



SEROPREVALENCE OF HEPATITIS B SURFACE ANTIGENAEMIA AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT GENERAL HOSPITAL ALIERO, KEBBI STATE, NORTHERN - NIGERIA

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ABSTRACT

Infection with Hepatitis B virus (HBV) is a serious public health problem worldwide, with over 360 million carriers. Sixty million of these are resident in Sub-saharan Africa. A total of 200 consented pregnant women subjects were recruited for this study to determine the sero-prevalence of Hepatitis B surface antigenaemia among pregnant women attending antenatal clinic at General Hospital, Aliero, Kebbi State, Nigeria. A structured questionnaire was used for the data collection. Sera were collected and tested for hepatitis B surface antigen (HBsAg) using commercial rapid diagnostic test strip. A prevalence rate of 8.50% among all pregnant women studied was found. All the HBsAg sero-positive/negative women that attended the antenatal clinic during this study were found be married. On sociodemographic characteristics/ risk factors, there was no statistical significance difference between the women with HBsAg positive sera and those without the infection, with respect to age group (P value = 0.473), Education (P value = 0.484), Economic status (P-value = 0.052), Number of sexual partner(s) (p value = 0.082) and Sharing of sharp objects (P value = 0.619). However, there was statistically significant difference among women base on blood transfusion(s) (p value = 0.008) and vaccinated (p value = 0.001). The prevalence of hepatitis B infection is very high among pregnant women at General Hospital Aliero as in the high endemic zone that is more than 7%. However the prevalence rate is lower than the national average of 11%. The infection has zero (0%) prevalence among the women who received vaccination. This suggest the need for improved maternal health, routine immunization HBV screening among pregnant women in central Nigeria.

Keywords: Hepatitis B virus, Sero-prevalence, Hepatitis B surface antigen (HBsAg), Antenatal, Aliero

INTRODUCTION

There are over 2 billion people estimated to be living with the hepatitis B virus globally, while around 360 million are chronically infected and at risk of developing life-threatening liver disease (WHO, 2009). Sixty millions of these chronically infected reside in sub-Saharan Africa. Up to a quarter of these chronically infected individuals may die as a result of the infection (WHO, 2009).

Hepatitis B infection can be transmitted by many ways. The pattern of transmission depends on the number of chronic carriers in the community (Baawuga *et al.*, 2008; Dutta, 2009). In areas where it is endemic such as Sub-Saharan Africa, transmission is mainly either vertical, from a carrier mother to her newborn, or through close contact between children (Dutta, 2009). Perinatal transmission of HBV occurs mainly during or soon after delivery, through contact of the infant with maternal blood and other body

fluids (WHO, 2006). Breast milk has not been implicated as a major source of vertical transmission but mothers who are carriers are encouraged not to wet-nurse other babies but can breast feed their own children (WHO, 2006). Mothers who are carriers with the "e" antigen positive have a 90% chance of infecting their new born (Hadziyannis, 2011). It has been indicated that children infected before 1 year have a 90% chance of developing to chronic stage of the infection and only 10% of those infected at adulthood are likely to become chronic carriers (Hadziyannis, 2011). WHO has suggested that the major intervention that need to be taken to reduce hepatitis B infection is by having a wider coverage of infant vaccination (Mannava and Morgan, 2012). Vaccination reduces the risk of developing hepatitis B infection among infants of hepatitis B positive mothers by about 4 times (Mannava and Morgan, 2012).

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Several interventions have been shown to reduce the incidence of vertical transmission. These include the use of antiviral such as tenofovir at the third trimester - if viral load is more than 1×10^7 copies/ml- and vaccinating the child with both immunoglobulin and antigen soon after birth but within 24 h of birth (Celen *et al.*, 2013). In the General Hospital Aliero such interventions are not available because there is no routine screening of pregnant women for hepatitis B infection. Even the routine dose of hepatitis B vaccine that is usually given a week after delivery is not always administered and babies born to infected mothers need these interventions hence the need for a study to show the burden of the problem.

The current study aimed at determining the sero-prevalence of hepatitis B virus among pregnant women attending the antenatal clinic at General Hospital Aliero, Kebbi State, Nigeria. This will help policy makers to effectively plan to reduce the prevalence of hepatitis B in the study population. This data will also help programme managers and health planners, to plan vaccination and other preventive measures or strategies (Wright, 2006). It will also show the importance of hepatitis B Surface antigen screening of pregnant mothers as another intervention towards the reduction of hepatitis B transmission.

MATERIALS AND METHODS

Study location

The study was conducted at General Hospital Aliero, Kebbi State, Nigeria. This is one of the Secondary Hospital in Kebbi with a 50-bed capacity. It serves people from aliero local government and its neighborhoods. Antenatal clinics are held on Tuesdays with clients numbering around 30 every week. The antenatal clients seen are normal antenatal cases as well as high risk obstetric patients. Every pregnant woman booking or continuing for antenatal care at the study location was counseled for Hepatitis B virus testing, during the study period. The pre-testing counseling was done in groups, while the post-testing counseling was done individually. Pregnant women were evaluated by history, examination, and blood test for serum HBsAg using immunographic rapid point of care test.

