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Research Article



Seroprevalence of Hepatitis B virus among pregnant women attending state specialist hospital Maiduguri

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Abstract

The prevalence of hepatitis B virus (HBV) infection among pregnant women was determined using Acon HBsAg in vitro diagnostic kit. Of the one hundred and eight (108) pregnant women tested for hepatitis B surface antigen (HBsAg) only 7(6.5%) were positive. Higher prevalence of HBV was recorded among pregnant women between age group 20-24years 3(8.3%), followed by 30-34years 2(7.4%), 25-29year and 35-39years with the prevalence of 1(4.8%) and 1(12.5%) respectively. HBV among pregnant women based on educational status showed that out of 108 pregnant women, only 47(43.5%) were undergone formal education while 61(56.5%) have not undergone formal education. High prevalence was recorded among those that have not undergone formal education 4(6.6%) than their counterpart with formal education 3(6.4%), although, no statistical significant difference was recorded between the educational status of the studied population and the prevalence of the HBV infection(X-squared= 0.1279, df= 1, p-value= 0.7206). Also other variable such gravidity, trimester and history of blood transfusion were observed in this study, none of this variable was found to be risk factor acquiring HBV infection (P>0.05). This shows that Hepatitis B virus is endemic in pregnant women and evidence of this virus among pregnant women, indicating high risk of vertical transmission.

Keywords: Prevalence, HBV, Pregnant Women and Hospital

Introduction

Hepatitis is a disease of the liver usually caused by viral infections but may also be due to an autoimmune response (Alberti *et al.*, 1999). HBV infection among pregnant women is an important issue since many newborn infants contract this infection from their infected mothers. Intrauterine infection with HBV may lead to perinatal transmission. HBV is a serious disease of mankind and constitute a global public health problem (Obi *et al.*, 2006). Routes of infection include vertical and horizontal transmission (Custer *et al.*, 2004). Hepatitis B. Virus (HBV) infection has been reported as the most common cause of serious liver infection in the world (Uneke, 2005). The infection has consequently been referred to as a public

health problem worldwide (Vazquez and Martinez, 2003). The disease has caused epidemics in parts of Asia and Africa, and it is endemic in China (Williams, 2006). According to the recent world health organization report, about a third of the total world's population, more than 2 billion people have serologic evidence of past or present hepatitis B virus infection (Chang, 2007) and this include about 350 million chronic carriers of the virus. In moderate prevalence areas, which include Eastern Europe Russia and Japan about 2 – 7 of the population is chronically infected with the disease spreading predominantly among children. In high prevalence area such as China and South East Asia, transmission during childbirth is

most common, although in other areas of high endemicity such as Africa transmission during children is also a significant factor (Alter, 2003). Nigeria, a tropical country, has been documented as highly endemic for HBV infection and about 75% of its population is likely to have been exposed to the virus at one time or the other in their lives (Sirisena *et al.*, 2002). Transmission of HBV from carrier mothers to babies can occur during perinatal period, and is important factor in determining the prevalence of infection in highly endemic areas. Before HBV vaccine was integrated into the routine immunization programme, about 10% to 30% babies were becoming HBV carriers amongst mothers who were HBsAg positive but HBeAg negative (Khakhkhar *et al.*, 2012). The chronically infected person is at high risk of death from liver cirrhosis and liver cancer a disease that kills about one million people every year. In an endemic areas, where the rate is 55% most individual are infected from a carrier mother to her baby through placenta and during delivery (vertical transmission) or in early childhood while horizontal transmission is also possible among children, families and close personal relations (Wright, 2006) without intervention a mother who is positive for HbsAg has a 20% risk of passing the infection to her offspring at the time of birth. If a pregnant woman is on HBV carrier and also HBeAg positive, her newborn baby has 90% likelihood to be infected and become a carrier of these children 25% will die later from chronic liver disease or liver cancer (Hollinger *et al.*, 2001). The dangers inherent in the observed cases of hepatitis are legion and call for conscious effort to address them especially as it has been reported that infection acquired in early childhood is usually asymptomatic, becoming chronic while, in those that experience the disease symptoms, the aftermath of the hepatic damage various widely. Therefore, this study was aimed to determine the prevalence of HBV among pregnant women attending Specialist Hospital Maiduguri, Borno State, Nigeria.

