

Sero-Prevalence of Hepatitis B Virus amongst Food Sellers in Benue State University Campus Makurdi

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ABSTRACT: Hepatitis B Virus infection is a serious global public health problem and is highly endemic in Africa, Nigeria inclusive. Globally over 2 billion people are infected with the virus and over 350 million have chronic infections. Food sellers are a neglected group of people who are rarely tested in the region. The food sellers feed majority of the student population, workers and even staff on Benue State University Campus. This signifies the importance of this category of people in the society when it comes to health. It is on this premise that this study is designed to investigate the seroprevalence of Hepatitis B Virus among food sellers in the designated location. An overall prevalence of 4.50 (9/156) was observed in this research. The overall prevalence rate was however not statistically significant ($p=0.013$). Females were the only group in this research with the virus, with prevalence of 5.80. People from age group 26-30 recorded the highest prevalence of infection (11.6%) while single women were also seen to be more prevalent with the infection (5.20%). Other socio-demographic factors such as level of education ($p=0.394$) and location ($p=0.541$) were found to be of no statistical significance to this research. Risk factors such as body piercings ($p=0.661$), immunization ($p=0.131$) and blood transfusion ($p=0.334$) were also considered. The study was seen to differ from other research works in the region which recorded 12% and 30% rates respectively. It is recommended that definite preventive measures be adopted by food vendors to reduce spread of the infection.

KEYWORDS: Hepatitis B, Endemic, Prevalence, Food, vendors, Benue State.

I. INTRODUCTION

Hepatitis B virus (HBV) infection is a serious global public health problem and is endemic in Africa, including Nigeria with the viral antigen initially called Australian antigen ([1], [2], [3]). HBV is the prototype member of the Hepadnaviridae (hepatotropic DNA virus) family with virions which are double-stranded particles, measuring 40 to 42 nm in diameter with an outer lipoprotein envelope that contains three related envelope glycoproteins (or surface anti-gens) [4][5]. The infection can be acute or chronic, while adults that acquire acute infection usually recover or can be managed by supportive therapy; the chronic type is ultimately fatal [6]. Diagnosis of HBV infection is usually through serological and virological markers. Hepatitis B surface antigen (HBsAg) is the hallmark of HBV infection and is the first serological marker to appear in acute HBV infection, and persistence of HBsAg for more than 6 months suggests chronic HBV infection [7].

Globally, over 2 billion people are infected with the virus and over 350 million have chronic infection [8]. Infection with this virus does not only leads to acute illnesses, but chronic illnesses like liver cirrhosis and hepatocellular carcinoma which accounts for more than 1 million deaths globally [8][9]. The prevalence of hepatitis B virus infection is relatively high in Africa, having the second highest number of chronically HBV-infected individuals [10].

Hepatitis B is a major global health problem; it is a potentially life-threatening liver infection caused by Hepatitis B virus (HBV). Hepatitis B virus is 50 to 100 times more infectious than HIV. Recent statistics indicate that not less than 23 million Nigerians are estimated to be infected with the Hepatitis B virus (HBV), making

Nigeria one of the countries with the highest incidence of HBV infection in the world [11]. Consequently, the global disease burden of HBV was considered substantial due to the high HBV related morbidity and mortality. Approximately 5.0% of the world's populations were reportedly seropositive for hepatitis B surface antigen (HBsAg). The global burden of hepatitis B remains enormous, due largely to lack of universal HBV vaccination [12].

Nigeria is classified among the group of countries endemic for HBV infection with a current infected population of 18 million [13]. Despite the existence of a safe and effective vaccine, Nigeria has remained a hyper-endemic area for HBV infection, with an estimated 12% of the population being chronic carriers [14]. Sero-prevalence studies on HBsAg in Nigeria have shown that the prevalence of the infection in pregnant women range from 2 to 15.8% ([13], [15], [16], [17]).

Hepatitis B (HBV) affects 240 million people globally, with the highest prevalence in East Asia and sub-Saharan Africa (SSA) and it is the 10th leading cause of death worldwide. Approximately 686,000 deaths per year are caused by chronic hepatitis and hepatocellular carcinoma. Sub-Saharan Africa also has the highest number of people living with HIV (PLWHIV) globally: 70% of the 36.7 million [12].

Hepatitis B virus is very infectious, and can easily be contracted at a much faster rate than HIV. Hepatitis B is becoming very common in most places despite the fact that vaccines are administered to people to help reduce the harm that could result from the virus. Hepatitis is easily transmitted among students at various levels, due to the nature of their environment and the kind of activities they engage in.

