

Research Article

Seroprevalence And Sociodemographic Characteristics of Hepatitis B Virus Infection Among Pregnant Women Attending Rural Hospital in Karu-Abuja, Nigeria

Dr Sunusi Rimi GARBA¹, Dr Amwe Sunday AKU¹, Dr Abdulsalam Ali UMARU², Dr Nanman NANDANG³, Dr Saadatu Lafia BABA¹, Dr Ikechukwu Jeremiah UDEH⁴, Aliyu Amina UMAR⁵, Dr Richard Zubvushia ACHI³, Dr Farida Abdulkarim SHITTU⁶, Dr Chukwuemeka Precious ANYAOGU⁴, Dr Adewumi Adedoyin ADESIDA⁴, Dr Aloy Okechukwu UGWU⁷, Dr Anas Funtua RABIU⁸, Dr Marcus Mbakwe⁹, Dr Sunday Isaac OMISAKIN¹⁰, Dr SHEDUM Nantim Sunday¹, Dr ABDULKARIM Junaidu¹, Dr NANKAT Nansuk Nansel⁴

¹Department of Obstetrics and Gynaecology Nigeria Customs Service Hospital KaruAbuja

²Head of Medical, Nigeria Customs Service Headquarters Abuja

³Dept of Surgery Nigeria Customs Hospital Karu, Abuja

⁴Department of Family Medicine Nigeria Customs Service Hospital Karu Abuja

⁵PNO at National Hospital Abuja

⁶Department of Internal Medicine, Cardiocare Multispecialty Hospital, Garki, Abuja

⁷Department of Obstetrics and Gynaecology, 68 Nigerian Army Reference Hospital, Yaba, Lagos

⁸Federal Teaching Hospital, Katsina state, Nigeria

⁹R-Jolad Plus Multi Specialist Hospital, Gbagada, Lagos, Nigeria.

¹⁰Department of Obstetrics and Gynaecology Lagos University Teaching hospital/College of medicine University of Lagos, Nigeria

Abstract:

Background: Hepatitis B virus (HBV) infection in pregnancy is associated with direct effect of pregnancy and potential viral transmission from mother to newborn. The data on hepatitis B virus infection among pregnant women in the rural area of Karu are very scarce. It is associated with a serious burden on the health care system and the economy of the family. This study therefore aimed to determine the seroprevalence of hepatitis b virus infection among pregnant women attending rural hospital in Karu-Abuja, Nigeria from 1st January 2021 to 31st December 2021

Study design: This was a retrospective cross-sectional study carried out among pregnant women that booked for antenatal care at Nigeria Customs Hospital Karu Abuja over a one-year period.

Materials and Method: Cases were identified from records in labour ward, and antenatal clinic, from November 1st, 2023, to October 31st, 2024. Data was entered and analyzed using the IBM Statistical Product and Service Solutions (SPSS Statistics) Version 27. Armonk, NY: IBM CorpA

Results: A total of 906 pregnant women were registered for antenatal care during the study period of which 79 cases were diagnosed with hepatitis B virus infection and only 74 has the complete information and were included in the statistical analysis. The retrieval rate was 93.6% and the prevalence of hepatitis B virus infection among the study participants was 8.7%. The mean age of the study participants were 31.459 ± 4.4635 years, The mean gestational age at the diagnosis was 23.86 (4.73) weeks. Majority of the participants were multigravida and had attended tertiary levels of education and were booked. About 44 (59.2) participants had received Hepatis vaccine.

Conclusion: The prevalence rate of hepatitis B sero-positivity among pregnant women attending the antenatal clinic was higher more than the national target of 8.0 and majority of participants were unvaccinated for HBV.

Keywords: HBV in pregnancy, seroprevalence, unvaccinated.

