**PREVALENCE Of HEPATITIS B VIRUS AMONG STUDENTS Of NNAMDI AZIKIWE UNIVERSITY ATTENDING THE UNIVERSITY MEDICAL CENTRE, AWKA FOR MEDICAL EXAMINATIONS**

**Abstract**

**Background**: Hepatitis caused by Hepatitis B virus (HBV) is a vaccine preventable disease but still highly endemic in Nigeria. Unsafe practices among students have heightened the risk of HBV transmission.

**Aim:** The aim of the study was to conduct a cross-sectional study to determine the prevalence and associated factors of Hepatitis B virus infection amongst 250 students attending Nnamdi Azikiwe University Medical Center, Awka.

**Methods**: A total of 250 blood samples were collected from the students that consented to the study. The blood sample was spinned, and the plasma was used. The hepatitis B test strip kit (Spodex kitR) was used according to the manufacturer’s instructions. Structured questionnaire was used to obtain demographic characteristics of students. The data was entered in a Microsoft Excel data base. Data were statistically described in terms of frequency and percentages. A P value less than 0.5 was considered statistically significant.

**Results**: Of the 250 students, 2 (0.8%) tested positive. Analysis of the demographic data shows that infection was only found among female students, 2 (0.8%), age groups 16 –25,1 (0.4%) and 26--35 years,1 (0.4%) each. Also, the demographic data shows a prevalence among drug addict (1.08%). The only student with history of drug addiction was positive making the prevalence to be 100% and this was statistically significant at P=0.000.

**Conclusion**: The endemicity of Hepatitis B in the study population is a public health issue and calls for urgent action. This is because the infected students can be reservoirs for horizontal transmission. Furthermore, asymptomatic HBV infection can progress to chronic complications like liver cirrhosis and hepatocellular carcinoma. This suggests the need for routine screening, creating awareness, also administration of the vaccine.

**Keywords**: Hepatitis B Virus, Prevalence, Students, Questionnaire, Plasma

**Introduction**

The World Health Organization (WHO) estimates that over 2 billion individuals worldwide are infected with the Hepatitis B Virus (HBV) (WHO, 2016). Among these, approximately 240 million are chronic carriers, positioning HBV as the tenth leading cause of mortality globally. Each year, more than 600,000 individuals succumb to complications related to hepatitis (WHO, 2016). Sub-Saharan Africa (SSA) exhibits the highest prevalence of Hepatitis B, with an estimated 80 million carriers identified in 2016 (Patassi *et al.,* 2016), resulting in a prevalence rate between 5% and 10% within the adult population (WHO, 2016). Despite the considerable burden of HBV in SSA, access to screening and treatment remains severely limited and infrequent in this region (Jaquet *et al.,* 2016).

Nigeria significantly contributes to the global burden of chronic viral hepatitis, which is recognized as the seventh leading cause of death worldwide (WHO, 2017). It is estimated that 95% of individuals with chronic HBV infection, along with those with acute HBV infection, are unaware of their condition, thereby missing opportunities for clinical care, treatment, and interventions aimed at reducing further transmission (Spearman *et al.,* 2017). Furthermore, a substantial portion of the Nigerian population lacks awareness regarding the chronic complications associated with liver cirrhosis and primary liver cancer (National AIDS/STIs Control Program, 2016).

Among students, the risk of HBV transmission is heightened due to factors such as inadequate awareness, unsafe practices, and exposure to infected individuals (Debsikre´o *et al*., 2024). Given the significant public health concern posed by this widespread infection and the higher risk among student, this study aims to assess the prevalence of HBV among students of Nnamdi Azikiwe University in Awka who attended the university medical center for medical examinations and identify potential risk factors contributing to its spread.

**Methods**

**Study Area**

Sampling was carried out at the Medical Centre of Nnamdi Azikiwe University in Awka, which serves as a healthcare facility for the university community.

**Study Design**:

This descriptive cross-sectional study was carried out between June and August 2023. The inclusion criteria consisted of university students attending the University clinic for several complaints and gave their consent to participate.

**Study population**

The study was carried out among students at Nnamdi Azikiwe University who attended their medical examinations at the Nnamdi Azikiwe Medical Centre in Awka, Anambra State, South-Eastern Nigeria. The study population comprised a diverse group of participants of various age ranges and ethnic backgrounds. Data on demographics and other relevant information were gathered through a structured, standardized questionnaire.

**Sample Size Calculation**

Sample size = Sample size = Z2 x P(1-P)) / d2

Z = 1.96 at 5% type 1 error

P = expected proportion in population based on previous studies

d = absolute error or precision

In a previous study done in South-Eastern Nigeria (Odita *et al.* 2022), 7.6% of the participant tested sero-positive to HBsAg.

z = 1.96, p = 0.076, d = 0.05

n = 1.96 \* 0.076 \* (1 - 0.076) / 0.05

n = 0.2698 / 0.0025 = 107.909

n ≈ 108

The minimum sample size was calculated as 108 but 250 was used.

