Asian Research Journal of Gynaecology and Obstetrics

Volume 7, Issue 1, Page 207-218, 2024; Article no.ARJGO.120559

Prevalence of Hepatitis B Virus Infection among Antenatal Care Attendee in Makurdi, Benue State, Nigeria: A 6-year Review of Tertiary Hospital Records

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/120559

Original Research Article

Received: 29/05/2024
Accepted: 02/08/2024
Published: 06/08/2024

ABSTRACT

Background: The hepatitis B virus (HBV) infection has an accelerated rate of transmission from mother to child in pregnancy. A review of the prevalence of HBV infection among pregnant antenatal care attendee may increase knowledge of the infection, thereby possibly contributing to reduction of rate of mother to child transmission of the virus.
Objective: This study was to assess the prevalence of the HBV infection among pregnant women attending antenatal care at a public tertiary health facility in Makurdi, Benue State, Nigeria.

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Cite as: *CJ, Agulebe, Maanongun MT, Nombur LI, and Abu PO. 2024. "Prevalence of Hepatitis B Virus Infection Among Antenatal Care Attendee in Makurdi, Benue State, Nigeria: A 6-Year Review of Tertiary Hospital Records". Asian Research Journal of Gynaecology and Obstetrics 7 (1):207-18. https://journalarjgo.com/index.php/ARJGO/article/view/228.*

Methods: This was a retrospective cross-sectional study, in which records of pregnant mothers that attended and accessed antenatal care services at the Department of Obstetrics and Gynaecology of Federal Medical Centre, Makurdi from January, 2016 to December 2021 were retrieved from the hospital's Record Department database. This was done by testing the patients' blood for hepatis B surface antigen (HBsAg) during their booking visit. They also had HBV profile testing to different the panels of HBV infection based on virologic markers. The Pregnant mothers with complete data about socio-demographic characteristics and laboratory examination results were included in the study. While those pregnant mothers with incomplete data were excluded from the study. The variables collected include total number of pregnant women who registered for antenatal care in the 6 years of the study, maternal age, parity, educational background, employment status, medical conditions in pregnancy and HBV profile status of the pregnant women. Data was entered and processed using SPSS version 25.

Results: The prevalence rate of HBsAg positivity among the pregnant women attending antenatal care during the studied period was 13.66% (*n* = 2417). The prevalence rate of HBV infection susceptibility among the pregnant mothers attending antenatal care was observed to be 43.44% while that of HBV immunity was found to be 36.15%. The prevalence of previous/occult infection among the antenatal attendee during the studied period was 14.91%, that of inactive HBsAg carrier and active infection were 4.08% and 0.42%, respectively. According to age distribution, the prevalence of HBsAg in pregnant women increased with age, with the highest positivity rate in pregnant women aged >30 years, followed by those aged 25–29 years. Meanwhile, pregnant women aged <20 years had the lowest rates of HBV infection. Of 849 pregnant women that had HIV in pregnancy, 50.53% (429) were positive to HBsAg serological testing with 11.43% of them having active infection.

Conclusion: The Hepatitis B Virus infection rate still stands high among pregnant mothers attending antenatal clinics at the Department of Obstetrics and Gynaecology of Federal Medical Centre (FMC), Makurdi. The high prevalence rate of HBV infection rate observed during this review could possibly support high rate of infants, children and adult transmission of HBV in Benue State. Hence, to prevent and reduced the rate of mother to child transmission of HBV infection, policy makers, stakeholders as well as non-governmental organizations should intensify efforts to create and sustained awareness campaign about the dangers of hepatitis B virus infection.

Keywords: Prevalence; HBV; attendee; antenatal care; Makurdi.

