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PREVALENCE OF HEPATITIS B AMONG PATIENTS IN MICHAEL OKPARA UNIVERSITY OF AGRICULTURE, (MOUAU) CLINIC AND MADONNA CATHOLIC HOSPITAL UMUAHIA, ABIA STATE

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ABSTRACT

To determine the prevalence of Hepatitis B among patients in Michael Okpara University of Agriculture, (MOUAU) clinic and Madonna Catholic Hospital Umuahia, Abia State. Blood samples were collected aseptically using a sterile syringe and needle. About 2-5ml of blood was collected from each patient and conveyed in ice packs to Microbiology Laboratory for pre-vaccination tests. On-the-spot testing for HBsAg was conducted using Smart Check HBsAg (Globalemed, Cape Town, South Africa) according to the manufacturer's instructions. This study revealed that about 46.5% of the study participants were positive for hepatitis B surface antigen, while the prevalence of age distribution of Hepatitis B surface antigen among male and female patients revealed that the rate of Hepatitis B Surface Antigen was highest in patients between the age 16-34 years at a percentage prevalence of 19(55.9%). This study also revealed that Hepatitis B virus prevalence rates were the most prevalent among female patients with a positive percentage value of 47.7%.The prevalence rate of HBsAg was higher in the 16-34 age group than in the other age groups tested. This high prevalence rate calls for more awareness on effective HBsAg immunization program in Nigeria. The importance of vaccination in the fight against hepatitis B cannot be overstated, emphasizing the necessity for universal immunization of all people in the study's age group and the creation of measures to prevent mother-to-child transmission. As a result, it is advised that adolescents born before the hepatitis B vaccine era in Nigeria receive public health education and vaccination against the infection.

Keywords: Prevalence, Hepatitis B infection, Nigeria, Patients, hepatitis B virus

INTRODUCTION

The hepatitis B virus (HBV) is among the most frequent viral infectious agents with global public health implications (Berinyuy *et al*., 2019). Hepatitis B virus infection is a potentially fatal liver infection that has become a serious global health issue. Hepatitis B infection has been linked to death from cirrhosis, liver cancer, and non-liver malignancies (Song*et al.,* 2019). Hepatitis B virus infection is said to have been first recognized as a public health concern when it showed as an adverse event following a vaccination campaign (WHO, 2009).Globally, an estimated two billion people are infected, with 350 million more suffering from the chronic form of the disease. More than 50 million people in Africa are chronically infected, with a mortality rate of around 25% (Ott *et al*., 2012). In 2013, viral hepatitis was the world's leading cause of about 1.46 million deaths. The consequences of hepatitis B virus (HBV) infections account for more than 90% of this burden (Stanaway *et al*., 2016).

In Sub-Saharan Africa, the virus is carried by 9% to 20% of the population (Walana *et al*., 2014). Once a chronic infection has been established, HBV can reside in the liver for the

rest of one's life, causing not only HBV-related severe complications, including cirrhosis and hepatocellular carcinoma (Jia and Zhuang, 2007), but also serving as the virus's reservoir (Zou *et al*, 2001)**.** During the primo-infection phase, symptoms range from sub-clinical hepatitis to icteric, hyperacute, acute, and subacute hepatitis. Also, symptoms range from an asymptomatic carrier state to chronic hepatic cirrhosis and hepatocellular cancer during the chronic phase. The incubation period for the acute phase is 1-6 months (James *et al*, 2012). Anicteric hepatitis is the most common form of this disease, and most patients are asymptomatic at this stage. Anicteric hepatitis patients are more likely to develop chronic hepatitis. A prodromal period is associated with icteric hepatitis B, during which a serum sickness-like illness might ensue (Greenwood *et al*, 2000).

Blood transfusion, blood products, body fluids (urine, sperm, sweat, saliva, and tears), use of contaminated needles, vertical transmission (mother to child through the infected birth canal), and sexual contact are the most common transmission routes (Brooks *et al*, 2007). The infection in neonates born to chronically infected moms has a 70–90 percent chance of developing to a chronic stage (Tong *et al*, 2005). To avoid non-curable infectious illnesses, the necessity for safe blood or blood products in life-saving procedures is crucial (Walana *et al.*, 2014). Transfusion-transmitted diseases, such as hepatitis B, are dangerous with blood transfusions, and the World Health Organization has recommended a pre-transfusion blood test to assess their severity. In non-endemic nations, the risk of HBV infection is higher than that of hepatitis C virus (HCV) (Kwon and Lee, 2011). Nigeria, a tropical country, has been highly endemic for HBV infection. An estimated 75 percent of the population has been exposed to the virus at some point in their lives (Sirisena *et al*, 2002). Approximately 60 million Africans are currently afflicted (Ajuwon *et al*, 2021). Although this incidence is lower than the 12.5 percent reported in a research by Hamza *et al*. (2013) and the 11.5 percent prevalence acquired from a health institution in North central Nigeria (Tremeau-Bravard *et al*., 2012), it is still higher than the estimated 9.9 percent prevalence of the hepatitis B virus among HIV patients.