**Sample collection/preparation**

Two millilitre (2ml) of venous blood samples were collected from students that consented to the study, and a total of 250 samples were collected for the study. The patient's blood was collected by cleaning the site to be punctured with the spirit swab, tourniquet tied above the area and blood was collected and put into plain bottle. The serum collected and tested with the reagent strip. The result was read.

**HBV Testing**

The procedure followed the guidelines provided by the manufacturers of the Spodex kitR. The test strip is pre-coated with anti-HBV antibodies in the test line region. After allowing the pouch to reach room temperature, the test strip was removed. Plasma samples were then placed into a clean test tube, ensuring that the arrow on the test strip was directed towards the specimen for a duration of 10 to 15 seconds, without exceeding the maximum line indicated on the test strip. Subsequently, the strip was laid flat to allow the red lines to develop. The appearance of one red line in both the test and control regions indicates a positive result, while a single red line in the control region signifies a negative result.

**Statistical Analysis**

Data were statistically described in terms of frequency and percentages. The Chi-squared test was applied to analyse association of Hepatitis B infection with age, sex, awareness, vaccination, tattoos, sexual intercourse and drug addict. A P value less than 0.5 was considered statistically significant at 95% confidence interval.

**Result**

The sociodemographic features of the study participants are captured in **Table 1** where majority were female students (74.8%). Most of the participants (85.6%) fell within the age range of 16 – 25 years. **Table 2** reveals the prevalence rate of HBsAg among the students of which only 2 out of 250 participants (0.8%) tested positive for Hepatitis B virus (HBV) infection, while 248 (99.2%) were negative.

The prevalence of HBV infection in relation to the different demographic factors is seen in **Table 3**. It elucidates the prevalence among age groups, with HBV identified in participants aged 16-25 (0.005%) and 26-35(0.05%). In terms of gender, the highest prevalence (1.07%) was observed among the female participants. Their vaccination status revealed that 0.89% (n=2) of the unvaccinated individuals tested positive to HBV infection while all vaccinated individuals tested negative for Hepatitis B.

Furthermore, the prevalence of Hepatitis B with respect to its awareness among the students showed that individuals aware of this viral infection exhibited a prevalence rate of 1.6%. Also, the prevalence as concerning the use of tattoos and piercings revealed that individuals who tested positive did not have any tattoos or piercings while the prevalence in connection with drug addiction, showed a 0.40% prevalence and a significant association (p = 0.00) with HBV infection.

The prevalence rate based on marital status showed that single individuals accounted for the positive cases (0.86%). In terms of their sexual activity, individuals who tested positive reported no involvement in sexual intercourse. With the exception of the demographic feature based on use of tattoos and piercing that showed significant association (p=0.00) with HBV infection, there existed no significant correlation between the demographic factor and HBV infection among the students.

**Table 1: Demographic characteristics of the participants**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Description | No | % |
| **Sex** | Male | 63 | 25.2 |
| Female | 187 | 74.8 |
| **Age** | 16-25 | 214 | 85.6 |
| 26-35 | 21 | 8.4 |
| 36-45 | 13 | 5.2 |
| 46-55 | 1 | 0.4 |
| 56-65 | 1 | 0.4 |
| **Vaccinated** | Yes | 25 | 10 |
| No | 225 | 90 |
| **Awareness of HBsAg** | Yes | 125 | 50 |
| No | 125 | 50 |
| **Drug addiction** | Yes | 1 | 0.4 |
| No | 249 | 99.6 |
| **Use of tattoos** | Yes | 29 | 11.6 |
| No | 221 | 88.4 |
| **Marital status** | Single | 233 | 93.2 |
| Married | 17 | 6.8 |
| **Sexually active** | Yes | 30 | 12 |
| No | 220 | 88 |

