

# PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG STUDENTS OF KWARA STATE COLLEGE OF HEALTH TECHNOLOGY, OFFA, NIGERIA: A CROSS-SECTIONAL STUDY COLLEGE OF HEALTH TECHNOLOGY, OFFA

\*Dr Raufu Alabi Aliyu<sup>1</sup>, and Mathew Folaranmi Olaniyan<sup>2</sup>

<sup>1</sup>Department of Medical Laboratory Science, Kwara State College of Health Technology, Offa, Nigeria.

<sup>2</sup>Department of Medical Laboratory Science, Kwara State College of Health Technology, Offa, Nigeria.

Email: [aliyurauf@yahoo.com](mailto:aliyurauf@yahoo.com)/

DOI: <https://doi.org/10.5281/zenodo.16793004>

## Abstract

**Background:** Hepatitis B virus (HBV) infection remains a significant global public health concern, particularly in sub-Saharan Africa where it is endemic. This study aimed to determine the prevalence of Hepatitis B surface antigen (HBsAg) among students of Kwara State College of Health Technology, Offa, Nigeria.

**Methods:** A cross-sectional study was conducted between July and August 2016 involving 100 randomly selected students from various departments of the college. Blood samples were collected and screened for HBsAg using a rapid chromatographic immunoassay. Data on age, sex, and department were recorded and analyzed using descriptive statistics.

**Results:** The overall seroprevalence of HBsAg was 7% (n=7). Females showed a higher prevalence (8.2%) compared to males (5.13%). Students aged 18-21 years had a higher prevalence rate (12.5%) than those aged 22-25 years (4%). No HBsAg positivity was detected in students above 26 years. Analysis by department revealed the highest prevalence in Environmental Health department (27.1%), followed by Public Health and Community Health departments (9.1% each), with Dental Health and Nutrition departments each showing 8.3% prevalence.

**Conclusion:** This study demonstrates a concerning prevalence of HBsAg among college students, particularly in younger females and students of Environmental Health. The findings highlight the need for targeted HBV screening, vaccination programs, and education about preventive measures within tertiary institutions in Nigeria.

**Keywords:** Hepatitis B virus, HBsAg, prevalence, students, Nigeria

## Introduction

Hepatitis B virus (HBV) infection represents a major global health challenge, affecting approximately 2 billion people worldwide, with 350 million suffering from chronic infection (WHO, 2022). The World Health

Organization considers HBV second only to tobacco among liver carcinogens. In sub-Saharan Africa and East Asia, approximately 10% of the population is chronically infected with HBV, with significant risk of developing complications such as liver cirrhosis and hepatocellular carcinoma (Spearman et al., 2017).

HBV is a DNA virus belonging to the Hepadnaviridae family that can cause both acute and chronic liver infections. Transmission occurs through contact with infected blood or body fluids, with perinatal, horizontal, and sexual transmission being the predominant routes (Ott et al., 2012). In Africa, epidemiological studies have shown that HBV infection commonly occurs during childhood, resulting in an increased tendency toward chronicity (Lemoine et al., 2013).

The clinical manifestations of HBV infection range from asymptomatic carrier state to fulminant hepatitis. After an incubation period, patients typically present with prodromal symptoms including chills, headache, nausea, and vomiting, which may precede jaundice. While most acute HBV infections resolve spontaneously, chronically infected individuals have elevated risks of developing cirrhosis and hepatocellular carcinoma (Trépo et al., 2014).

Diagnosis of HBV infection is primarily confirmed through serological testing, with HBsAg being the most important marker. HBsAg appears during the incubation period and persists during acute disease, disappearing after one to two months following jaundice in resolving infections. Persistence of HBsAg for more than 6 months indicates a carrier state and risk for chronic hepatitis (Liaw & Chu, 2009).

Despite the availability of an effective vaccine against HBV since 1982, and its integration into the Expanded Programme on Immunization (EPI) in many countries, HBV infection continues to be a significant public health issue in Nigeria. Various studies have reported prevalence rates ranging from 2.4% to 18.4% across different population groups in Nigeria (Musa et al., 2015).