In Nigeria, the danger of developing HBV is serious because of low vaccination rates and because up to 75% of the population will be exposed (Makuza *et al*, 2019). Researchers have provided various national and risk group estimates. According to previous reports, the average risk Nigerian population has a 10-15% prevalence (Ajuwon *et al*, 2021). In Nigeria, researchers discovered a significant frequency of HBV among surgeons (25.7%), voluntary blood donors (23.4%), and babies (16.3 per cent) (Sadoh and Sadoh, 2013). In a 2012 study in Kano, Nigeria, 12.3% of 440 HIV infected patients tested positive for HBV (Hanza*et al.*, 2013). Although pregnant women are typically thought to be at minimal risk for HBV infection, in Nigeria, rates as high as 11% have been documented (Mbawuaga *et al*., 2008) .Several authors have published studies on the prevalence of HBV in Nigerian subpopulations, with estimates ranging depending on the population and methodologies utilized. However, there is no credible national estimate of HBV exposure in the general population or among individuals most likely to benefit from early identification, monitoring, and treatment (Ott *et al*., 2012).

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MATERIALS AND METHODS

STUDY AREA

The study area was comprised of the Michael Okpara University of Agriculture, (MOUAU) Clinic and Madonna Catholic Hospital Umuahia, Abia State. Michael Okpara University of Agriculture, Umudike is located in Ikwuano L.G.A. of Abia State which is within the South-Eastern part of Nigeria. The capital is Umuahia. It is comprised of a total population of about 4,112,230. Madonna Catholic Hospital is located at Ohokobe Afaraukwu Aba Road Umuahia in Umuahia North LGA, Abia State.

Study Period

The study was carried out in June to September 2021.

Population of Study

A total of hundred (100) apparently sick patients of different ages and socioeconomic status attending special treatment at MOUAU clinic and Madonna Catholic Hospital Umuahia, Abia State served as the study population.

Inclusion and Exclusion Criteria

All subjects who gave informed consent were included in the study. Subjects who had once been vaccinated with the required three doses of the vaccine and those who declined to offer consent were excluded from the study.

Collection of Samples

Samples were collected aseptically using a sterile syringe and needle, about 2-5ml of blood was collected from each patient and conveyed in ice packs to Microbiology Laboratory for pre-vaccination tests.

Qualitative Hepatitis B Surface Antigen (HBsAg) Test

On-the-spot testing for HBsAg was conducted using Smart Check HBsAg (Globalemed, Cape Town, South Africa) according to the manufacturer's instructions. Test was performed within one 30min of specimen collection. The immunochromatographic reaction was allowed to take place within a few minutes and the result read at exactly 15 minutes after (Joanah *et al*., 2016).

Confirmatory Hepatitis B Surface Antigen (HBsAB) Test

A test tube was filled with around 3ml of the blood sample. The serum was obtained by centrifuging the material at 3000rpm for 10 minutes. Shantest^{Tm}–ELISA (Shantha Biotechnics Ltd, Hyderated India) kit was used. Following the manufacturer's instructions, two drops of serum were pipette onto the absorbent end of the test strip using a Pasteur pipette. The result was noticed after the test strip had been left to stand for 2 minutes. Positive test is indicated by two distinct red lines while a negative test is indicated by one red line which appears in the control region(C), with no apparent red line appears in the test region (T)(Moses *et al* ., 2010).

Statistical analysis: Descriptive statistics and chi square statistics at the 95% confidence interval were used to analyze the data. $P<0.05$ was considered significant. All statistical analyses were performed using statistical software start view version 4.5 (Abacus Concepts Inc. Piscataway, USA**)**

RESULTS

A total of seventy-three (73) venous blood specimens were investigated for Hepatitis B virus among male and female patients in Michael Okpara University of Agriculture,

(MOUAU) Clinic and Madonna Catholic Hospital Umuahia, Abia State (Table 1). The highest incidence rate of Hepatitis B virus was observed among those within the age range of 16-34 (52.1%), followed by ages 35-50 (20.5%), while the least was observed with the age >50 (11.0%). Among the patients investigated for Hepatitis B virus, female patients was the most prevalent with a positive percentage value of 47.7%. This was followed by the male patients with a positive percentage value of 44.8%. About 55.1% and 52.2% of the female and male patients showed negative test result respectively.