1. INTRODUCTION

The hepatitis B virus (HBV) infection stands as one of the major public health challenge affecting the entire world. It also contributes negatively to the socioeconomic burden and health of the nations. Hepatitis B virus infection can lead to a potentially life-threatening acute or chronic liver disease with a significant global health challenges and impact. Hepatitis B virus infection could associate with a high risk of major health challenges and death due to liver cirrhosis, liver failure and liver cancers [1]. The transmission of Hepatitis B virus (HBV) infection may occur from various routes such as exposure to infected blood or contaminated bodily fluids, sexual intercourse or contact without protection with an infected individual, blood transfusion, use of infected needles, syringes, and sharps. In children, vertical transmission from mother to child is the commonest route of acquiring hepatitis B virus infection [1,2]. The pregnant mothers with a hepatitis B surface antigen (HBsAg)-positive have increased risk of HBV transmission to the newborn during pregnancy, labour and delivery. This risk increases and become amplified with hepatitis B envelope antigen (HBeAg) being positive [2]. Globally, WHO estimated that, in 2015 about 257 million persons were infected with HBV and about 3.5% of the world population were living with chronic HBV infection [2]. The African especially the Sub-Saharan Africa and Western Pacific regions accounted for 68% of those infected. The immunization in Nigeria [the National Program on Immunization (NPI)] which targeted at prevention of hepatitis B virus infection in newborn infants and adult, started in 1998 with the aim of total elimination of the disease. Hepatitis B virus vaccine dosage coverage in infants had been reported as follows: a 50.6% for first dose, 45.6% second dose and 38.2% for third dose based on National Program on Immunization (NPI) [3]. About 2 billion people globally have been reported to have virologic evidence of recent, current or previous infection with HBV [4]. It is

estimated that, more than 257 million have clinical or serologic evidence of chronic HBV infection [4]. Of important to note is that, patients who are chronic carriers of HBV infection have a greater risk of progression to long-term sequelae of HBV infection including liver failure, chronic hepatitis, liver cirrhosis, liver cell carcinoma, and even mortality [5]. Also, the prevalence of HBV infection globally varies based on geographic location [5,6]. It is highly endemic in low income and poor resource region such sub-Saharan African countries, those in East Asia, and Western Pacific regions [6].

About 65 million women of reproductive age groups globally, are infected with hepatitis B virus and approximately, 9 in every 10 pregnant women who had HBV infection may transmit the viruses to their unborn or new born at the time of delivery. Babies who are born to HBsAg positive and hepatitis B envelope antigen-positive mothers have a 70–90% accelerated risk of acquiring HBV Infection in-utero [5,6]. Approximately, 85–90% of these babies may become the chronic carrier of the HBV and even the long term complications [6]. The WHO recommends screening of pregnant mothers for HBV infection, and also to provide vaccine and hepatitis B immune globulin to new born babies especially on the first day postpartum [7,8].

The prevalence of HBsAg positivity reported among pregnant mothers attending antenatal care vary from one location to another. Globally, chronic HBV infection prevalence has been reported to be 3.5% among women of reproductive age group [7]. In sub-Saharan African countries, the prevalence HBV infection could range between 6% and 25% [7]. The Nigerian national survey of prevalence of HBV infection showed prevalence rate of 12.2% among the general population [8]. A systematic review of HBV infection among pregnant mothers in Nigeria reported a prevalence rate of 14.1% in antenatal attendee [9]. The HBsAg positivity prevalence rate reported among pregnant women attending antenatal care in Bayara, Bauchi State was 17.2% [10].

The World Health Organization in 2016, made commitment toward elimination of hepatitis B virus infection, as a major public health threat, by the year 2030 [4]. In areas of highly endemicity, the major route of HBV infection in infants is mother-to-child transmission (MTCT), which accounts for about 90% of the prevalence in that age group globally. Furthermore, about 4.5 million mothers with chronic HBV infection delivered yearly [5]. In general, babies infected with HBV during pregnancy and after delivery have an 80%–90% chance of the infection progressing to a chronic state and may further leads to complications like liver cirrhosis and liver cell carcinoma in later life [6–8]. Maternal and neonatal complications like preeclampsia, antepartum haemorrhage (placenta previa, abruptio placentae), preterm labour, and gestational diabetes mellitus are more likely to be seen in pregnant mothers with HBV infection [9–11]. Studies also, have reported more likely cases of liver cell carcinoma in individuals who contracted the HBV infection by MTCT route than those through other routes [12]. Hence, disruption of MTCT of HBV infection will greatly reduce the risk of liver disease, [12] since the infection in pregnancy poses a serious risk to the infants and the nation at large [13].