Introduction

Hepatitis B virus (HBV) infection is a major global public health issue with significant burden to the economic and health care systems.¹ It is the 10th leading cause of death worldwide. (Noubiap JJN 2015)WHO estimates that in 2015, 900 000 people have died from HBV infection, mostly as a result of cirrhosis or hepatocellular carcinoma.²In most developing countries, HBV is a disease of public health importance and as such screening of pregnant mothers in our antenatal clinics cannot be overemphasized.³

The prevalence of HBV varies from one country to another and even in the different region of the same county.^{2, 3} There are about two billion people who have been exposed to HBV globally, and about 360 million people have become chronic carriers. (Noubiap JJN 2015)Approximately 70% of people living with HBV infection live in areas where HBV infection is highly endemic, particularly in parts of Asia and Africa.⁴ In addition, about 50 million new cases are diagnosed annually worldwide in which majority cases are classified as mother-to-child transmission (MTCT).⁵ HBV-infected infants have up to a 90% chance of becoming chronic carriers, and approximately 25% of these will die prematurely from liver failure or cirrhosis. (Liu J 2020) Whereas toddlers and young children clear the virus in about 50% of cases while adult have only 5% chance of progression to chronic carriers.⁵

The risk factors for transmission of HBV include multiple sexual partners, intravenous drug users, tattooing, dental procedures, level of education, blood transfusion, surgery, unsafe injections, abortions and traditional practices such as scarification, circumcision, and ear piercing.⁵ Recent studies have shown about 10% to 20% of HbsAg-positive pregnant women would transmit the virus to their babies and compared almost 100% transmission from the mothers who have both positive to HbsAg and HbeAg antigen.^{3, 5}

Women with HBV associated decompensate cirrhosis have impaired fertility and are at risk of gestational hypertension, abruption placenta, preterm birth and intrauterine growth restriction, maternal and perinatal death, and on the other hand, pregnancy itself does not directly impact HBV-related liver disease. ^{3, 5, 6}

The effective strategies for reducing the incidence of mother to child transmission of HBV are maternal screening during pregnancy; maternal antiviral prophylaxis during pregnancy and postpartum period; and post-exposure prophylaxis of the babies consisting active and passive vaccination within 12 hours of delivery.^{6, 7-11}

Nigeria is ranked as one of the countries with hyper-endemic HBV infection (> 8%). Approximately nine in ten Nigerians who live with chronic HBV are unaware of their infection status and are missing from the global public health statistics due to a lack of resources, awareness, and political will for addressing Nigeria's HBV plight. Consequently, Nigeria has one of the highest rates of HBV-attributable cancer in West Africa, with an age-standardized incidence estimate of 2.6 to < 5.1 cases per 100,000 person-years.^{3, 5}

This study therefore aimed to determine the burden of hepatitis virus in pregnancy among antenatal attendees at Custom Hospital Karu is in the north central region of Nigeria, the zone with the second highest prevalence of hepatitis B in pregnancy in the country.

Methodology-

Study design and Setting: This was a retrospective cross-sectional study carried out between November 2023 to October 2024. The study was carried out at Nigeria Customs Service Hospital. located in the rural area of Karu north central Nigeria. It's a 100 bedded hospital that offers services to customs officers and the members of communities. The hospital ANC clinic provides specialist-led antenatal screening services, such as HIV testing, hemoglobin determination, blood group testing, rapid plasma reagin testing, and urinalysis (for glucose, proteins, and infection) for more than 35 pregnant women per day.

Study population: These were pregnant women who registered for antenatal care at Nigeria Customs service Hospital Karu, North central, Nigeria.

Selection criteria:

Inclusion criteria

All retrievable case files of cases of HBV infection diagnosed and managed within the study period

Exclusion criteria

Those with incomplete records case files were excluded from the study.

Data collection.

Cases were identified from records in labour ward, antenatal clinic, theatre, and gynaecological emergency. The case notes were retrieved from the Central Medical Record's library. Information obtained included socio-demographic characteristics such as age, parity, occupation, educational status, marital status, other information includes gestational age booking, gestational age at diagnosis, risk factors for HBV infections and obstetric history.

The number of deliveries during the 6 months of review was extracted from the labour ward record.

Data management

Dr Aloy Okechukwu UGWU et al / Seroprevalence And Sociodemographic Characteristics of Hepatitis B Virus Infection Among Pregnant Women Attending Rural Hospital in Karu-Abuja, Nigeria

Data was entered and analyzed using the IBM Statistical Product and Service Solutions (SPSS Statistics) Version 25. Armonk, NY: IBM Corp. The categorical variables were summarized and presented as frequency distribution tables while continuous variables will be presented as mean (\pm standard deviation). A multivariable logistic regression model or the odd ratio will be used to test the association HBV and the risk factors. A value of $P < 0.05$ will be considered statistically significant at 95% confidence interval (CI).