Table 2 show the percentage occurrence of Hepatitis B Surface Antigen among patients in Michael Okpara University of Agriculture, (MOUAU) Clinic and Madonna Catholic Hospital Umuahia, Abia State. The rate of Hepatitis B Surface Antigen was highest in patients between the age 16-34 years at a percentage prevalence of 19(55.9%). This was followed by ages between 35-50 years at a percentage value of 7(20.6%), while the least found in patients between 0-15 years at a percentage value of 3(8.8%).

Table 1: Age and gender distribution of hepatitis B surface antigen among patients investigated

Age range (Years)	Male			Female			
	N = 29	Positive	Negative	N = 44	Positive	Negative	Total (%)
0-15	5	1	4	7	2	5	12 (16.4)
16-34	15	8	7	23	11	12	38 (52.1)
35-50	6	2	4	9	5	4	15 (20.5)
>50	3	2	1	5	3	2	8 (11.0)
Total	29	13	16	44	21	23	73 (100)

P-value =0.46

Table 2: Percentage occurrence of hepatitis B surface antigen among patients investigated in relation to age.

Age range of patients	Male (N =29)	Female (N = 44)	Total
0-15	1(7.8)	2(9.5)	3(8.8)
16-34	8(61.4)	11(52.4)	19(55.9)
35-50	2(15.4)	5(23.8)	7(20.6)
>50	2(15.4)	3(14.3)	5(14.7)
Total	**13(100)**	**21(100)**	**34(100)**

P-value = 0.03

DISCUSSION

Hepatitis B virus infection is undeniably a serious public health issue worldwide, and it is a prominent cause of chronic hepatitis in low- and middle-income nations (Abbas and Siddiqui, 2011). In terms of disease endemicity, the globe has been divided into three sub-regions: high prevalence of hepatitis B infection among people of >8%, intermediate prevalence of 2–8%, and low prevalence of hepatitis B infection among populations of less than 2% (Abbas and Siddiqui, 2011). This study therefore determined the prevalence of Hepatitis B among patients in Michael Okpara University

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of Agriculture, (MOUAU) clinic and Madonna Catholic Hospital Umuahia, Abia State.

This study revealed that about 46.5% of the study participants were positive for hepatitis B surface antigen. This finding is in line with world- wide cut-off points for higher endemicity level in studies from developing countries (Bittaye *et al*., 2019). This shows that men and women's hepatitis B prevention and immunization status is low.

From this study, the prevalence of age distribution of Hepatitis B surface antigen among male and female patients revealed that the rate of Hepatitis B Surface Antigen was highest in patients between the age 16-34 years at a percentage prevalence of 19(55.9%). This was followed by ages between 35-50 years at a percentage value of 7(20.6%), while the least found in patients between 0-15 years at a percentage value of 3(8.8%). This prevalence is higher than most studies carried out in Nigeria where the prevalence ranged from 4.1% to 44.7% (Donbraye *et al.*, 2014). Some of these studies were done in a hospital setting and had fewer sample size compared to the present study. Ugwuja and Ugwu (2009) carried out their study on adolescent age group in south eastern Nigeria and they had a prevalence of 4.1%. For laboratory analysis, different screening approaches were applied, which might explain the disparities in prevalence rates (Musa *et al*., 2015). In this study, there was a strong link between increasing age and HBsAg positive. This is similar to that observed by Makuza *et al*., (2019) in Rwanda districts. This also backs with the theory that vertical transmission may not play a significant role in HBV infection spread in Nigeria. According to certain findings, horizontal transmission may have a bigger role in HBV infection than vertical transmission in several West African nations (WHO, 2017).