College students represent a demographic group that may be at higher risk for HBV infection due to lifestyle factors including potential unsafe sexual practices, sharing of personal items, and participation in activities with risk of blood exposure. Understanding the epidemiology of HBV infection among this population is crucial for developing targeted preventive strategies (Eni et al., 2018).

The present study aimed to determine the prevalence of HBsAg among students of Kwara State College of Health Technology, Offa, Nigeria, and to identify demographic factors associated with HBV infection in this population.

## **Materials and Methods**

### **Study Design and Population**

A cross-sectional study was conducted between July and August 2016 at Kwara State College of Health Technology, Offa, Nigeria. The college is located in Offa, the second largest town in Kwara State with a population of approximately 90,000 inhabitants. The college has about ten departments with approximately 10,000 students.

A total of 100 students were randomly selected from various departments of the college. The study population comprised 39 males and 61 females, with ages ranging from 18 to 28 years. The distribution of participants

across departments was as follows: Medical Laboratory Science (n=11), Public Health (n=11), Dental Health (n=12), Community Health (n=11), Health Education (n=11), Environmental Health (n=11), Pharmacy (n=10), Human Nutrition (n=12), and Health Information (n=11).

### **Ethical Considerations**

Ethical approval was obtained from the Institutional Review Board of Kwara State College of Health Technology. Informed consent was obtained from all participants prior to sample collection. Confidentiality of all personal and medical information was maintained throughout the study.

### **Sample Collection and Processing**

Venous blood samples (approximately 3ml) were collected using standard venipuncture technique. Blood samples were collected in plain bottles and allowed to clot. Sera were separated by centrifugation and stored appropriately until analysis.

### **Laboratory Analysis**

Serum samples were screened for HBsAg using a commercially available rapid chromatographic immunoassay kit according to the manufacturer's instructions. The principle of the test is based on the reaction between specimen and colloidal gold particles labeled with specific antibodies against HBsAg. A positive result is indicated by the development of a pink-colored band in the test region in addition to the control band, while a negative result shows only the control band.

Quality control measures included checking expiration dates of test kits, ensuring water-free conditions, avoiding sample mix-ups, and running positive and negative controls with each batch of tests.

### **Data Analysis**

Data were analyzed using simple descriptive statistics. The prevalence of HBsAg was calculated as the percentage of positive cases among the total number of students tested. Stratified analysis was performed to determine the distribution of HBsAg positivity by age, sex, and department.

## **Results**

### **Overall Prevalence of HBsAg**

Of the 100 students screened, 7 tested positive for HBsAg, giving an overall seroprevalence of 7%.

### **Prevalence of HBsAg by Sex**

Among the 39 males screened, 2 (5.13%) were positive for HBsAg, while 5 of the 61 females (8.2%) tested positive (Figure 1). The data indicated a higher seroprevalence among female students compared to their male counterparts.

### **Prevalence of HBsAg by Age Group**

The age-specific distribution of HBsAg showed that students in the age group 18-21 years had the highest prevalence rate of 12.5% (5/40), followed by those in the age group 22-25 years with a prevalence of 4% (2/50). No positive cases were detected among students aged 26 years and above (0/10) (Figure 2).

### **Prevalence of HBsAg by Department**

The departmental distribution of HBsAg positivity revealed that students from the Environmental Health department had the highest prevalence at 27.1% (3/11), followed by Public Health and Community Health departments, each with 9.1% (1/11). Dental Health and Nutrition departments each had a prevalence of 8.3% (1/12). No positive cases were detected among students from Medical Laboratory Science, Health Education, Pharmacy, and Health Information departments (Figure 3).

### **Discussion**

This study reports an overall HBsAg seroprevalence of 7% among students of Kwara State College of Health Technology, Offa, Nigeria. This finding falls within the range of HBsAg prevalence reported in previous studies conducted in Nigeria, which varies between 2% and 20% depending on the population and geographical region (Musa et al., 2015; Eke et al., 2011).