Ethical Approval

Ethical approval to conduct this research was obtained on the 2nd May, 2019 with the reference number KB/MOH/19/007 from Research and Ethics Committee of the Kebbi State Ministry of Health.

Study design

This was a cross sectional study to determine the prevalence of the HBsAg among pregnant women attending antenatal clinic at General Hospital Aliero, Kebbi State, Nigeria. All pregnant women registering for ANC were recruited, whenever consent is given.

Study population and duration of Investigation

The study population was pregnant women attending antenatal clinic in the hospital. All mothers who came for antenatal booking were counseled for hepatitis B screening in addition to the routine screening. Those who consented to be a part of the study were recruited into the study. The study was conducted from 3rd June to 29th August, 2019. Participants were recruited from the antenatal Clinic of the hospital.

Inclusion and Exclusion criteria

All pregnant women who came for their first visit to the antenatal clinic were told about the study and those selected were recruited if they consented to be a part of the study. The following category of women were excluded from the study: Any pregnant woman who declined to be part of the study. Any woman already in labour. Any woman who came for follow up antenatal care. Women who are not pregnant.

Sample collection and Laboratory Method

Every eligible pregnant woman was counseled on the objectives of the study, and consent form was administered after ensuring that the participant fully understood the concept of the research. The mothers were tested at the counseling room after 2mls of venous blood was collected using HBsAg rapid immune-chromatographic test. Their results were discussed with them before they leave.

Statistical Analysis

All analyses were done using Statistical Program for Social Sciences (SPSS). Univariate analyses were done to determine the relationship between the HBsAg infection and associated risk factors. Chi square at significant level of 0.05 and confidence level of 95% were used to determined significance.

RESULTS

Out of the 200 pregnant women screened during this study 17(8.5) (Table 1) were seropositive for HBsAg. The highest proportion of HBsAg seropositive women (10.2%) was recorded among age group 26-35 years of age (Table 2), there was no statistically significant differences between the age groups participants that are seropositive for HBsAg and those who were negative for the virus (*P value* = 0.473).

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Examination of other sociodemographic characteristics, shows that there were no significant difference found between the women with HBsAg sero-positivity and those without the infection with respect to marital status (Table 3), with *P value* = 0.899) and Education (Table 4) with *P value* = 0.484, Economic status (Table 5),

with *p value* = 0.052, Number of sexual partners (Table 6) *P value* = 0.082, but a significant differences was demonstrated among women with history of multiple Blood transfusion (Table 5), *P value* = 0.008; sharing of sharp objects (Table 8) *p value* = 0.001 and history of vaccination (Table 10) *P value* = 0.001).

Table 1: Seroprevalence of HBsAg by Demographics & Risk Factors among women attending antenatal care at General Hospital Aliero, Kebbi State, Northwestern - Nigeria.

Variables	Total No. of suspected HBV	HBsAg positive (%)	HBsAg Negative (%)	χ^2 value	<i>P-value</i>
Age					
14 – 25	137	12(8.8)	125(91.2)	1.50	0.473
26 – 35	49	5(10.2)	44(89.8)		
≥ 36	14	0(0)	14(100)		
Total	200	17(8.5)	183(91.5)		
$X^2 = 1.50, df = 2, P\text{-value} = 0.473, \alpha^2 = 0.05$					
Marital status					
Single	0	0	0	<i>NA</i>	<i>NA</i>
Married	200	17(8.5)	183(91.5)		
Divorced	0	0	0		
Widowed	0	0	0		
Separated	0	0	0		
Total	200	17(8.5)	183(91.5)		
<i>NA</i>					
Education level					
None	86	10(11.6)	76(88.4)	2.45	0.484
Primary	68	5(7.4)	63(92.6)		
Secondary	38	2(5.3)	36(94.7)		
Tertiary	8	0(0)	8(100)		
Total	200	17(8.5)	183(91.5)		
$X^2 = 2.45, df = 3, P\text{-value} = 0.484, \alpha^2 = 0.05$					
Socioeconomic status					
Poor	134	15(11.2)	119(88.8)	3.79	0.052
Rich	66	2(3.0)	64(97)		
Total	200	17(8.5)	183(91.5)		
$X^2 = 3.79, df = 1, P\text{-value} = 0.052, \alpha^2 = 0.05$					
History of Blood Transfusion					
None	131	10(7.6)	121(92.4)	11.8	0.008
Once	63	5(7.9)	58(92.1)		

Variables	Total No. of suspected HBV	HBsAg positive (%)	HBsAg Negative (%)	χ^2 value	P-value
Twice	5	1(20)	4(80)		
≥ Three times	1	1(100)	0(0)		
Total	200	17(8.5)	183(91.5)		
$\chi^2 = 11.8, df = 3, P\text{-value} = 0.008, \alpha^2 = 0.05$					
No. of Sexual Partners					
Single	170	12(7.1)	158(92.9)	3.03	0.082
Multiple	30	5(16.7)	25(83.3)		
Total	200	17(8.5)	183(91.5)		
$\chi^2 = 3.03, df = 1, P\text{-value} = 0.082, \alpha^2 = 0.05$					
Sharing of Sharp Objects					
Yes	168	15(8.9)	153(91.1)	11.9	0.001
No	32	2(6.3)	30(93.7)		
Total	200	17(8.5)	183(91.5)		
$\chi^2 = 11.9, df = 1, P\text{-value} = 0.001, \alpha^2 = 0.05$					
Vaccination History					
Yes	78	0(0)	78(100)	11.9	0.001
No	122	17(13.9)	105(86.1)		
Total	200	17(8.5)	183(91.5)		
$\chi^2 = 11.9, df = 1, P\text{-value} = 0.001, \alpha^2 = 0.05$					