Although, the HBV vaccines are available for effective childhood immunization, the prevalence of HBV infection remains unacceptably high in sub-Saharan African nations and other low income nations [8,13]. In absent of appropriate HBV vaccination and HBV immune globulin prophylaxis, babies delivered to HBV infected women have a greater risk of acquisition of the virus and this may subsequently become chronic, and eventually lead to high transmission rate, long term complications and even mortality [14]. HBV infection is seen as a major obstacle to public health in low resource countries especially in Sub-Sahara Africa as well as China despite the availability of vaccines [15]. It is estimated globally that, more than 86 million individuals are living with chronic HBV infection, and this figure account for one-third of the infected population [15]. Combined HBV vaccine and hepatitis B immunoglobulin for HBV exposed infants had the overall efficacy rate range between 90% and 95% when used as a preventive strategy [15].

The recommendation by the WHO is that, all newborn babies should receive three doses of HBV vaccine and this is believed to provide a protection level of 95% or more against HBV infection. The dosing schedule based of NPI in Nigeria is as follows: first dose is given within 24 hours after delivery, a second dose at 6 weeks of life and a third dose at 14 weeks of life which is similar to WHO recommendation [6,16]. The use of HBV vaccines at birth is pivotal to the prevention of HBV infection in infants. In resource-limited countries including Nigeria, healthcare facilities are not easily accessible and

potent vaccines are most times unavailable, and this accounts for the death of over 10 million children every year [17]. Approximately 13.0% of infants delivered to the mothers who have HBV infection with high viral load become infected with the virus [18].

MTCT of HBV may still be possible after passive/active immunization has been given, and this is a challenge of HBV infection among Nigerian and other low resource nations including Chinese [19]. With regional variations, HBV infection among women of reproductive age and pregnant mothers have been endemic in Nigeria and other sub-Saharan African nations [20]. Therefore, antenatal screening for HBV virologic markers during pregnancy is greatly important in preventing MTCT of HBV infection in endemic region.

Traditionally, certain barriers such as low socioeconomic status, traditional belief and a times poverty have been factors that limit follow-up treatment in Benue State, its rural populace and Nigeria at large. Many at risk infants delivered to pregnant women who are positive to HBsAg therefore, do not usually have human hepatitis B immune globulin at all or sometimes late due to some of the barriers mentioned previously. The coverage rates of HBV vaccination and preventive measures have been largely inadequate with prevalence of HBV infection still unacceptably high [21]. Hence, the need for more studies about HBV infection among pregnant mothers to create awareness and increase knowledge about the infection, in order to reduce MTCT.

This retrospective study is aimed to estimate the prevalence of HBV infection among antenatal attendee accessing antenatal care in Federal Medical Centre, Makurdi, Benue State, Nigeria. The findings could provide us with the needed data about the effectiveness of HBV vaccination programs and preventive strategies against HBV in studied location and the state at large.

2. MATERIALS AND METHODS

This was a retrospective cross-sectional study, in which records of pregnant mothers that attended and accessed antenatal care services at the Department of Obstetrics and Gynaecology of Federal Medical Centre (FMC), Makurdi from January, 2016 to December 2021 were retrieved from the hospital's Record Department database. All pregnant mothers who booked and attended antenatal care services at this facility under the years of review, had routine screening for hepatitis B virus infection. This was done by testing the patients' blood for hepatis B surface antigen (HBsAg) during their booking antenatal care visit. They also had HBV profile testing to different the panels of HBV infection based on virologic markers. The virologic markers of HBV profile results recorded in the case records of patents were as follows: those patients with all the five virologic markers negative as indicated in Table 1 were grouped as being susceptible to HBV infection, those with HBsAg negative and HBsAb positive were grouped as having HBV immunity, those with HBsAg negative and HBcAb positive were grouped as previous/occult infection, then those with HBsAg positive and HBcAb positive were grouped as inactive HBV carriers while those with HBsAg positive and HBeAg positive were grouped as having active infection. Data was retrospectively collected from the Record Department of the facility. The Pregnant mothers with complete data about socio-demographic characteristics and laboratory examination results were included in the study. While those pregnant mothers with incomplete data about socio-demographic characteristics and laboratory examination results of HBsAg as well as incomplete information about five HBV serology markers (results based on HBV Profile as defined in Table 1) were excluded from the study. The other variables collected include total number of pregnant women who registered for antenatal care in the 6 years of the study, maternal age, parity, educational background, employment status, medical conditions in pregnancy and HBV profile status of the pregnant women. The SPSS version 25 was used for data entering and processing. Statistical analysis was done with descriptive statistics using frequency, tables and percentages to determine the prevalence of HBV infection among the antenatal attendee during the years of study.