Ethical Considerations

The study was carried out after obtaining ethical approval from the Health Research Ethics Committee (HREC) of the health service commission.

Results: A total of 906 pregnant women were registered for antenatal care during the study period of which 79 cases were diagnosed with hepatitis B virus infection and only 74 has the complete information and were included in the statistical analysis. The retrieval rate was 93.6% and the prevalence of hepatitis B virus infection among the study participants was 8.7%

Table 1: Shows socio-demographic and clinical characteristics of the study participants.

The mean age of the study participants were 31.459 ± 4.4635 years, The mean gestational age at the diagnosis was 23.86 (4.73) weeks. Majority of the participants had multigravida and had attended tertiary levels of education and were booked. About 44 (59.2) participants had received Hepatis vaccine.

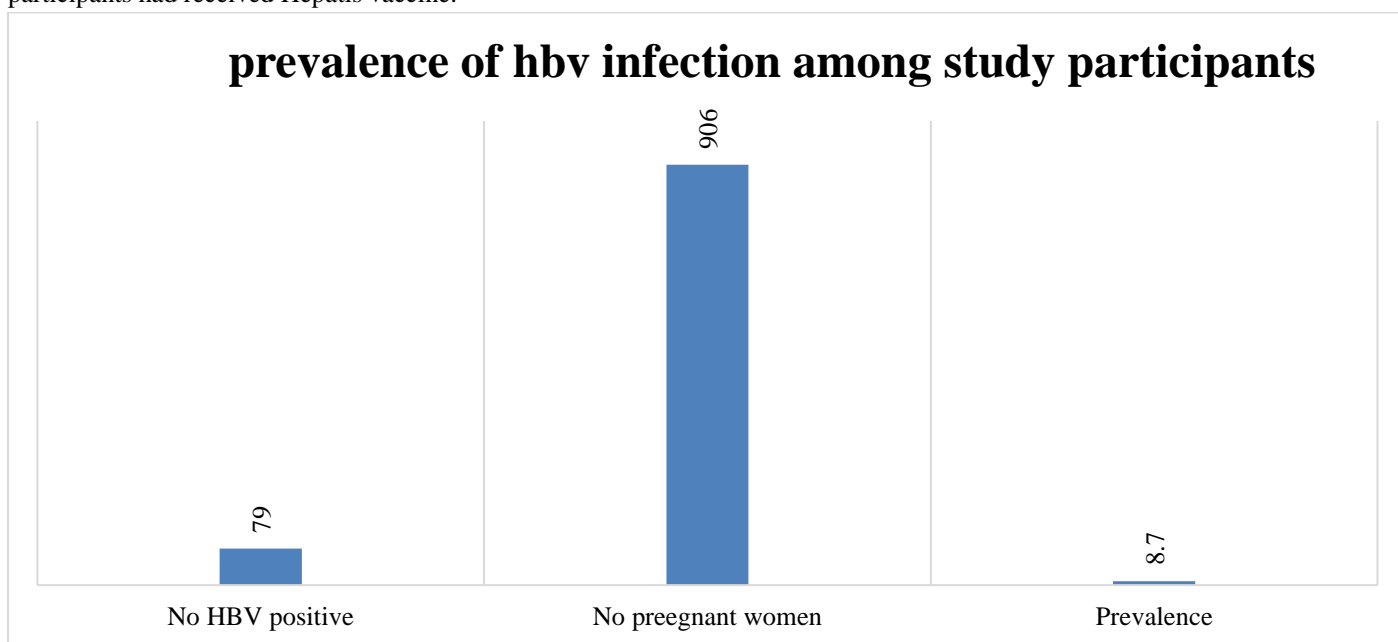


Figure 1: the prevalence of HBV infection among the study participants. The prevalence of hepatitis B virus infection among the study participants was 8.7%.

Table 1 Sociodemographic and clinical characteristics of the study participants. The mean gestational age at the diagnosis was 23.86 (4.73) weeks.

