Prevalence of Hepatitis B virus (HBV) among antenatal clinic attendees in Masaka, Karu, Local Government Area, Nasarawa state, Nigeria

Abstract

The aim of this research was to determine the prevalence of Hepatitis B virus (HBsAg) among antenatal clinic attendees in Masaka, Karu Local Government Area of Nasarawa state, North Central Nigeria. Formal consent was issued by the State Hospital Board to carry out the survey. The study which involved 200 pregnant women aged 18-45years randomly selected using a systematic random sampling technique held between the months of May-June was a cross-sectional health facility-based study. Structured questionnaire was used to generate data from respondents, after which blood samples aseptically collected were screened for hepatitis B surface antigen. Socio-demographic characteristic as well as some of the factors that influence infection was evaluated. Results obtained from this study revealed 6.5% prevalence rate of infection in the studied population. Prevalence of infection among the subjects within the age range of 35-45 years was lowest (5.8%). However, while it was 5.2% for the married, it was 6.6% for (6.6%) for the unmarried. Prevalence of infection was highest among the category with no formal education; similarly, prevalence was higher among the rural dwellers (6.8%) than their urban counterparts (5.6%). Factors examined were not statistically significant predisposing to HBV infection. In conclusion, the prevalence of HBsAg among anta-natal attendees in Masaka was (6.5%) lower than the national prevalence reported (14.1%). Owing to the outcome of this study therefore, it is recommended that improved surveillance for HBV infection and screening of women attending ANC be institute. In conclusion, although a HBV prevalence rate of 6.5% was recorded in this study, it lower that the reported national prevalence rate of 14.5% and therefore must be put in check to avoid upsurge.

Keywords: Antenatal, Hepatitis, Infection, Prevalence

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Comment [WU2]: obtained from

Comment [WU3]: ~~held~~ was conducted between the months of May-June ~~was~~ as a cross-sectional health facility-based study.

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Comment [WU6]: Spelling error

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Introduction

Viral hepatitis is such an infectious disease that results from liver inflammation caused by a virus [1]. It is considered an outstanding public health concern that affects millions of people annually. The infection is known to be responsible for health conditions such as cirrhosis of the liver and hepatocellular carcinoma (HCC) and consequently a global mortality record of over 1.4 million deaths [2]. African and Western Pacific regions account for 68% of positive cases of hepatitis B viral infection. A national survey of hepatitis B in Nigeria showed a prevalence of 12.2% in the entire population [3].

Hepatitis B is has been scientifically identified as of the one of the globally most recognized common severe infectious diseases and has been implicated in significant morbidity and mortality rate. It is transmitted through exposure to contaminated blood or body fluids, unprotected sexual contacts with an infected person, blood transfusion, use of contaminated needles, syringes, and sharp objects as well as vertical transmission from mother to child [4].

There is high risk of HBV transmission from a hepatitis B surface antigen (HBsAg) mother to a newborn [5]. Reported prevalence of HBsAg among pregnant women varies from one region to another. Although a systematic review of hepatitis B infection among pregnant women in Nigeria revealed a prevalence of 14.1%, effort to tackle this infectious disease effectively requires detailed fragmented information on its prevalence. Thus, the need for this research becomes imperative.

Masaka is a town in Nasarawa North Central Nigeria. It is a district of Karu Local Government Area of Nasarawa State and is among the towns that forms the Karu Urban area, a conurbation of towns under Karu Local Government Area of Nasarawa State. It is located at the latitude 9^0 00’ 10.80” N and longitude 7^0 40’ 14.99” E.

Comment [WU9]: Remove “such”

Comment [WU10]: Suggest to replace this epithet – it’s not suitable

Comment [WU11]: This statistic is incomplete – pl specify when

Comment [WU12]: Worldwide? Pl specify

Comment [WU13]: Mismatch with line 21

Comment [WU14]: Grammar check rrequired

Comment [WU15]: Suggest to replace with “epidemiologically”

Comment [WU16]: to remove

Comment [WU17]: contact

Comment [WU18]: “HBsAg positive” mother

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METHODOLOGY

Study location

The study was carried out in Masaka (latitude 9^0 00' 10.80" N and longitude 7^0 40' 14.99" E) Karu Local Government Area of Nasarawa state, North Central Nigeria between the month of May and June. Nigeria.