DISCUSSION

The classification of high endemicity from HBV infection has been defined as HBsAg greater than 7% in an adult population (Uneke *et al.*, 2005). The HBsAg seropositivity of 8.5% among pregnant women in Aliero obtained in this study shows that Aliero like other areas in Nigeria is endemic for HBV infection. This result is in conformity with the similar findings of Olinger, (2008) who found 8.2% among pregnant women in Zaria, Kaduna State, Nigeria. This findings also coincides with the work of Juszozyk (2000) who reported earlier that the global prevalence of chronic HBV infection varies in order; highest Africa, Asia, West pacific (>8%) to intermediate (2-7%) in southern and Eastern Europe and lowest (< 2%) in Western Europe, North America and Australia. The prevalence rate in this study is lower than the national prevalence which was 11% (Baawuga *et al.*, 2008). Also lower than another study in Burkina Faso with a very high prevalence rate of 17.3% (Collenberg *et al.*, 2006). Our prevalence rate is

also far higher than some other East African countries such as Sudan (5.6%) (Elsheikh *et al.*, 2007), Uganda (4.9%) and Rwanda (2.4%) (Pillo *et al.*, 2007).

The distribution of HBV infection according to age indicate that the age group 26-30 years recorded the highest rate of infection (10.2%) and this could be attributed to the fact that age (26-30 years) are sexually active and may have been carrying out unprotected sex with multiple partners. This prevalence, however, is at variance with that of other studies where the highest prevalent rates were reported among those 46 years and above studies have revealed that common route of HBV transmission is through blood transfusion and unprotected sex (El-Deeb *et al.*, 2008).

A significance relationship was found between sharing of sharp objects and occurrence of the HBV infection (p value = 0.002). Those that share sharp objects had an extremely higher prevalence of HBV infection (8.9%), Compared to those who do not share (6.25%).

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This concurs with the reports which suggests that sharing of sharp objects or needles is a possible route of HBV transmission due to its high infectious potential (Samuel *et al.*, 2009).

In the current study the chances of HBV infection increases with decrease of level of education and socioeconomic status, none educated women had the highest prevalence of 11.6%, primary (7.4%). Secondary (5.3%), while those who attend tertiary level of education have the lowest (0%). This could be attributed to the lack of education, awareness about the HBV infection and good personal hygienic practice among uneducated individuals. Several studies have reported that poor hygiene practice and lack of awareness about HBV have contributed significantly to high rate of infection amongst populace (Kurbanov *et al.*, 2010). The level of education, probably a surrogate of low socioeconomic status, reflects poor knowledge about prevention as well as poor access to health services, which lead to greater susceptibility to infection.

On the basis of sexual partners, those with multiple sex partners had highest prevalence of 16.7%, which could be due to the fact that, this group of women having sex with multiple partners without any form of protection, which could be out of ignorance about the possible route of HBV transmission.

Married women exhibited a very high risk of HBV infection in our study; this finding suggests that acquisition of HBV infection which may be related to sexual lifestyle, influenced by possibility of sharing husband with co-wives as well as having unprotected sexual intercourse cuts across all categories of participants irrespective of status. This is similar to the works by Adegbsan-omilabu *et al.*, (2015), where a significantly high prevalence of HBsAg were reported among the married, pregnant women compared to their single counter parts.

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However, a significant association was observed in the current study between history of blood transfusion and development of HBV infection (p value = 0.008). This high risk of infection among women with, past history of blood transfusion(s) additionally underlined the presence of non-safe blood transfusion screening administration among our health care facilities in Nigeria. In spite of the fact that screening for normal blood borne infection are drilled in Nigerian hospitals, more consideration should be given to include molecular technique (PCR) as part HBV screening before Blood transfusion.

There were zero cases of hepatitis B among vaccinated pregnant women that participated in this study and this result was consistent with the expectation that this event is uncommon among vaccinated individuals and common within unvaccinated individuals in highly endemic areas. The intervention to stop vertical transmission can only be applied when the status of the pregnant woman is known. Mother-to-child transmission can be avoided by vaccination of the newborn. There is an urgent need to vaccinate all infants born to mothers who are carriers of HBsAg.

CONCLUSION

The seroprevalence of HBV infection is high in among pregnant women in Aliero. The findings guide the need for routine HBV screening among pregnant women at some stage in antenatal care within the region and Nigeria. It also form a base for continual immunization campaign amongst rural/Urban pregnant women in Northwest and other parts of Nigeria.

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Conflict of Interest

All authors declare no conflict of interest.

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