Original Research Article

PREVALENCE OF HEPATITIS B VIRAL INFECTION AND ASSOCIATED RISK FACTORS AMONG RESIDENTS OF GOESA COMMUNITY, SHENDAM LGC, PLATEAU STATE.

ABSTRACT

Aim: To assess the prevalence of Hepatitis B viral infection and the associated risk factors among residents of Goesa community, Shendam Local Government Area, Plateau state, Nigeria

Study design: A prospective study conducted using non-probability sampling. Objective and subjective data on Hepatitis B viral infectionand associated risk factors were collected using a pro-forma to obtain and record relevant information

Place and study duration: Goesa community, Shendam Local Government Area, Plateau state, Nigeria; October 2022

Methodology: A prospective study conducted using non-probability sampling to recruit 124 respondents that gave consent to be screened for Hepatitis B and participate in the study in October, 2022. A pro-forma was used to obtain information regarding demographics, risk factors associated with contracting Hepatitis B virus, previous Hepatitis B virus screening result and Hepatitis B virus vaccination history. These were determined by interviewing and testing each participant for Hepatitis B virus

Results: A total of 124 study participants were screened for Hepatitis B with a mean age of 30 ±10.4 years. The study population comprised of equal numbers of males and females, 62 each. 41.9%, 51.6% and 6.5% had primary, secondary and tertiary level of education respectively and 78.2% were businessmen and women. Out of the 124 study participants, 14 tested positive to hepatitis B. About 2 (14.3%) of those who tested positive have a history of blood transfusion. Also, a statistically significant relationship exists between the level of education and participants' history of Hepatitis B screening as revealed by the output of study analysis ($p<0.05$). The prevalence rate of Hepatitis B virus in Goesa community was 11.29%

Conclusion: The prevalence rate of Hepatitis B infection among the study participants in Goesa community is 11.29%, and the most common risk factor associated with contracting this virus is a history of blood transfusion. Other risk behaviors practiced among the study population include body piercing (tattoo) and sharing of razor blades. Results of the study revealed that educated individuals in this community are more open to go for Hepatitis B screening than those that are uneducated

Keywords:*Hepatitis B, risk factors, screening, prevalence and associated*

1. INTRODUCTION

Hepatitis B is an infectious disease caused by the Hepatitis B virus (HBV) that affects the liver. It can cause both acute and chronic infection but many people have no symptoms during the initial phase of the infection [1]. Acute infection with hepatitis B virus is associated with acute viral hepatitis, an illness that begins with general ill-health, loss of appetite, nausea, vomiting, body aches, mild fever, and dark urine, and then progresses to development of jaundice. The illness usually lasts for a few weeks and then gradually improves in most affected people [2].Chronic infection with hepatitis B virus either may be asymptomatic or may be associated with a chronic inflammation of the liver (chronic hepatitis), leading to cirrhosis over a period of several years. This type of infection dramatically increases the incidence of hepatocellular carcinoma (HCC, liver cancer). Across Europe, hepatitis B and C causes approximately 50% of hepatocellular carcinomas [3].Nevertheless, Hepatitis B infection has been preventable by vaccination since 1982. Vaccination is recommended by the World Health Organization in the first day of life [4]. Two or three doses are required at a later time for full effect. It is also recommended that all blood be tested for Hepatitis B before transfusion and condoms be used during sexual intercourse to prevent infection. During an initial infection, care is based on the symptoms that an individual presents with and for those who develop chronic disease, antiviral medication such as tenofovir or interferon may be useful. Liver transplant is sometimes used for cirrhosis [1].Prevalence is a measure of frequency of illness, disease, or health conditions. Unlike incidence, which reflects new occurrences or changes in health states, prevalence is concerned with already existing health conditions, regardless of whether that condition is of recent onset or long-standing. Thus, prevalence of a particular condition refers to the proportion of the population, which has that condition at a specific time [5]. About one-third of the world population has been infected with Hepatitis B virus at one time in their lives, including 343 million that have chronic infections. Another 129 million new infections occurred in 2013 and over 750,000 people die of Hepatitis B infection each year [1]; about 300,000 of these are due to liver cancer. In Africa, approximately 60 million people live with chronic HBV infection with an estimated prevalence of 6.2%. New infection rates are highest among children, and transmission predominantly occurs via perinatal routes. The global prevalence of chronic HBV infection among children under five years declined from 5% in the pre-vaccine era (1980s to early 2000s) to less than 1% in 2019. Nigeria is ranked as one of the countries that is hyper-endemic for HBV infection (>8). Geographically, the North Central zone have prevalence of 21.3%, North East zone 2.1%, North West zone 14.9%, South East Zone 12.8%, South South zone 12.8%, South West zone 31.9% [6]. Jos, Plateau State, Nigeria has a prevalence of 13.9%. The male subject accounted for incident of (9.1%) and the female counterpart accounted for incident rates of 4.8% [7]. Transmission of hepatitis B virus results from exposure to infectious blood or body fluids containing blood. It is 50 to 100 times more infectious than human immunodeficiency virus (CDC, 2015). Possible forms of transmission include sexual contact [8], blood transfusions and transfusions with other human blood products [9], re-use of contaminated needles and syringe, and vertical transmission from mother to child (MTCT) during childbirth. However, at least 30% of reported hepatitis B among adults cannot be associated with an identifiable risk factor [10]. Breastfeeding after proper immune prophylaxis does not appear to contribute to mother-to-child-transmission (MTCT) of HBV [11].The tests, called assays, for detection of hepatitis B virus infection involve serum or blood tests that detect either viral antigens (proteins produced by the virus) or antibodies produced by the host [12].The hepatitis B surface antigen (HBsAg) is most frequently used to screen for the presence of this infection. It is the first detectable viral antigen to appear during infection. However, early in an infection, this antigen may not be present and it may be undetectable later in the infection as it is being cleared by the host. The infectious virion contains an inner core particle enclosing viral genome. The icosahedral core particle is made of 180 or 240 copies of core protein, alternatively known as hepatitis B core antigen, or HBcAg. During this window in which the host remains infected but is successfully clearing the virus, immunoglobulin M (IgM) antibodies specific to the hepatitis B core antigen (anti-HBc IgM) may be the only serological evidence of disease. Therefore, most hepatitis B diagnostic panels contain HBsAg and total anti-HBc [13]. The time between the removal of the HBsAg and the appearance of anti-HBs is called window period. A