Food sellers form a major segment of the Benue State University labour market. The market is characterized by the presence of different sales personnel engaging in different kinds of trade. The food sellers feed majority of the student population, workers and even staff on Benue State University Campus. This signifies the importance of this category of people when it comes to health and livelihood of the Benue State University population since infections and diseases might easily be transmitted from food sellers to customers if the

right hygienic practices are not adopted. Its is on this premise that this study is designed to investigate the seroprevalence of Hepatitis B virus among food sellers in Benue State University Makurdi campus.

II. MATERIALS AND METHODS

2.1 STUDY AREA

This study was carried out at Benue State University. The University is situated in Makurdi, the capital of Benue State, Nigeria. The city is located in central Nigeria along the Benue River, on latitude 07043'N and Longitude 08035'E and holds the base for the Nigerian Air Force. Makurdi lies on the south bank of the Benue River. Founded about 1927 when the railroad from Portharcourt was extended to Jos and Kaduna, Makurdi has rapidly developed into a transportation and market center. As of 2007, Makurdi had an estimated population of 500,797 [10].

The climatic condition in Makurdi is influenced by two air masses: the warm, moist southwesterly air mass, and the warm, dry north-easterly air mass. The mean annual rainfall in Makurdi is about 1,290mm. The temperature in Makurdi is, however, generally high throughout the year, with February and March as the hottest months. The temperature in Makurdi varies from a daily of 400C and a maximum of 22.50C.

Makurdi and its environs are built on "Makurdi sand-stone" The sandstone is also overlain by shale units in some places especially the low-lying areas of Wadata. The soil here ranges from fine sand on the riverside to silt sand and even clay in some parts of the town. Thus, in the rainy season, a slight rain only can render the untarred streets muddy [10].

Benue State University is one of the first state Universities in North Central Nigeria and the only state-owned University in Benue State. It is located along Gboko-Makurdi road and is close to the famous Tactical Headquarters of the Nigerian Airforce Base in Makurdi. The University offers a host of courses and awards degrees ranging from Diploma to Doctor of Philosophy Degrees (Ph.D.). Millions of unemployed Americans could be in for a tax shock by next year.