**Table 2: Prevalence of Hepatitis B virus infection among students of Nnamdi Azikiwe University.**

|  |
| --- |
| Test Status Number Examined Percentage % p-value |

**Positive** 2 0.8 0.679

**Negative** . 248 99.2

**Total** 250 100

**Table 3: The relationship between the prevalence of HBVAg and the demographic factors tested**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Factor | Description | No. | Positive | Negative | % | p-value |
| Sex | Male | 63 | 0 | 63 | 0 | 0.410 |
| Female | 187 | 2 | 185 | 1.07 |
| Age | 16-25 | 214 | 1 | 213 | 0.47 | 0.334 |
| 26-35 | 21 | 1 | 20 | 4.76 |
| 36-45 | 13 | 0 | 13 | 0 |
| 46-55 | 1 | 0 | 1 | 0 |
| 56-65 | 1 | 0 | 1 | 0 |
| Vaccinated | Yes | 25 | 0 | 25 | 0 | 0.636 |
| No | 225 | 2 | 223 | 0.89 |
| Awareness of HBsAg | Yes | 125 | 2 | 123 | 1.60 | 0.156 |
| No | 125 | 0 | 125 | 0 |
| Drug addiction | Yes | 1 | 1 | 0 | 100 | 0.000 |
| No | 249 | 1 | 248 | 0.40 |
| Use of tattoos | Yes | 29 | 0 | 29 | 0 | 0.607 |
| No | 221 | 2 | 219 | 0.90 |
| Marital status | Single | 233 | 2 | 231 | 0.86 | 0.701 |
| Married | 17 | 0 | 17 | 0 |
| Sexually active | Yes | 30 | 0 | 30 | 0 | 0.6 |
| No | 220 | 2 | 218 | 0.90 |

**Discussion**

Hepatitis B virus (HBV) is a major cause of liver disease worldwide. Both acute and chronic HBV infections continue to represent important health problems in most developing countries (Alam *et al*., 2007).

The results of this study indicated that 0.8% of the sampled students tested positive for HBsAg. This prevalence is significantly lower than the 13.3% reported by Pennap *et al.,* (2010), 16.67% reported by Odinachi *et al.,* (2014), 7.6% reported by Odita *et al*., (2022) and 13.63% reported by Ndubuisi *et al.,* (2022) but a little comparable to 4.3% obtained in Uganda (Afolabi *et al*., 2024). One possible explanation for this discrepancy may be the limited sample size, as most of the students tested were new enrolees. The analysis of Hepatitis B virus (HBV) prevalence stratified by sex indicates a prevalence rate of 1.07% among females. This finding contrasts with the research conducted by Ahmad *et al.,* (2022), which demonstrated a higher susceptibility to Hepatitis B infection among males. Similarly, a study by Ekouevi *et al.,* (2017) reported a male prevalence of 20.5%, compared to just 0.5% in females. This discrepancy may be attributed to a greater willingness among female students to engage in the study, leading to a lower participation rate among male students.

Hepatitis B virus (HBV) infection prevalence with respect to age bracket indicated a prevalence rate of 0.47% and 4.76% among individuals aged 16 to 25 years and those aged 26 to 35 years respectively, which aligns with findings reported by Alter (2003) and Ndubuisi *et al.,* (2022) who reported a prevalence rate of 13.63% among students within the age bracket of 21-25 years. This pattern may be attributed to increased sexual transmission within these age groups, although the results were not statistically significant (P = 0.334).

The vaccination status of the study participants was found to be 0%, which contrasts with the finding recorded by Sannathimmapp *et al.,* (2019) of 0.3%. Among those who tested positive, 0.8% were not vaccinated. There was no statistically significant association, with a P-value of 0.636, which may be attributed to differences in population size.

This study found that only 0.89% of participants were aware of their Hepatitis B virus (HBV) infection status based on their knowledge of the HBsAg test. This contrasts with a study by Kazmi *et al.,* (2022), which reported significant improvements in knowledge after awareness sessions. Initially, according to their report, only 32% of participants answered questions correctly, but this increased to 88.5% after the awareness sessions.

Furthermore, the prevalence of HBV infection associated with drug addictions was reported at 0.4%, which was statistically significant (P = 0.000). In the study by Kazmi *et al.,* (2022), a prevalence of 100% was noted. However, it was not specified whether individuals using injection drugs were doing so as part of illegal drug use. This risk factor may be related to the reuse of injection needles.

Additionally, the prevalence of HBV infection based on tattoos and piercings was noted to be 0%, with no positive results. This finding contrasts sharply with the study by Alter (2003), which reported a prevalence of 62.5%. Such differences may be influenced by the familial background of the students, most of whom are from the southeastern region of Nigeria.

The distribution of Hepatitis B virus (HBV) infection prevalence based on sexual activity contrasts with the findings of Henry (2021), which reported a prevalence of 50% among sexually active individuals. Other studies have also demonstrated a higher prevalence of HBV infection among sexually active populations. However, the present study found a prevalence of 0.8% among those who were not sexually active, with no statistically significant association (P = 0.600). This discrepancy may be attributed to the possibility that some students did not provide accurate information about their sexual activity.

**Conclusion**: while the overall prevalence of Hepatitis B was low, significant associations were identified particularly concerning drug addiction, in contrast to other demographic factors for which no significant associations were observed.

Consent: Informed consent was obtained from all participants involved in the study.

Ethical approval

Ethical approval was obtained from the medical centre affiliated with Nnamdi Azikiwe University (UNIZIK), Awka.

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1.

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3.

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