Materials and Methods

Study Area

This study was carried out in the antenatal ward of State Specialist Hospital in Borno State. Borno State is situated in the North -Eastern part of Nigeria which lies between latitude 10°N and 13° E. It shares boundaries with the Republic of Niger to the North, Chad to the North-East and Cameroon to the East. It also shares boundaries with Adamawa to the South,

Yobe to the West and Gombe to the South West. Borno state has an area of 69, 435 square kilometers about 7.69% of the total land area of the country. The 2006 census figure has the state population of 4,151, 193 with population density of approximately 60 inhabitants per square to meter (NPC, 2006).

Questionnaire

Questionnaire was used in this study to obtained information on socio-demographic variable which considered as a risk factor for acquiring Hepatitis B virus infection. The information includes age, educational status, gravity, trimester and history of blood Transfusion.

Collection of samples

Five (5) millimeters of blood was collected aseptically from each subject using vein puncture transferred into an EDTA (Ethylene Diamine tetra Acetic acid) container. The blood samples collected were labeled appropriately with the patient identity and store in the refrigerator for further analysis.

Study Population

One hundred and eight (108) blood samples were collected from pregnant women attending antenatal at State Specialist Hospital Maiduguri, Borno State

Determination of HbsAg

Rapid test was used to determine HbsAg which is a qualitative solid phase. The membrane is pre-coated with anti-HBs Ag antibodies on the test line region of the test strip. During testing, the whole blood serum specimen reacts with anti- HbsAg antibodies conjugated particles. The mixture migrates upward on the membrane and generates colored lines.

Statistical Analysis

Pearson – Chi-square was used to determine the relationship between HBV infection and socio-demographic variable using statistical package (R version 2.13.1)

Results

Out of the 108 pregnant women attending State Specialist Hospital that were screened for HBV, only 7 (6.5%) were positive. Higher prevalence of HBV was recorded among pregnant women between age group

20-24 years 3(8.3%), followed by 30-34 years 2(7.4%), 25-29year and 35-39 years with the prevalence of 1(4.8%) and 1(12.5%) respectively. However no statistically significant difference was

recorded between the prevalence of the viral infection and the different age group (X-square= 1.9313, df= 5, p- value = 0.8586) (Table 1).

Table 1: Distribution of Hepatitis B virus among pregnant women attending State Specialist Hospital Maiduguri Based on age

Age	Total (%)	Positive	Positive (%)
13- 19	15(13.9)	0	0.0
20- 24	36(33.3)	3	8.3
25- 29	21(19.4)	1	4.8
30- 34	27(25.0)	2	7.4
35- 39	8(7.5)	1	12.5
40- 44	1(0.9)	0	0.0
Total	108(100)	7	6.5

(X-square= 1.9313, df= 5, p- value = 0.8586).

The distribution of hepatitis B virus among pregnant women based on educational status showed that out of 108 pregnant women tested for HBV, only 47(43.5%) were undergone formal education while 61(56.5%) have not undergone formal education. High prevalence was recorded among those that have not undergone

formal education 4(6.6%) than their counterpart 3(6.4%), although, no statistical significant difference was recorded between the educational status of the studied population and the prevalence of the HBV infection(X-squared= 0.1279, df= 1, p-value= 0.7206) (Table 2).

Table 2: Distribution of Hepatitis B virus infection among pregnant women attending State Specialist Hospital Maiduguri based on educational Status

Educational Status	Total (%)	Positive	Positive (%)
Formal Education	47(43.5)	3	6.4
Non-Formal Education	61(56.5)	4	6.6
Total	108(100)	7	6.5

(X-squared= 0.1279, df= 1, p-value= 0.7206)

The distribution of HBV infection based on gravidity showed that high prevalence of 5(7.7%) was recorded among Multigravidae than Primigravidae, although, no

statistical significant difference was recorded between the gravidity of the studied population and the prevalence of the HBV infection (Table 3).