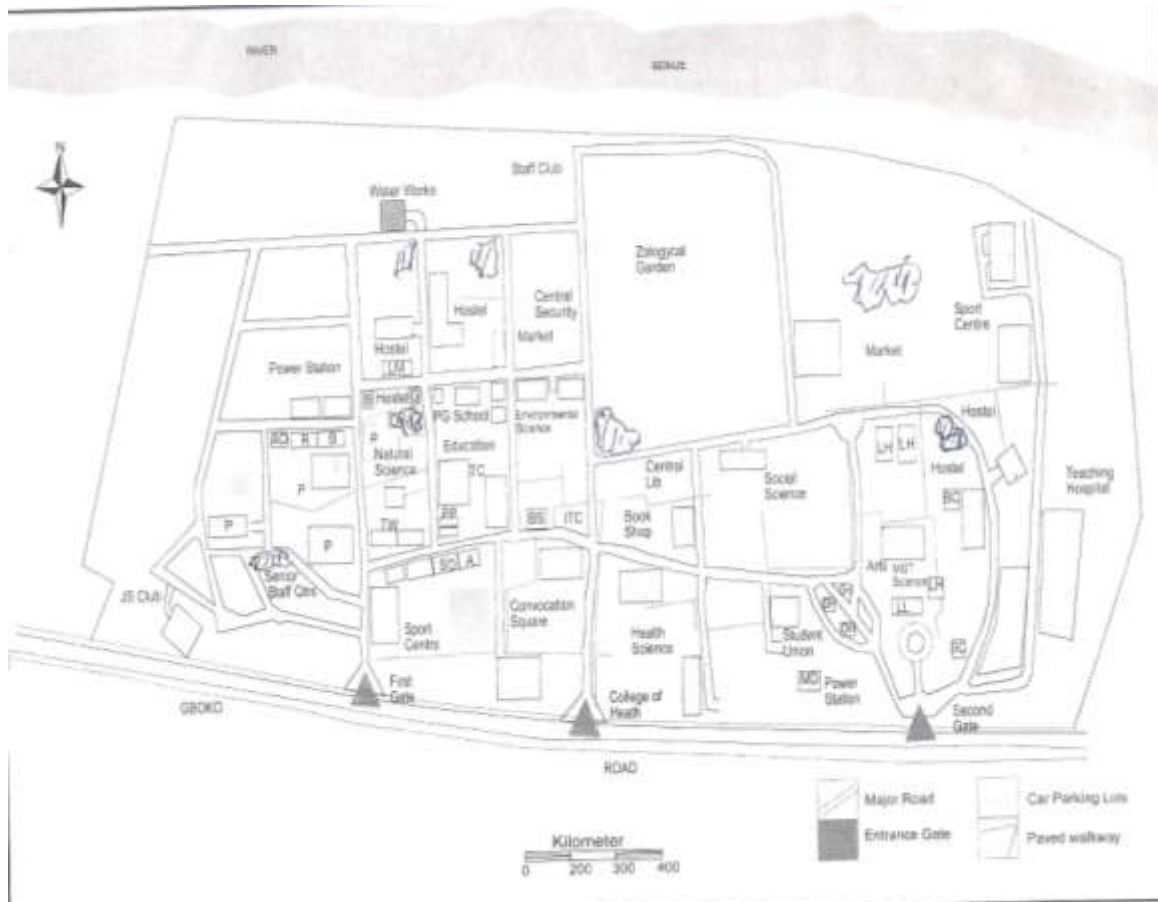


Fig. 1. Map of Benue State University Makurdi

2.2 SAMPLING

A total of 200 blood samples were randomly collected from food vendors selling food within and around Benue State University campus for examination during the study period. The sample size used for the study was determined using the formula below [18].

$$n = \frac{z^2 p(1 - p)}{d^2}$$

Where

- n = sample size
 - z = statistic for a level of confidence, in this case the level of confidence was 95% (1.96)
 - p = expected prevalence and
 - d = precision at 5% (0.05)
- Thus,

$$n = \frac{1.96^2 \times 0.16(1 - 0.16)}{0.05^2}$$

$$n = \frac{3.84 \times 0.16(0.84)}{0.05^2}$$

$$n = 206$$

The standard operating procedure (SOP) for the collection of blood samples was utilized to obtain blood from the participants. The samples collected were promptly transported to the Benue State University Biology Laboratory for further analysis.

III. RESULTS

Table 1 represents the prevalence of Hepatitis B in relation to gender among food sellers in the designated area. The detailed contamination statistics is given by figure 1. It shows the different bacteria as they occur on the door knobs of various faculties. Table 2 presents the total viable count of bacteria isolated across the three locations, while table 3 depicts the biochemical characteristic of the isolated organisms.

Table 1. Prevalence of Hepatitis B in Relation to Gender Among Food Sellers in Benue State University Makurdi Metropolis

Gender	Total Number Tested	Prevalence (%)
Male	44	0 (0.0)
Female	156	9 (5.80)
Total	200	9 (4.50)

$X^2 = 2.65, P = 0.103, DF = 1$

Table 2. Total Viable Count of Bacteria Isolates Across the Three Locations

Age (Years)	Total Number Tested	Prevalence (%)
10-15	7	0 (0.00)
16-20	38	1 (2.60)
21-25	46	3 (6.50)
26-30	43	5 (11.6)
31-35	14	0 (0.00)
36-40	21	0 (0.00)
40 and Above	31	0 (0.00)
Total	200	9 (4.50)

$X^2 = 9.27, P = 0.159, df = 6$

Table 3. Prevalence of Hepatitis B in Relation To Marital Status Among Food Sellers in Benue State University Makurdi

Relationship Status	Total Number Tested	Prevalence (%)
Single	115	6 (5.20)
Married	83	3 (3.60)
Divorced	2	0 (0.00)
Total	200	9 (4.50)

$X^2 = 0.383, P = 0.830, DF = 2$

Table 4. Prevalence of Hepatitis B in Relation To Education among Food Sellers in Benue State University Makurdi

Level of Education	Total Number Tested	Prevalence (%)
Non-formal	11	1(9.1)
Primary	26	0(0.00)
Secondary	90	3(3.3)
Tertiary	73	5(6.8)
Total	200	9(4.50)

$X^2=2.987$, $P=0.394$, $DF=3$

Table 5. Prevalence of Hepatitis B in Relation to Residence Among Food Sellers in Benue State University Makurdi

Residence	Total Number Tested	Prevalence (%)
Wurukum	129	8(6.20)
High Level	22	0(0.00)
North Bank	19	0(0.00)
Kanshio	12	1(8.30)
Modern Market	11	0(0.00)
Wadata	7	0(0.00)
Total	200	9(4.50)

$X^2=4.06$, $P=0.541$, $DF=5$

Table 6. Prevalence of Hepatitis B in Relation to Possible Risk Factors Among Food Sellers in Benue State University Makurdi