The research was approved by the Ethics Review Committee of the FMC, Makurdi on 30th June, 2022 (FMR/FMC/MED:159/VOL.1/X). No written informed consent was obtained from the pregnant mothers before commencing the study since it was a retrospective study.

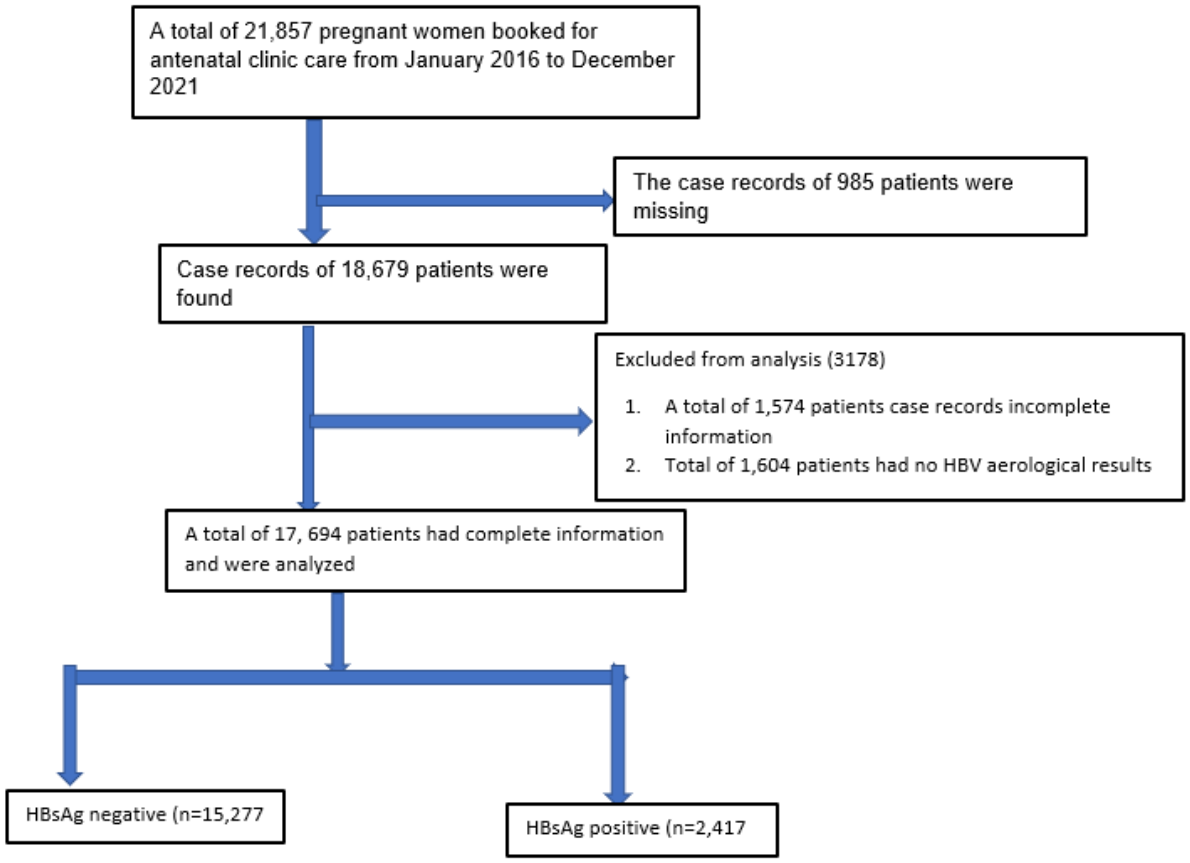

Fig. 1. Study flow diagram

Table 1. Different panels of HBV infection based on virologic markers (HBV Profile)