When comparing infection rates across age groups, it was found that infection rates were generally high in all age categories, while those aged 16-34 were the most likely to be infected, followed by those aged 35-50. This suggests that the discrepancy might be due to chance. Previous research, on the other hand, has established a strong link between age and infections (Khan *et al*., 2011). Given the sexual transmission of HBV, this might be explained by the increased sexual activity of people in these age groups. Although there aren't many research on this, adolescence is marked by youthful exuberance, sexual exploitation, bodily alterations (tattooing, piercing, etc.), and unsafe sexual behaviors, all of which are risk factors for HBV transmission (Yang *et al.*, 2015). Furthermore, teenagers in Nigeria do not openly discuss sex with their parents; instead, they turn to peers who are as unfamiliar with sexually related subjects and may participate in harmful behaviors. This shows that, independent of the national vaccination policy, further study is needed to completely understand the etiology of the high HBV prevalence in this group.

In the present study, the prevalence rate of Hepatitis B virus among the female and male patients investigated revealed that female patients were the most prevalent with a positive percentage value of 47.7% while the male patients had a positive percentage value of 44.8% with the difference not reaching statistical significance($p>0.05$). About 55.1% and 52.2% of the female and male patients showed negative test result respectively. Donbraye *et al* (2014) working in Osun state, south west, Nigeria also showed higher prevalence in female children than males but the difference similarly did not reach

significant level. Bukbuk *et al* (2005) working in northern Nigeria also showed no significant difference between males and females.For the factor of gender, the results were varied. Previous studies by Ochola *et al* (2013) showed that the prevalence was higher in males than in females, while Alavian *et al* (2012) in a study found that there was no association between gender and hepatitis B, which was similar to this present study. The result obtained in this study is in contrast to the findings of Ochola *et al* (2013) and Baba *et al* (2008) who found a significantly higher HBsAg prevalence in males than in females. The cause of this difference is unknown and might be due to chance.

The prevalence of HBV infection in this study was higher compared with previous studies in Jos (Sirisena *et al*, 2002) and other regions in Nigeria and the West African sub-region (Musa *et al*. 2015). The greater HBV prevalence in this study may be due to the comparatively large cross-sectional sample size from various tertiary care centers, whereas prior studies in Nigeria and Sub-Saharan Africa were non-analytic cross-sectional studies in single health institutions.The prevalence is higher than a similar study conducted in Bayara hospital, Bauchi State where a prevalence of 17.2% was documented (Ndako *et al*, 2012). It's possible that the discrepancy is related to the fact that it was done in a secondary facility in a city. A frequency of 8.2 percent was also found in FMC Yola, Adamawa State, in north eastern Nigeria (Olokoba *et al*, 2011). In the North-Central geopolitical zone, a prevalence of 12.3% was reported from Minna Niger State by Ndams *et al* (2008) and 11.0% was reported in Makurdi, Benue State by Mbaawauaga *et al*.(2008). In the south-western part of the country, a prevalence of 16.5% was reported in Osogbo, Osun State by Kolawole *et al*, (2012) and 8.3% in Ibadan by Chienye *et al* (2015). Southern states reported a prevalence of 12.5% in Edo State by Ugbebor *et al*, (2011). It is also higher than the 9.6–18.6% observed by Musa *et al*, (2015) in a country wide systematic review.

The majority of the studies cited above were conducted at the secondary and tertiary levels of care, with the majority of the participants being from urban or semi-urban areas, which is similar to our study, which was conducted in tertiary health care settings. The elevated frequency of HBV in this study compared to prior Nigerian research might be attributable to a lack of knowledge about the illness. However, the prevalence from our study is higher than the 4.3% found among pregnant women in Zaria, northwestern-Nigeria, 5.3% in Yenagoa, Bayelsa State (Buseri *et al*, 2010); 1.6% found in Iran (Afzali *et al*, 2015). The disparities might be due to variances in the study areas' general health-care status. The research's limitations include the fact that it was only done in an urban context and that all of the study locations provided tertiary care (no primary health centres were included). A disadvantage of using the HBsAg fast test kit alone was the known high rate of false-negative findings. Using enzyme-linked immunosorbent assays or HBV-DNA testing instead of the HBsAg test kit would have provided better sensitivity and specificity, as well as improved results, but would have been more expensive.

CONCLUSION

Based on the result obtained from this study, the prevalence rates of HBsAg among female and male (in and out) patients at in Michael Okpara University of Agriculture, (MOUAU) clinic and Madonna Catholic Hospital Umuahia, Abia State was high. Among the different age groups studied, the prevalence

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rate of HBsAg was more in persons between the ages 16-34. Such a high prevalence in an urban population questions the effectiveness of the Nigerian HBsAg vaccination programme. The importance of vaccination in the fight against hepatitis B cannot be overstated, emphasizing the necessity for universal immunization of all people in the age range studied, as well as the creation of policies to prevent mother-to-child transmission.

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