Risk Factor	Total Number Tested	Prevalence (%)	Pvalue
Piercing			
Yes	4	0(0.00)	0.661
No	196	9(4.60)	
Immunization			
Yes	39	0(0.00)	0.131
No	161	9(5.6)	
Blood transfusion			
Yes	18	0(0.00)	0.334
No	182	9(4.90)	
Alcoholism			
Don't take	114	7(6.10)	
Daily	18	0(0.00)	
Weekly	43	2(4.70)	
Monthly	25	0(0.00)	

IV. DISCUSSION

This study which examined the seroprevalence of hepatitis B among food sellers in Benue State revealed an overall prevalence of Hepatitis B to be 4.50%. This prevalence rate was formed by only females who recorded an individual prevalence rate of 5.80% when compared to males with zero prevalence as shown in table 1. An overall prevalence of 4.50 recorded in this study is lower than what was previously recorded by [19] in their study on prevalence of Hepatitis B among food vendors in Wurukum, Makurdi, Benue State. In his study, he reported an overall prevalence of 10.8%. The finding of this study also differed from the reports of [20] who reported a prevalence rate of 30.0% in their study on Hepatitis B in Otukpo, Benue State, Nigeria and 12% prevalence reported by [10] in Benue State.

Differences in prevalence rates with respect to sex as observed in this study is in line with [19] who recorded that there was difference in the occurrence of hepatitis B among food sellers in Makurdi. The findings of [19] however differed from this study in that their study recorded more hepatitis B positive males than females. The findings of this study also differ from the reports of [21] who recorded higher prevalence rates in males than females. Chi-square analysis however presented that; there was no significant relationship between sex and prevalence of hepatitis B infection. Differences observed between the results of this study and that of [19] might be attributed to the differences in study population since Benue State University food sellers are mostly females who are not adequately equipped with knowledge on hepatitis B unlike Wurukum market which is dominated by mixed crowds with vast people from all shades of life.

Highest prevalence of infections was recorded by age group 21-25. This age group is characterized by people in the prime of their youth, energy and ability to move around in search of basic needs of life without stringent restrictions. This may be attributed in part to the high prevalence recorded in this age group. Age group above 30 years were however free of hepatitis B infection as shown in table 2. This is an indication to the fact that hepatitis infection among Benue State University food sellers is lowest amongst children and Adults above 30years. This finding is in agreement with [19] who reported age group 20-29 to present higher prevalence rates for hepatitis B. It is also similar to [21] who reported that the young adult had higher prevalence than older age group. According to the reports of [19], high prevalence reported in the most dominant age

group for hepatitis in this study poses a great risk to the people as this age group constitutes the main work force. Despite the differences recorded in prevalence rates of the various age groups examined, chi-square analysis shows that there was no significant association between age and infection rates.

Single persons recorded higher prevalence rates than other categories of people. This is representative in the 5.20% rate of hepatitis B infection recorded by this age group in comparison with the 3.60% recorded by married people and zero percent prevalence recorded by divorced food vendors. There was also no significant statistical relationship between marital status and prevalence of hepatitis B infection in Benue State University, Makurdi as $P > 0.05$ (table 3).

In terms of Education, those who have tertiary forms of Education recorded the highest prevalence of infection for Hepatitis B. This finding differs markedly from the reports of [19] who reported that prevalence of hepatitis B infection is highest amongst those with no formal education. Statistical analysis however shows that there is no difference between infection with Hepatitis B and Educational background since $P > 0.05$ (table 4).

Locational differences occurred between food sellers on Benue State University campus in relation to prevalence of Hepatitis B infection. It was observed from the study that Wurukum had the highest prevalence followed by Kanshio; the rest having a zero prevalence. There was also no significant relationship between location and prevalence of hepatitis amongst Food sellers on Benue State University campus as $P > 0.05$.

Various possible factors associated with hepatitis B infection were highlighted in this study. The findings however show that there was no significant difference between risk factors of piercings, immunization, Blood transfusion and alcoholism as $P > 0.05$ for all the risk factors examined (table 5). This study therefore points to the fact that consumption of alcohol, piercing of body parts, blood transfusion or alcoholism does not affect the rate of infection with hepatitis B virus.

V. CONCLUSION

This study revealed an overall prevalence hepatitis B amongst food sellers in Benue State University, Makurdi to be 4.9% which is relatively low when compared with results from retrospective studies. It also reveals that highest prevalence of Hepatitis B virus was observed among females than males indicating the dangers

associated with transference of this infection to their families if right hygienic conditions are not employed and implemented.

Also, despite the fact that the prevalence of hepatitis B virus is low when compared to results from previous studies, the risk of infection is very high and spread of the virus in the future is possible if the students, staffs and workers who buy food from these food sellers are exposed to source of infections.

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