Table 1 Sociodemographic and clinical characteristics of the study participants

Variable	Number (n) = 74	Percentage (%)
Age in years		
<25	11	14.9
26-30	23	31.1
31-35	24	32.4
≥ 36	16	21.6
Mean age	31.459 ± 4.4635	
Parity		
0	9	12.2
1	26	35.1
2	3	4.1
≥ 3	36	48.6
Educational status		
Primary	9	12.2
Secondary	14	18.9

Tertiary	51	68.9
Booking status		
Booked	71	95.9
Unbooked	3	4.1
Gestational age at Diagnosis		
<20wks	14	18.9
20-24weeks	35	47.3
24-32week	22	29.7
33weeks+	3	4.1
Mode of delivering		
CS	27	36.5
SVD	47	63.5
HBV vaccine		
Not received	44	59.5
Received	30	40.5

Discussion

This study found a seroprevalence of 8.7% for hepatitis B virus (HBV) infection among pregnant women in Karu, Abuja. This prevalence is within the range reported for sub-Saharan Africa, a region classified as high endemic for HBV infection, with a general prevalence between 6% and 12% .¹ However, the result is slightly higher than the 5.1% reported in a similar study conducted in Enugu, Nigeria [2], and the 4.3% reported in Ibadan, Nigeria.³ These regional differences may reflect variations in healthcare access, vaccination coverage, and sociodemographic factors.

Globally, the prevalence of HBV among pregnant women varies significantly. For instance, studies in high-income countries such as the United States and the United Kingdom report lower prevalence rates of 0.38% and 0.15%, respectively.^{4,5} These differences are largely attributable to comprehensive vaccination programs and effective public health strategies in these regions. In contrast, prevalence rates in other parts of Africa, such as Ethiopia (6.1%) and Ghana (12.3%), are comparable to or exceed the findings in this study.^{6,7} These results highlight the persistent challenge of HBV in low- and middle-income countries, where systemic barriers limit the impact of preventive and curative measures.

The majority of the participants in this study were multigravida (48.6%) and had attained tertiary education (68.9%). These findings contrast with a study in Ghana, where lower educational levels were associated with higher HBV prevalence.⁷ This discrepancy could be due to regional differences in the population structure or healthcare-seeking behaviors. In this study, a large proportion of participants (95.9%) were booked for antenatal care, which provides an opportunity for routine HBV screening and interventions to prevent mother-to-child transmission.

Interestingly, 40.5% of participants reported receiving the HBV vaccine, a proportion higher than the 25% vaccination coverage reported in a study conducted in northern Nigeria.⁸ Despite this, the high seroprevalence observed suggests gaps in vaccine efficacy, incomplete vaccination schedules, or potential infection prior to vaccination. This aligns with findings from Ethiopia, where HBV seroprevalence remained high despite vaccination campaigns.⁶

The age distribution showed the highest prevalence among women aged 31–35 years (32.4%), similar to findings in studies conducted in other parts of Nigeria and Africa.^{2,9} This demographic represents women of peak reproductive age, emphasizing the critical need for interventions targeting this group. The mean gestational age at diagnosis in this study was 23.86 ± 4.73 weeks, with the majority diagnosed between 20 and 24 weeks. Early gestational diagnosis is crucial for implementing strategies to reduce vertical transmission, including maternal antiviral therapy and neonatal immunization.

Strengths and Limitations

A major strength of this study is the high retrieval rate (93.6%), which enhances the reliability of the findings. Additionally, the focus on pregnant women in a resource-limited setting addresses a critical gap in HBV research. However, the retrospective cross-sectional design limits the ability to establish causality or temporal relationships. Furthermore, the study was conducted in a single healthcare facility, which may limit generalizability to other regions of Nigeria or Africa.

Implications for Practice and Research

The findings of this study underscore the urgent need for strengthened HBV prevention and control measures in Nigeria and similar settings. Integrating HBV screening and vaccination into routine antenatal care is essential to reduce the burden of maternal and neonatal HBV infection. Public health campaigns targeting at-risk populations, including women of childbearing age, are also critical. Future research should explore factors contributing to persistent HBV transmission despite vaccination efforts and evaluate the effectiveness of interventions such as maternal antiviral therapy and neonatal immunization.

Conclusion

The prevalence of HBV among pregnant women in Karu, Abuja, is high at 8.7%, highlighting a significant public health challenge. Efforts to improve vaccination coverage, enhance early screening, and implement targeted interventions during pregnancy are imperative to achieving the global hepatitis elimination targets. Further studies in diverse settings are needed to provide a broader understanding of HBV epidemiology and inform effective policies.

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