Table 3: Distribution of Hepatitis B virus infection among pregnant women attending State Specialist Hospital Maiduguri based on gravidity

Gravidity	Total (%)	Positive	Positive (%)
Primigravidae	43(39.8)	2	4.7
Multigravidae	65(60.2)	5	7.7
Total	108(100)	7	6.5

(X-squared= 0.0525, df= 1, p-value= 0.8187)

The distribution of HBV according to trimester was analysed and the result was shown on Table 4. Higher prevalence of HBV was recorded among pregnant women who were in second trimester 6(9.2%), followed by those in third trimester 1(10%) while

those in first trimester have zero prevalence rate. However, no statistical significant difference was recorded between the trimester of the studied population and the prevalence of the HBV infection (Table 4).

Table 4: Distribution of Hepatitis B virus infection among pregnant women attending State Specialist Hospital Maiduguri based on trimester

Trimester	Total (%)	Positive	Positive (%)
First Trimester	33(30.6)	0	0.0
Second Trimester	65(60.2)	6	9.2
Third Trimester	10(9.2)	1	10.0
Total	108(100)	7	6.5

(X-squared= 3.3019, df= 2, p-value= 0.1919)

Out of the 108 pregnant women whom participated in this study, 40(37.0%) had history of blood transfusion. HBV was found to be more prevalent among people that have no history of blood transfusion 5(7.4%) than those that have history of blood transfusion 2(5.0%).

However, no statistical significant difference was recorded between the history of blood transfusion of the studied population and the prevalence of the HBV infection (Table 5).

Table 5: Distribution of Hepatitis B virus infection among pregnant women attending State Specialist Hospital Maiduguri based on history of bloods transfusion

History of Blood Transfusion	Total (%)	Positive	Positive (%)
Yes	40(37.0)	2	5.0
No	68(63.0)	5	7.4
Total	108(100)	7	6.5

(X-squared= 0.0056, df= 1, p-value= 0.9403)

Discussion

Hepatitis B virus infection among pregnant women may result in severe disease to mother and chronic infection to the newborn. In this study, a seroprevalence of HBsAg among pregnant women attending State Specialist Hospital Maiduguri is 6.5%. This showed an intermediate endemicity of HBV infection according to World Health Organization criteria (WHO) (WHO/EPI 1990). The implication of this finding is that, there is possibility of vertical transmission of Hepatitis B virus among the pregnant women that tested positive for HBsAg, and infected newborn most often remains chronic carrier with the consequences of liver cirrhosis and hepatocellular carcinoma later in life. This result agrees with

Alegebeleye *et al.* (2013) who reported prevalence 6.0% of HBV among the pregnant women attending University of Port Harcourt Teaching Hospital. This result obtained is higher than the 3.9% rate obtained in the studies from Southwest Nigeria by Ajaye *et al.* (2013) at Ekiti state University Teaching Hospital. This prevalence of HBsAg from this study is lower than 7% prevalence rate reported in Southwestern Nigeria by Opaleye *et al.* (2010) at tertiary health institution.

The distribution of hepatitis B virus infection among pregnant women based on age has the highest infection between 20-24 years with 3(8.3%) followed by 30-34 with 3(7.4%), 25-29 with 1(4.8%) and 35-39 with 2(7.4%). Based on educational status, 47 (43.5%)

is found to have formal education with prevalence of 3(6.4%) and 61 (56.5) non formal education with prevalence rate of 4 (6.6%). However, the highest prevalence of HBV is found to be higher among pregnant women with no formal education. This agreement with that of Alegbeleye *et al.* (2013) who showed that educational attainment did not reduce the risk factor for transmission of the infection. This infection is high among Multigravidae which is found to be 5 (7.7%) than that of Primigravidae 2 (4.7%). The differences could be due to repeated risk of exposure to contaminated surface and instrument during delivery. In addition, the prevalence of HBV among pregnant women with no history of blood transfusion is higher with 5 (7.4%) and those with history blood transfusion is 2(5.0%).

Conclusion

Out of the 108 pregnant women attending State Specialist Hospital that were screened for HBV, only 7 (6.5%) were positive while 101 were negative for hepatitis B virus infection. This shows that Hepatitis B virus is endemic in pregnant women and evidence of this virus among pregnant women, indicating high risk of vertical transmission.

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