Sample size determination

Multistage sampling technique was adopted to recruit 200 pregnant women. At the preliminary stage, 12 Health Facilities (HF) that provide ANC were recruited with the aid of balloting method of simple random sampling, after which ante-natal clinic attendees that patronize the hospitals were recruited using simple systematic random sampling. Average daily attendance to ANC in the selected hospitals was relied upon to adopt a sampling interval of 10. The first attendee was sampled by balloting and subsequently every 10^{th} attendee was approached for the study till the sample size was achieved [3].

Inclusion Criteria

Pregnant Women receiving ante-natal care (ANC) at any of the selected hospitals in Masaka and within the study age group (18-45) who had not been immunized against immunization were included.

Study instrument and data collection

Semi-structured questionnaire was used with which information on the socio-demographic characteristics of the study population was collected and some of the HBV infection oriented factors such blood transfusion, surgery, and sharing of sharp objects were generated from the respondents using a semi-structured questionnaire.

Comment [WU20]: Repetition, keep this info here and remove from intro part

Comment [WU21]: by

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Sample collection

Precisely 1ml of blood was aseptically collected for hepatitis screening after the consent of the hospital management as well as that of the attendees had been sought and approval granted.

Sample analysis

Enzyme-linked immunosorbent assay (ELISA) kit produced by LabACONR (Hangzhou Biotest Biotech Co., Ltd, China) which has sensitivity and specificity of 99.9% and 99.0% respectively was employed ~~to assay~~. The manufacturer's instructions were carefully observed. The results were reported as positive or negative.

Statistical Analysis

The information obtained from the questionnaires was subjected to descriptive statistical analysis using the (SPSS version 2.80, Claremont, California USA). Chi Square test was employed to determine the relationship between the risk factors and prevalence of the infection. Values obtained were considered significant at $p < 0.05$.

Result

Two hundred (200) pregnant women were recruited for the study. Of these, 13 were confirmed positive to HBsAg accounting for 6.5% of the sample population. Information on the socio-demographic characteristics of the population (**Table 1**) indicated that HBsAg prevalence was highest among the 24-35 age categories where 8 out of the 13 women tested positive to HBsAg. The study also revealed that prevalence rate was dependent on the attendees' level of education with the highest prevalence rate of 10.71% reported for the uneducated members of the sample population. Of the 200 women examined, 181 were married, while 19 was unmarried. Reported HBV prevalence for these two categories was 12% and 1% respectively. The study further revealed prevalence rates of 6.8 % and 5.6% for the urban and rural residents respectively. Predisposing factors to HBsAg were examined (**Table 2**) 16 pregnant ANC

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Comment [WU27]: Replace with "followed"

Comment [WU28]: Place parentheses correctly

Comment [WU29]: for

Comment [WU30]: category

Comment [WU31]: Is it prevalence or prevalence rate? Should be clear

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attendees had never had surgery and none tested positive to HBsAg, while of the remaining examined 184 subjects, 13 tested positive accounting for 7.1% of the sub-population. This was not statistically significant ($\chi 2 = 1.124$, $P = 0.289$), While 12 subjects had been transfused with blood in the past and none tested positive to HBsAg, 13 subjects accounting for (7.1%) of the remaining examined 188 subjects who had never been transfused tested positive to HBsAg. This was not statistically significant ($\chi 2 = 0.826$, $P=0.363$). 12 (7.4%) out of the 161 ANC attendees who has agreed to sharing sharp objects with friends and family members tested positive to HBsAg. However, only 1 (2.5%) of the 39 attendees who had never shared sharp objects with anyone tested positive to HBsAg. This was not significant ($\chi 2=1.116$, $P= 0.290$). 30 ANC attendees had tribal marks/tattoos on one part of their body or the other, while 170 ANC attendees had no tribal mark/tattoos on any part of the body. Of the 30 attendees with tribal mark/tattoo, only 3(10%) tested positive, while 27(90%) had no had no tribal mark/tattoo. However, of the 170 ANC attendees without tribal mark/tattoo, 11(7.9%) tested positive, while the remaining 159(93.5%) tested positive. This was not statistically significant ($\chi 2= 0.608$, $P= 0435$). 11 (7.9%) out of the 138 ANC attendees who has agreed to pedicure/manicure tested positive to HBsAg. However, only 2 (3.2%) out of the 62 attendees who never had pedicure/manicure tested positive to HBsAg. This was not significant ($\chi 2=1.416$, $P=0.234$).