persons negative for HBsAg but positive for anti-HBs either has cleared an infection or has been vaccinated previously. Individuals who remain HBsAg positive for at least six months are considered to be hepatitis B carriers [14]. Individuals with high viral loads, characteristically have ground glass hepatocytes on biopsy. Vaccines for the prevention of hepatitis B have been routinely recommended for babies since 1991 in the United States. The first dose is generally recommended within a day of birth.The vaccine is more effective in children and 95% of those vaccinated have protective levels of antibody. This drops to around 90% at 40 years of age and to around 75% in those over 60 years. For new-borns of HBsAg-positive mothers: hepatitis B vaccine alone, hepatitis B immunoglobulin alone, or the combination of vaccine plus hepatitis B immunoglobulin, all prevent hepatitis B occurrence. Furthermore, the combination of vaccine plus hepatitis B immunoglobulin is superior to vaccine alone [15]. This combination prevents HBV transmission around the time of birth in 86% to 99% of cases [16].Tenofovir given in the second or third trimester can reduce the risk of mother to child transmission by 77% when combined with hepatitis B immunoglobulin and the hepatitis B vaccine, especially for pregnant women with high hepatitis B virus DNA levels [17]. Goals of management of hepatitis B virus infection are to achieve HBeAg seroconversion and development of anti-HBe, to achieve undetectable HBV DNA, normalize serum ALT, to loose HBsAg and develop antibodies (ultimate goal), to prevent or retard liver disease progression to cirrhosis, liver failure and liver cancer [18]. All adults, adolescents and children with chronic hepatitis B (CHB) and clinical evidence of compensated or decompensated cirrhosis (or cirrhosis based on APRI score >2 in adults) should be treated, regardless of ALT levels, HBeAg status or HBV DNA levels. Understanding the risk factors associated with the transmission of this virus has become pertinent in order to prevent new infections and reduce the prevalence of infection, hence the reason for this study in Goesa community of Shendam Local Government Area of Plateau state, Nigeria.