According to the World Health Organization classification of HBV endemicity, a prevalence of 7% places this population in the intermediate-high endemicity category (5-7%), which is consistent with the general classification of Nigeria as an HBV endemic country (WHO, 2022). The result is comparable to findings from similar studies among college students in Nigeria, such as the 6.2% prevalence reported by Oluboyo et al. (2014) among students in Ekiti State and 8.3% reported by Ndako et al. (2013) among students in Ibadan.

The higher prevalence of HBsAg among female students (8.2%) compared to male students (5.13%) observed in this study contrasts with several previous studies that reported higher prevalence among males (Eke et al., 2011; Ndako et al., 2013). This unusual finding may be attributed to the unequal distribution of participants by sex in our study (61 females vs. 39 males) or could reflect local epidemiological patterns. Potential factors contributing to higher female prevalence might include higher rates of body enhancement procedures such as manicure/pedicure with shared instruments, or other gender-specific risk behaviors not assessed in this study.

The age-specific analysis revealed that younger students (18-21 years) had a higher prevalence (12.5%) of HBsAg compared to older students (4% in the 22-25 age group and 0% in those >26 years). This finding aligns with other studies that have reported higher HBV infection rates among younger adults in Nigeria (Musa et al., 2015). This could be attributed to lower vaccination coverage among younger students, as the national HBV vaccination program in Nigeria has faced implementation challenges, or to behavioral factors such as higher engagement in risk behaviors among younger students.

The departmental distribution of HBsAg positivity showed marked variation, with the Environmental Health department having the highest prevalence (27.1%). This striking difference might be related to specific exposures during practical training, such as handling waste materials or engagement in community-based fieldwork where students might be exposed to contaminated materials. The absence of positive cases in departments such as Medical Laboratory Science, despite potential occupational exposure to blood and body fluids, might suggest better awareness and adherence to standard precautions among these students due to their specialized training.

Several limitations should be considered when interpreting the results of this study. The relatively small sample size (n=100) may not be fully representative of the entire student population of approximately 10,000.

Additionally, the study relied solely on HBsAg detection without assessing other serological markers of HBV infection such as anti-HBc, anti-HBs, or HBeAg, which would have provided a more comprehensive understanding of the infection status. Furthermore, the study did not evaluate risk factors associated with HBV infection, limiting our ability to explain the observed prevalence patterns.

Despite these limitations, our findings highlight a significant prevalence of HBsAg among college students, particularly among younger females and students in specific departments, warranting targeted interventions.

### **Conclusion**

This study revealed a 7% prevalence of HBsAg among students of Kwara State College of Health Technology, Offa, Nigeria, with higher rates observed among females, younger students (18-21 years), and students in the Environmental Health department. These findings underscore the need for comprehensive prevention strategies, including screening, vaccination, and education programs specifically targeting high-risk groups within the college population.

### **Recommendations**

Based on the findings of this study, we recommend:

1. Implementation of routine HBV screening for all new and continuing students in tertiary institutions in Nigeria to identify infected individuals for appropriate management and to prevent transmission.
2. Strengthening of HBV vaccination programs within educational institutions, with particular focus on departments with higher prevalence rates.
3. Development of educational campaigns to increase awareness about HBV transmission, prevention, and the importance of vaccination, especially targeting younger students and departments with higher prevalence.
4. Enhancement of infection control practices during practical training sessions, particularly for students in Environmental Health and other departments with potential exposure to blood and body fluids.
5. Conducting larger, multi-center studies with more comprehensive serological testing and risk factor assessment to better understand the epidemiology of HBV infection among Nigerian college students.

### **Acknowledgments**

The authors thank the management and students of Kwara State College of Health Technology, Offa, for their cooperation and participation in this study.

### **Conflicts of Interest**

The authors declare no conflicts of interest.