HBsAg	HBsAb	HBeAg	HBeAb	HBcAb	Interpretation
−	−	−	−	−	Susceptible to infection
−	+	−	−	−	HBV immunity
−	+/−	−	+/−	+	Previous/occult infection
+	−	−	+/−	+	Inactive HBsAg carrier
+	−	+	−	+/−	Active infection

Abbreviations: HBsAg- hepatitis B surface antigen; HBsAb- hepatitis B surface antibody; HBeAg-hepatitis B evelope antigen; HBeAb- hepatitis B evelope antibody; HBcAb, hepatitis B core antibody.

3. RESULTS

Between January 1st, 2016 and December 31st, 2021, antenatal attendee accessing antenatal care at the Department of Obstetrics and Gynaecology of FMC, Makurdi were screened for hepatitis B virus infection. A total of 21,857 pregnant women booked for antenatal clinic care in the centre during the years under review. Out of the above number of patients, 17,694 (80.95%) case records were retrieved with complete information. A total of 4163 were excluded from the study either because of missing case records or incomplete information about the patients. Fig. 1 shows the study flow chart. A total of 17,694 antenatal attendee therefore, met the inclusion criteria and were included in the study and this served as the basis for analysis. The sociodemographic characteristics of pregnant mothers during the study period with the mean average age of the studied population was 29.3 ± 4.1 years (Table 2). The highlight of the clinical characteristics of the pregnant women showed that, 46.39% of them had no obvious health challenges in pregnancy while 32.16% had various degrees of anaemia in pregnancy as indicated in Table 3. The pregnant mothers attending antenatal care

were divided into the HBsAg-positive and HBsAg-negative groups based on the sociodemographic and clinical characteristics of these mothers as showed in Table 4. Of 849 pregnant women that had HIV in pregnancy, 50.53% (429) were positive to HBsAg serological testing (Table 4) with 11.43% of them having active infection as indicated in Table 5. In total, 2417 pregnant women were HBsAg-positive, with a prevalence rate of 13.66%.

Subsequently, the clinical characteristics of pregnant mothers were evaluated using HBV profile screening test. the HBV profile of pregnant women in the five different groups were as follows: those pregnant mothers susceptible to infection (43.44%, n = 7686), HBV immunity (36.15%, n = 6397), previous/occult infection (14.91%, n = 2638), inactive HBsAg carrier (4.08%, n = 722), and active infection (0.42%, n = 251) as shown in Table 5.

Table 2. Sociodemographic Characteristics of the Pregnant Women year by year (17,694)

Variables	2016	2017	2018	2019	2020	2021
Mean age=29.3 ± 4.1						
Age group (Years)	151	79	96	197	219	135
15-19						
20-24	417	341	397	433	502	399
30-34	838	813	905	975	637	1053
35-39	189	107	179	218	303	246
≥40	57	39	21	61	84	49
Marital status	672	411	436	697	585	613
Single						
Married	2118	1741	2020	2135	2413	2302
Widow	301	217	225	341	261	206
Religion	2474	2081	2281	2471	2354	2406
Christianity						
Islam	486	214	263	475	716	619
Traditionalist	131	74	137	227	189	96
Educational status						
No formal	145	84	107	231	196	205
Primary	573	259	413	488	517	612
Secondary	754	577	819	637	503	1061
Tertiary	1619	1449	1342	1817	2239	1243
Occupation						
Civil Servant	1318	978	1147	1166	1142	1515
Farming	639	397	488	685	819	857
Trading	1047	931	941	1106	953	573
Student	87	63	105	217	345	176
Parity						
0	739	563	716	575	849	613
1-4	1967	1588	1600	2349	2019	2216
≥5	385	218	365	249	391	292