Comment [WU35]: Positive " for" is grammatically correct. to change wherever it has been used

Table 1. Socio-demographic characteristics of Masaka ANC attendees

Age	Number (n)	Positive	Prevalence (%)
18-24	50	3	6
24-35	106	8	7.5
34-45	44	2	4.5
Education status			
No formal education	28	3	10.71
Primary	42	3	7.14
Secondary	81	5	6.17
Tertiary	49	2	4.08
Marital Status			
Married	181	12	6.63
Single	19	1	5.26

Residence			
Rural	147	3	5.6
Urban	147	10	6.8

Table 2: Factors predisposing pregnant women to HBsAg

Factors	Number(n)	HBsAg (+)	HBsAg (-)	X^2	P-value
Surgery					
Yes	16	0(0)	16(100)	1.124	**0.289**
No	184	13(7.0)	171(92.9)		
Blood Transfusion					
Yes	12	0(0)	12(100)	0.826	**0.363**
No	188	13(7.1)	175(95.6)		
Sharing of sharp objects					
Yes	161	12(7.4)	149(92.5)	1.116	**0.290**
No	39	1(2.5)	38(97.4)		
Tribal marks/tattoos					
Yes	30	3(10)	27(90)	0.608	**0.435**
No	170	11(6.4)	159(93.5)		
Pedicure/manicure					
Yes	138	11(7.9)	127(92.0)	1.416	**0.234**
No	62	2(3.2)	60(96.7)		

Discussion

Although national survey on seroprevalence of hepatitis B infection confirms that HBV infection is highly endemic in Nigeria accounting for prevalence in the neighborhood of the estimated prevalence reported for sub-Saharan Africa [6], tackling the menace requires a clear ~~cut~~ view of the prevalence obtained when varying dimensions of the bulk information are revealed. Hepatitis B virus infection can lead to maternal morbidity and mortality. It also has the potential to cause chronic infection in newborn. Aside the fact that the prevalence of HBV infection varies in different parts of the world, regional and population specific variation also abound. Suppression

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Comment [WU37]: Grammatically incorrect

of the immune system that characterises pregnancy is clinically and epidemiologically significant during hepatitis B virus infection among pregnant women. In most epidemiological studies on HBsAg, there has been a link between age and acquisition of HBsAg. The age of acquiring the infection is one of the major determinants of the prevalence rate of HBsAg. In this study, HBsAg was highest among 25-35 years age categories. The study is consistent with the finding from the study of Habiba and Memon [7] where majority of those that tested positive were in the age range of 25-35. This may be attributed to the fact that most women in Nigeria nowadays marry within this age range and become pregnant and consequently resumes ante-natal which exposes them to HBV screening and identification. Highest prevalence was reported for the "no formal education" (10.71%) while the least prevalence was recorded for the most "educated group" (4.08%) of the study population. Reduction in prevalence with respect to the aforementioned category was reported in the order thus: no formal education<primary<secondary<tertiary. This may be as a result of increased awareness on the causes and prevention of infection among the educated group. This finding however contradicts the result of Eke et al [8] which reported the least prevalence among the "no formal education category"

Unprotected sex is known to be a means of transmission of HBV, and marriage provides a means of unprotected sex, which could increase the chances of exposure and transmission of HBV. In this study, the prevalence of HBV among the married was higher (6.63%) than that recorded for the single (5.26%). This is consistent with the outcome of a prevalence study among married and unmarried students by Bhattarai et al [9] which revealed a higher prevalence of HBsAg for the married students than the single students. From this study, it was noted that all predisposing factors examined were not statistically significant predisposing factors to HBV infection. This is consistent with the findings of Akani et al [10] which claim that previous

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Comment [WU39]: "no formal education" category while the…

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histories of tribal marks/tattoos, previous contact with hepatitis B infected persons, previous histories of surgery/dental manipulations and blood transfusion were statistically significant predisposing factor to HBsAg infection. The study also revealed a higher prevalence for the rural dwellers (6.8%) and 5.6% for the urban dwellers. This may be attributed to poor sanitary conditions, lack of infrastructural development and insignificant presence of the government in the rural areas.

Comment [WU43]: Restructure this – lacks clarity, also appears contradictory

Conclusion

In conclusion, although a HBV prevalence rate of 6.5% was recorded in this study, it lower that the reported national prevalence rate of 14.5% and therefore must be put in check to avoid upsurge.

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