (%)
LOW	94 (37.60)	21 (22.34)	73 (77.66)
AVERAGE	55(22.0)	10 (18.18)	45 (81.82)
HIGH	101 (40.40)	4 (3.96)	97 (96.04)
TOTAL	250	35	215

TABLE 5: PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG HIV PATIENTS BASED ON AWARENESS ON THE EXISTENCE OF THE DISEASE.

AWARENESS	NUMBER SCREENED (%)	NUMBER INFECTED (%)	NUMBER NOT INFECTED (%)
KNOWLEDGE ABOUT HBV INFECTION	157 (62.80)	16 (10.19)	141 (89.81)
NOT KNOWLEDGABLE ABOUT HBV INFECTION	93 (37.20)	19 (20.43)	74 (79.57)

TOTAL	250	35	215
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IV. DISCUSSION

This study examined the prevalence of Hepatitis B surface antigen in HIV patients attending Limi Hospital and Maternity. The observed prevalence was 14.0%, 35 out of the 250 samples examined. This shows a high prevalence of hepatitis B surface antigen among HIV patients attending Limi hospital and Maternity, reaching an endemicity level because according to Hodges *et al.*, (1998), high endemicity for hepatitis is defined as HBsAg greater than 7%. The 14.0% prevalence exceeds the national range of 2.7 to 13.3% in normal population (Leukonia, 1969). However, the prevalence recorded among the HIV patients in this work is similar to the results of other previous researchers like Nasidi *et al.*, (1983) who obtained 13.3% in Lagos, Baba *et al.*, (1998) obtained 15.0% in Maiduguri, Sule *et al.*, (2010) obtained 14.0% prevalence among HIV patients attending Universal Hospital, Anka, Kogi State Nigeria. Also the prevalence recorded in this study is similar to that of Agbaji, (2005) who reported 14.5% prevalence in Jos University Teaching Hospital. However, it is lower than the 28.7% prevalence reported among HIV patients in the Northern Nigeria by Sirisera *et al.*, (2002). The prevalence is also lower than the results of Balogun *et al.*, (2010) and Harry *et al.*, (1994) who obtained a prevalence of 28.4% and 22.0%, respectively. The different 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. With respect to gender, females had a prevalence rate of 14.29% and the males had a prevalence rate of 13.59%. This differs from what was reported by Mehmet *et al.*, (2005), who reported higher prevalence rate of 12.7% in males than 2.1% in females concluding that male sex was an important risk factor for HBsAg positivity. The higher prevalence in females is similar to the results obtained by Okonko *et al.*, (2012) who reported higher HBsAg prevalence in females (10.2%) than males (5.5%), Sule *et al.*, (2010), who reported that females had higher seropositivity for HBsAG (15.6%) than the males (11.7%). This finding is also similar to the report of Okechukwu *et al.*, (2014), who found a higher prevalence in females (65.5%) than males (34.4%). Another study of 260 HIV positive patients in Abuja, Nigeria, showed higher prevalence of (12.5%) in females than males (9.2%), (Adewole *et al.*, 2009). Future researches will, therefore, be necessary to clear the discrepancies on the gender situation as regards HBV patients.

In this research, the age group 21-30 years had a prevalence of 12.12%, 31-40 years had a prevalence of 14.46%, 41-50 years had a prevalence of 12.86% and 51-60 years had a prevalence of 19.35%, contradiction reports by Adewole *et al.*, (2009), who had a higher prevalence of 14.6% in the 31-40 age group and 7.1% in the >40 age group. Lar *et al.*, (2013) and Okechukwu *et al.*, (2014) also found a higher prevalence rate of 12.2% in the 21-30 age groups and 5.0% in the >40 years age group. Human Immunodeficiency virus shares common route of infection with hepatitis B virus (HBV). The difference among the group studied was statistically significant; hence the disease is age dependent. This result depicts that the likelihood of complications of acute

chronic liver disease and overall mortality are higher in elderly population. It is also well established that older individuals with viral hepatitis have a higher mortality rate now. Furthermore, physiological changes associated with ageing, such as diminished immune response, metabolic derangement, nutritional deficiencies, and greater exposure to environmental hepatoxins, also contribute to worse outcome by HBV prevalence in the elderly (Davis and Robert, 2010). This research agrees with Mehmet *et al.*, (2005) which states that increasing age is a factor associated with the acquisition of hepatitis B virus.

The prevalence of hepatitis B surface antigen based on the awareness of the existence of the disease was 10.19% in patients that were aware of the disease, while those who were not aware were 20.43%. This research shows that there is a significant association between the infection and the level of awareness of the people. This result with higher HBV prevalence among those that were not aware or knowledgeable about the disease is not unexpected since being aware of the existence of a disease and its mode of transmission can help people in avoiding things that could predispose them to the disease.

Naturally, the socio-economic status of people can go a long way in determining their level of acquiring some diseases. This can account for the highest prevalence of 22.34% in the low socioeconomic group, followed by those with average or middle socio-economic status (18.18%) compared to people with the high socio-economic status that had 3.96% prevalence.

V. CONCLUSION

The result obtained from this study revealed the prevalence rate of Hepatitis B surface antigen to be 14.0% which implies that hepatitis B infection is endemic among HIV patients attending Limi Hospital and Maternity. The high prevalence of HBV among HIV patients in this study is an indication of what is most likely obtained in the public generally, hence the situation calls for a prompt medical intervention among HIV patients in particular and the general public at large, so as to prevent the epidemic of the disease.

VI. RECOMMENDATIONS

The following recommendation can be emphasized to serve as preventive and control measures for the spread of the virus (hepatitis B virus) in the study area and the general public at large.

- Programs such as health education, aimed at enlightening the public on the dangers of Hepatitis B virus infection and those factors that could predispose them to the infection, should be organized periodically.
- Donated blood should be thoroughly screened to ascertain their HBV status before blood transfusion.
- Since there is effective treatment, positively screened individuals should be treated thoroughly to reduce the spread of the infection.
- People should have access to counseling and health care services.

- Awareness campaign should be linked with that of HIV/AIDS since both viruses (HBV and HIV) have same routes of transmission.

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