Table 3. Clinical Characteristics of Pregnant Women (17,694)

Health status	Total number of patients	Percentage (%)
Anaemia in Pregnancy	5,691	32.16
Hypertensive Disorder in Pregnancy	1257	7.10
Diabetes Mellitus in Pregnancy	1089	6.15
HIV in Pregnancy	849	4.80
Cardiac Disease in Pregnancy	285	1.61
SCD in Pregnancy	106	0.60
Renal disease in Pregnancy	97	0.55
Syphilis Infection in Pregnancy	113	0.64
No obvious health challenge in Pregnancy	8207	46.39
Total	17694	100.00

Table 4. Socio-demographic and Clinical Characteristic of Pregnant Women with HBV Infection (17,694)

Status	Total Number of Patients	HBV Status		Percentage (%) of HBV positivity
		Negative	Positive	
Age group				
15-19	877	770	107	0.60
20-24	2489	2171	318	1.80
25-29	7554	6475	1079	6.10
30-34	5221	4660	561	3.17
35-39	1242	959	283	1.60
≥40	311	242	69	0.39
Marital status				
Single	3414	2783	631	3.67
Married	12729	11116	1613	9.12
Widow	1551	1378	173	0.98
Anaemia in pregnancy	5691	5142	549	9.65
Hypertensive disorder in pregnancy	1257	1020	237	18.85
Diabetes mellitus in pregnancy	1089	970	119	10.93
HIV in pregnancy	849	420	429	50.53
Cardiac disease in pregnancy	285	269	16	5.61
SCD in pregnancy	106	104	2	1.89
Renal disease in pregnancy	97	92	5	5.15
Syphilis infection in pregnancy	113	104	9	7.96
No obvious health challenge during pregnancy	8207	7156	1051	12.80
Total	**17694**	**15277**	**2417(13.66%)**	

Table 5. HBV Profile of Pregnant Women (2,417)

	Susceptible to Infection	HBV Immunity	Previous Infection	Carrier/Inactive Infection	Active Infection	Percentage of Active Infection
Pregnant Women with no obvious Health Challenge	3,331	2,273	1207	287	109	1.33%
Anaemia in Pregnancy	2,214	2,197	1,095	169	16	0.28%
Hypertensive Disorder of Pregnancy	719	339	131	45	23	1.83%
DM in Pregnancy	644	230	124	109	4	0.37%
HIV in Pregnancy	407	192	44	109	97	11.43%
Cardiac DX in Pregnancy	127	104	29	24	1	0.35%
SCD in Pregnancy	85	17	2	-	-	0.00%
Renal DX in Pregnancy	76	19	4	-	-	0.00%
Syphilis in fetus in pregnancy	83	26	2	1	1	0.88
Total	**7686 (43.44%)**	**6397 (36.15%)**	**2638 (14.91%)**	**722 (4.08%)**	**251 (0.42%)**	

4. DISCUSSION

The Hepatitis B Virus infection during pregnancy may leads to severe maternal and infant morbidity with associated long-term complications and even mortality. Globally, the Prevalence of hepatitis B virus infection defers based on geographic location and may varies within the same region. More so, there are regional and population specific variations even within the same country. Hepatitis B virus infection especially the chronic and acute infection could become clinically and epidemiologically significant due to immunosuppressive effect of pregnancy [1-5]. Although, the HBV vaccines are available for effective childhood immunization, the prevalence of HBV infection remains unacceptably high in sub-Saharan African nations and other low income nations [8,13]. In absent of appropriate HBV vaccination and HBV immune globulin prophylaxis, babies delivered to HBV infected women have a greater risk of acquisition of the virus and this may subsequently become chronic, and eventually lead to high transmission rate, with long term complications and even mortality [6-7,14]. The use of antiretroviral treatment has reduced significantly the morbidity and mortality associated with HBV infection, however, the transmission of HBV can still occurs from mother to child during labour and delivery. This therapy in HBV positive mothers also reduces the incidence of MTCT [14]. The MTCT is the major route of transmission of chronic hepatitis B infection to infants in high endemic regions such as Nigeria [6]. The prevention of these infections either from vertical or horizontal route therefore, is the most significant preventive strategy in order to control the HBV infection epidemic. High HBV viral load is the most singular important factor in vertical transmission of HBV in infants delivered to HBV positive mothers [5-6,11].