### **References**

- Eke, A. C., Eke, U. A., Okafor, C. I., Ezebialu, I. U., & Ogbuagu, C. (2011). Prevalence, correlates and pattern of hepatitis B surface antigen in a low resource setting. *Virology Journal*, 8, 12. <https://doi.org/10.1186/1743-422X-8-12>

- Eni, A. O., Soluade, M. G., Oshamika, O. O., Efekemo, O. P., Igwe, T. T., & Onile, O. S. (2018). Seroprevalence of Hepatitis B virus and HIV among healthy young adults in South-west Nigeria. *The Pan African Medical Journal*, 30, 69. <https://doi.org/10.11604/pamj.2018.30.69.14579>
- Lemoine, M., Nayagam, S., & Thursz, M. (2013). Viral hepatitis in resource-limited countries and access to antiviral therapies: current and future challenges. *Future Virology*, 8(4), 371-380. <https://doi.org/10.2217/fvl.13.11>
- Liaw, Y. F., & Chu, C. M. (2009). Hepatitis B virus infection. *The Lancet*, 373(9663), 582-592. [https://doi.org/10.1016/S0140-6736\(09\)60207-5](https://doi.org/10.1016/S0140-6736(09)60207-5)
- Musa, B. M., Bussell, S., Borodo, M. M., Samaila, A. A., & Femi, O. L. (2015). Prevalence of hepatitis B virus infection in Nigeria, 2000-2013: a systematic review and meta-analysis. *Nigerian Journal of Clinical Practice*, 18(2), 163-172. <https://doi.org/10.4103/1119-3077.151035>
- Ndako, J. A., Nwankiti, O. O., Echeonwu, G. O., Junaid, S. A., Anaele, O., & Anthony, T. J. (2013). Studies on prevalence and risk factors for hepatitis B surface antigen among secondary school students in North-central, Nigeria. *Sierra Leone Journal of Biomedical Research*, 5(1), 5-12.
- Oluboyo, B. O., Enitan, S. S., Adeleke, G., & Oluboyo, A. O. (2014). Prevalence of Hepatitis B and C viral infections among medical students in Ekiti State University, Ado-Ekiti, Nigeria. *International Journal of Current Microbiology and Applied Sciences*, 3(10), 834-845.
- Ott, J. J., Stevens, G. A., Groeger, J., & Wiersma, S. T. (2012). Global epidemiology of hepatitis B virus infection: new estimates of age-specific HBsAg seroprevalence and endemicity. *Vaccine*, 30(12), 2212-2219. <https://doi.org/10.1016/j.vaccine.2011.12.116>
- Spearman, C. W., Afihene, M., Ally, R., Apica, B., Awuku, Y., Cunha, L., Dusheiko, G., Gogela, N., Kassianides, C., Kew, M., Lam, P., Lesi, O., Lohouès-Kouacou, M. J., Mbaye, P. S., Musabeyezu, E., Musau, B., Ojo, O., Rwegasha, J., Scholz, B., ... Gastroenterology and Hepatology Association of sub-Saharan Africa (GHASSA). (2017). Hepatitis B in sub-Saharan Africa: strategies to achieve the 2030 elimination targets. *The Lancet Gastroenterology & Hepatology*, 2(12), 900-909. [https://doi.org/10.1016/S2468-1253\(17\)30295-9](https://doi.org/10.1016/S2468-1253(17)30295-9)
- Trépo, C., Chan, H. L., & Lok, A. (2014). Hepatitis B virus infection. *The Lancet*, 384(9959), 2053-2063. [https://doi.org/10.1016/S0140-6736\(14\)60220-8](https://doi.org/10.1016/S0140-6736(14)60220-8)

**American Journal of Medical and Physical Education**

Vol.10, Issue 4; July-August 2025;

ISSN: 2994-0524

Impact Factor: 7.06

1252 Columbia Rd NW, Washington DC, United States

<https://topjournals.org/index.php/AJMPE>; mail: [topacademicjournals@gmail.com](mailto:topacademicjournals@gmail.com)



World Health Organization. (2022). Hepatitis B. <https://www.who.int/news-room/fact-sheets/detail/hepatitis-b>