2. MATERIALS/METHOD

2.1 Materials

- Pro-forma
- Hepatitis B testing kits
- Writing materials/stationary
- Vehicle
- Tricycle

2.2 Method

A prospective study conducted using non-probability sampling to recruit 124 respondents that gave consent to be screened for Hepatitis B and participate in the study in October, 2022. A pro-forma was used to obtain information regarding demographics, risk factors to contracting Hepatitis B virus, previous Hepatitis B virus screening result, previous Hepatitis B virus investigation and vaccination history. These were determined by interviewing and testing each participant for Hepatitis B virus

2.2.1Sampling procedure/data collection technique

Non probability sampling wasused for all respondents that gave consent for Hepatitis B screening. Thestudy involved pricking of finger tips to obtain little blood sample for the test, therefore the respondents had the right to refusal or withdrawal. A pro-forma was used to obtain information regarding demographics, risk factors to contracting Hepatitis B virus, previous Hepatitis B virus screening result, investigation and vaccination history

2.2.2 Data analysis

Data was analyzed using Statistical Package for Sciences Software (SPSS version 20). The results were presented using simple frequencies with percentages in appropriate tables to display the

descriptive part of the result. Test for association between variables was also conducted and a p-value of <0.05 was considered significant

2.2.3 Calculation of Prevalence (P)

$$\boldsymbol{P} = \frac{\text{Number of participants that tested positive}}{\text{Total number of participants tested}}$$

Number of participants that tested positive = 14

Total number of participants tested = 124

$$P = \frac{14}{124}$$

= 0.1129 (11.29%)

3. RESULTS AND DISCUSSION

3.1 Results

Table 1: Socio-demographic Characteristics

Variable	Frequency	Percentage (%)
Age in Years		
<20	15	12.1
20-29	49	39.5
30-39	37	29.8
40-49	15	12.1
50-69	8	6.5
Gender		
Male	62	50
Female	62	50
Marital Status		

Single	39	31.5
Married	82	62.1
Divorced	1	0.8
Widow	2	1.6
Level Of Education		
Primary	52	41.9
Secondary	64	51.6
Tertiary	8	6.5
Occupation		
Students	25	20.1
Businessmen/women	97	78.2
Civil servants	2	1.7
Mean age ± SD	30 ±10.4	
Mean weight (Kg)	65.79	
Mean Height	163.22	
Mean BMI (Kg/M^2)	24.450	

N=124

A total number of 124 individuals were included; 62 men and 62 women respectively. Majority of the individuals fell within the agesof 20-39 years, with an average age of 30 years. About 62.1% of the participants were married and 31.5% were single. Majority (51.6%) had a secondary school. Also, most of the participants (78.2%) were businessmen/women and 20.1% were students

Table 2: Associated Risk Factors

Variable	**Yes**	**No**
	N(%)	**N(%)**

Have you had unprotected sexual contact with more than one partner?	0(0)	124(100)
Have you been transfused with blood?	11(8.9)	113(91.1)
Have you shared toothbrushes, razors or nail clippers that have been exposed to blood?	1(0.8)	123(99.2)
Have you received tattoo or body piercing?	11(8.9)	113(91.1)
Have you injected yourself with drugs and sharing needles and syringes with others?	0(0)	124(100)
Have you used unsterilized sharps?	0(0)	124(100)

N=124

Table 2 above reveals that about 11(8.9%) of the participants have a history of blood transfusion and had received tattoo or body piercing. Also 1(0.8%) had shared toothbrushes, razors or nail clippers that have been exposed to blood.

Table 3: Factors associated with previous screening history

Variable	Previously Screened N(%)	Not Previously Screened N(%)	P-value

Age in Years			0.443
<20	1(6.6)	14(93.4)	
20-29	1(2.1)	48(97.9)	
30-39	1(2.7)	36(97.3)	
40-49	0(0)	15(100)	
50-69	0(0)	8(100)	
Gender			0.604
Male	2(3.2)	60(96.8)	
Female	1(1.6)	61(98.4)	
Marital Status			0.990
Single	1(2.6)	38(97.4)	
Married	2(2.4)	80(97.6)	
Divorced	0(0)	1(100)	
Widow	0(0)	2(100)	
Level Of Education			0.002*
Primary	0(0)	52(100)	
Secondary	2(3.1)	62(96.9)	
Tertiary	1(12.5	7(87.5)	
Occupation			
Students	1(4)	24(96)	1.00
Businessmen/women	2(2.1)	95(97.9)	
Civil servants	0(0)	2(100)	

*N=124;*Test is significant when P-value is <0.05*

Table 3 above shows that only the participants' level of education has a significant relationship with their history of screening for hepatitis B. Other variables such as occupation, marital status, gender and age have no significant relationship with history of screening for hepatitis B

Table 4: Gender of those who tested positive to Hepatitis B test

Variable	Frequency	Percentage (%)
Gender		
Male	11	78.6
Female	3	21.4
Marital Status		
Single	7	50
Married	7	50
Divorced	0	0
Widow	0	0