During antenatal care pregnant mothers should be screened for HBV infection and if infection is found, proper management approach must be instituted to reduce the rate of MTCT. Therefore, this retrospective study is aimed to estimate the prevalence of HBV infection among antenatal attendee accessing antenatal care in Federal Medical Centre, Makurdi, Benue State, Nigeria. The findings could provide us with the needed data about the effectiveness of HBV vaccination programs and preventive strategies against HBV in studied location and the state at large.

This study revealed that the prevalence rate of HBsAg positivity was very high at 13.66% among antenatal attendee in the study area which agreed with the prevalence of 6–25% reported by the WHO African region [8,17]. This finding is similar to the study done by Colin et al [5,6] which showed that Nigeria is in the high endemic region, but the prevalence in this study was higher than prevalence of 6.7% reported by Mustapha et al among women attending antenatal care services in Primary Health Centres in Gamawa Local Government Area [5]. However, the prevalence rate of 1.51% of HBV infection among pregnant women reported by Pindar et al was rather very low compared to finding observed in this study [22]. But the finding is this study is almost similar to the finding of 10.2% prevalence of HBV infection reported by Ukpe et al [23]. The prevalence rate observed in our study agreed with the fact that, the prevalence of HBV infection differs from region to region and even in the same geographic location.

The prevalence in our study is however, lower than a similar study conducted in Bayara hospital, Bauchi State where a prevalence rate of 17.2% was reported [11]. A study in Minna, Niger State, North-Central region by Ndams et al, reported a prevalence of 12.3% [11-16] and 11.0% was reported in Makurdi, Benue State by Mbaawuaga et al. [15] which are almost similar to the finding in our study. Also, a prevalence of 16.5% was reported by Kolawole et al [16] in Osogbo, Osun State, south-western part of Nigeria, which is high and closely similar to the finding observed in our study. The prevalence of 8.3% reported in Ibadan by Chinenye et al [12] in the same South-western Nigeria attest to the fact that, even in the same region, the prevalence of HBV infection differed. Other studies by Ugbebor et al. [14,15] in Edo State, Nigeria had a prevalence of 12.5% and that observed by Musa et al [13] in a country wide systematic review reported 9.6–18.6% prevalence rate which is similar to our finding of high prevalence rate. The prevalence of 11.74% [19] reported in Hakka, China is also similar to our finding and further attest to the variation in prevalence reported globally [8,19]. The variations in the observed prevalence rates of HBV infection among antenatal attendee may be as a result of differences in the geographical location, socio-cultural practices, study design, level of care for the study facility, sample size, population dynamics and test methods employed. Most of the studies quoted above were carried out at secondary and tertiary level of care located mostly in urban or semi urban populations while

few studies were carried out at primary health care setting in rural communities.

Moreover, the prevalence of HBV infection was high between the ages of 25 and 34 years which was more with married couples. This finding was similarly reported by Pindar et [22] al in Gombe State, North-eastern part of Nigeria and Ukpe et al [23] in North central part of Nigeria. In addition, it was observed that, pregnant mothers who had anaemia in pregnancy and Hypertensive disorders of pregnancy were at high risk (9.65%) and (18.85%) of HBV infection respectively during the study period. For patients with HIV infection, 50.53% of them have co-infection with HBV infection with active HBV infection at 11.43%.

The finding of proportion of HBV carriers of 4.08% among the studied population during the study period is however, far lower than the high carrier rate (up to 8%–20%) in Africa and most countries in Asia [18]. This finding is however, higher than that reported in the United States and Western Europe.

The socioeconomic status, public health education, level of awareness, and infection prevention practices by the community and other nations could negatively or otherwise affect the difference in prevalence rate observed in various studies across the world [8]. HBV vaccines have been available since the early 1980s. Nigeria is among the developing countries that integrated the hepatitis B vaccine for newborns into routine immunization in 1998 [4,6] and since then it has been part of National Programme on Immunization (NPI) which remained free. But due to religious belief, cultural practices, high level of illiteracy, low socioeconomic status of many families in Nigeria as well as poor social/health structures have been an obstacle to large scale uptake of this programme [6,8]. The HBV vaccination in Nigeria is entirely free unlike other nations like China where parents had to pay out of pocket [19]. The immunization coverage of the new born babies is therefore, unequal in Nigeria due to religious belief, cultural practices, high level of illiteracy, low socioeconomic status of many families, as well as poor social/health structures.

The policy redirection towards support for targeted immunization, awareness creation, health education and enhanced interventions for MTCT prevention could help drive down the high prevalence of HBV infection. The HBsAg positive result could represents active acute or chronic infections while, HBeAg positivity suggests active replication of the virus and a high rate of HBV infection [6,19]. The HBeAg positivity among childbearing-age women is a major determinant of in-utero and infants HBV transmission. Some previous studies have revealed that without appropriate intervention, the rate of perinatal HBV transmission can approach up to 90% in new born babies delivered to mothers who are HBsAg and HBeAg carriers [19,20].

Regular antenatal screening of pregnant women for HBV infection became routine for all antenatal clients in 2016 in the studied centre but before then it was not common and compulsory in the centre. For individuals with strong immunity status, hepatitis B vaccines could offer protection that last up to 20 years or more [5,6,19,20,22]. Despite this two decades of protection, the antibody titers against HBV can wane with time and may dip below protective levels.

The prevalence of HBsAg in pregnant women observed in this study increased with age, with the highest positivity rate in mothers aged >30 years, followed by those aged 25–29 years. Meanwhile, pregnant women aged <20 years had the lowest rates of HBV infection in our study. The finding above is similar to other studies that revealed that, the prevalence of HBV infection increased with age in both pregnant mothers and the general population [3-6,19-21,23,24]. This may be due to the progressive loss of protective antibody levels against HBV over time.

Nevertheless, the high prevalence rate of HBV in our study population remains a significant concern. This emphasizes the need for continuous routine antenatal screening for hepatis B among antenatal attendee and the good policy for implementation of appropriate measures during childbirth to reduce transmission.

5. CONCLUSION

The prevalence rate of HBV infection among pregnant women remained high during the study period. The high prevalence rate of HBV infection rate observed during this review could possibly support the high rate of infants, children and adult transmission of HBV in Benue State. This emphasizes the need for continuous routine antenatal screening for hepatis B among antenatal attendee and the good policy for

implementation of appropriate measures during childbirth to reduce transmission. Hence, to prevent and reduced the rate of mother to child transmission of HBV infection, policy makers, stakeholders as well as non-governmental organizations should intensify efforts to create and sustained awareness campaign about the dangers of hepatitis B virus infection. Also, cautious surveillance of maternal HBV infection profile should be integrated in antenatal care package for pregnant women accessing antenatal care in the studied centre and Nigeria in general. This can be done through public enlightening campaign and through global systems of mobile communication. The immunization programs targeted against HBV infection among women of reproductive age must also be strengthened.

6. LIMITATIONS

It was a retrospective study carried out in a single-center and hospital-based. Therefore, there were missing records and this could limit the capability of inferences. Second, data about vaccination information and risk factors associated with MTCT of HBV infection were not collected. Third, follow-up analysis of maternal and neonatal outcomes was not performed.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ACKNOWLEDGEMENT

It was a single-center, hospital-based, retrospective study. Therefore, selection bias might have existed as well as missing records and its capability of inferences was limited. Second, data about vaccination information and risk factors associated with MTCT of HBV infection were not collected. Third, follow-up analysis of maternal and neonatal outcomes was not performed.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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