N=14

Table 4 above shows that majority (78.6%) of the individuals who tested positive to hepatitis B test are males, whereas the remaining (21.4%) tested negative. Meanwhile, an equal number (50%) of single people tested positive to the test as compared to those that are married. None of the individuals who tested positive is either a widow or divorced

Table 5: Risk factors associated withthose who tested positive to Hepatitis B

Variable	Yes N(%)	No N(%)
Have you had unprotected sexual contact with more than	0(0)	14(100)

one partner?		
Have you been transfused with blood?	2(14.3)	12(85.7)
Have you shared toothbrushes, razors or nail clippers that have been exposed to blood?	0(0)	14(100)
Have you received tattoo or body piercing?	0(0)	14(100)
Have you injected yourself with drugs and sharing needles and syringes with others?	0(0)	14(100)
Have you used unsterilized sharps?	0(0)	14(100)

N=14

It is captured in Table 5 above that only 2 (14.3%) of those who tested positive to Hepatitis B have had a blood transfusion experience. None of the remaining 12 have any association with the other listed risk factors

3.2 Discussion

The results from this study indicated a prevalence rate of 11.29% among the residents of Goesa community, a little below the findings of a cross-sectional study conducted across the six geopolitical zones of Nigeria, where the prevalence of hepatitis B infection was 12.2% [19]. The cultural and social diversity among these regions might have contributed to the slight difference in the prevalence rate of hepatitis B reported from these two studies conducted in Nigeria. Findings from the study also revealed that about 11(8.9%) of the participants have a history of blood transfusion and had received tattoo or body piercing. But only 1(0.8%) had previously shared toothbrushes, razors or nail clippers that have been exposed to blood. Nevertheless, this finding is not consistent with that of Chul *et al.,* 2016 [20], which indicated that the use of unsterilized sharps and unprotected sexual intercourse with more than a partner were the leading risk factorsfor Hepatitis B among majority of the study participants.Transfusion of blood and receiving tattoo or body piercing are major risk factors to contracting hepatitis B virus infection especially when such blood is not properly screened before transfusion. The difference in the leading risk factors for Hepatitis B in the two studies may not be unconnected with the different settings where each of the studies was conducted and also the demographic characteristics of the study population in each case. While there may be low cases of the transfusion of unscreened blood in urban areas, such areas may likely have higher cases of unprotected sexual activity with multiple partners. It can also be deduced from the findings of this study that level of education has a significant relationship with people's behavior towards health services, to corroborate the report of Yang & Wang, 2014 [21] which stated thateducational level and socioeconomic status are also important factors known to affect patients' behavior towards health access. This finding is consistent with the study of Mitchell & Colvin, 2010 [22], which also revealed that level of education has a significant relationship with the study population's history of Hepatitis B screening. This relationship exists because education exposes an individual to the importance and benefits of accessing health services such as the screening and vaccination for Hepatitis B. On the other hand, this study found that none of the study participants has been vaccinated against Hepatitis B; similar to that of Terrault*et al*., 2018 [23], who in a study among citizens in rural areas in Ethiopia where about 82% of the study population had never been vaccinated with at least one dose of HBV vaccine. This unfortunate trend may be related to the lack of awareness on the importance of Hepatitis B vaccination among these populations. Also, the lack of vaccination history seen among the

participants in these two studies may not be unconnected to the lack of access to health facilities where Hepatitis B vaccine is available to be administered by qualified health personnel. Effective Link to care with a successful implementation of Hepatitis B program in the care of various patients can enable the community to build up trust among its members, and further empower the community. The health status outcomes can not only help to modify individual's health belief, but they can also influence the community's perception of the need for health services. This study also demonstrates a significant lack of Hepatitis B Linkage to care in a high prevalence population, as such individuals will benefit from the community-based initiatives. Successful hepatitis B Link to care in the community setting involves full mobilization of resources, including health care professionals who can provide culturally competent health care. Partnering with community organizations and fostering both medical and non-medical personnel are essential to promoting equitable access and improving the community's overall health and wellbeing.

4. CONCLUSION

The prevalence rate of Hepatitis B virus infection among the study participants in Goesa community is 11.29%, and the most common risk factor associated with contracting this virus is having a history of blood transfusion. Other risk behaviours practiced among the study population include body piercing (tattoo) and sharing of razor blades. Results of the study revealed that educated individuals in this community are more open to go for Hepatitis B screening than those that are uneducated, nevertheless none of the study participants has received a dose of Hepatitis B vaccine.

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