

Prevalence of Hepatitis B Virus Infection among Pregnant Women Attending Antenatal Clinic at General Hospital Calabar, Cross River State

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Abstract: Hepatitis B virus (HBV) infection in Nigeria has remained a public health issue and a major cause of mortality especially in developing countries. Vertical transmission of hepatitis B virus infection is thought to be one of the major routes of transmission in developing countries. In spite of this, routine antenatal screening for hepatitis infection is not yet practiced in many Nigerian hospitals. This study was undertaken with the aim of determining the prevalence of HBsAg antibodies among women attending ante-natal clinic at General Hospital Calabar, Cross River State, Nigeria. A total of one hundred and fifty women were recruited for this study between January and March, 2012 and were screened for anti-HBsAg antibodies using the one step rapid HBsAg Test Kit (Hypertec. Diagnostic, Germany). The anti-HBsAg prevalence was determined to be 4% ($\frac{6}{150}$) with the highest prevalence (7.14%) recorded in pregnant women aged 26-30 years. The trimester related prevalence of HBsAg was highest (5.88%) among women on their 2nd trimester. Statistical analysis revealed that age and trimester were not statistically associated ($P > 0.05$) with HBsAg antibodies prevalence. The findings of high prevalence of HBsAg in antenatal women in their 2nd trimester during which the fetus undergo certain developmental processes possess high risk to the developing fetus.

Keywords: HBV, Cirrhosis, hepatocellular carcinoma

INTRODUCTION

Hepatitis B virus (HBV) infection, one of the common infectious diseases in the world and a public health problem, infect the liver of hominidea including humans causing inflammation (hepatitis) and is 50-100 times more infectious than HIV and ten times more infectious than hepatitis C virus (HCV), with many carriers not realizing they are infected with the virus, thus referred to as silent killer (Samuel *et al.*, 2004). It is estimated that more than two billion people have been infected with HBV worldwide and 350 million people have the chronic infection (Uneke, *et al.*, 2005). The seropositive for HBsAg transmit the virus to neonates but in women who are seropositive for both HBsAg and HBeAg, vertical transmission is approximately 90% (Vranckx, *et al.*, 1999). Infection could be acute when it lasts less than six months and often leads to cirrhosis and hepatocellular carcinoma while the highest risk (80-90%) of chronic infections have been found among infected neonates born to HBeAg positive carrier mothers followed by 30% of children infected before six years of age (Hyams, 1995).

Acute infection in pregnancy has been shown to induce premature labour with its attendant effects including intraventricular hemorrhage (Gambarin-Gelwan, 2007, Tse, *et al.*, 2005) and intra-partum and post-partum haemorrhage from coagulation failure due to inadequate vitamin K dependent clotting factors production especially when prothrombin time is prolonged as in fulminant hepatic failure during chronic infections.

Cirrhosis defined as a major secondary manifestation of HBV is usually apparent characterized by replacement of liver tissue by Fibrosis and regenerative modules often complicated with Ascites, caput medusa, hepatic encephalopathy and portal hypertension is defined as a primary manifestation of chronic HBV infection. This research therefore is necessitated because of the high rate of miscarriages and pre mature births among all groups of child bearing women in this country.

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MATERIALS AND METHODS

Sites and Subjects

This study was carried out in General Hospital, Calabar in Cross River State Nigeria and samples collected from chemical pathology lab in the same hospital which is one of the principal health care institutions in the state.

The study subjects consisted of 150 pregnant women attending antenatal clinic in General Hospital Calabar between the months of January to March, 2012 and aged 15 – 42 years with most showing no apparent clinical symptoms suggestive of HBV.

The subjects were divided into three groups based on the age of their pregnancies as well their individual ages.

Selection of Subjects

All pregnant women attending ante-natal clinic at General Hospital located in Calabar Metropolis were eligible for the study. Participation was voluntary and each subject involved in the study gave a consent. Recruitment was by a simple random sampling method. Only three of the subjects reported a history of previous screening for HBV infection, all other participants were not aware of their hepatitis status including HBV prior to this study.

These who gave informed consent had 3-5ml of venous blood collected from them. Collected blood samples were dispensed into pre-labeled dry bottles and allowed to clot naturally and then separated by centrifuging at 2000rpm for 10 minutes followed by a second centrifugation at 3500rpm for 10minutes. Separated aliquots of sera were transferred into clean bottles and refrigerated until required for us.

Materials

The materials employed for this research study followed proper analytical procedures and were obtained from reputable scientific laboratories. The materials were Rapid HBsAg test strip (Hypertec. Diagnostic Germany), specimen collection bottles,

Timer, Centrifuge, needles, syringes, cotton wool methylated spirit, micropipettes.

Screening Test for Anti HBV

Each serum sample was screened in turn for anti-HBV using Hypertec. Diagnostic (Germany), a one step rapid anti HBV test kit based on the principle of membrane based immunoassay (Mbamara and Obiechina, 2010). The test kits manufacturer's instructions were strictly adhered to.

Statistical Analysis of Data

The quantitative variables were summarized using range, mean, simple percentage to evaluate the frequency of prevalence. The relationship between age and trimester was tested in line with the subjects that tested negative to HBsAg antibodies using fisher exact test. The odd's ratio (O.R), p-value and confidence interval (C.I) at 95% level of confidence were also obtained. The level of significance was set at $p < 0.05$.

RESULTS

Prevalence of Anti-HBV among study Subjects According to Age and Trimester

The data obtained showed 7.14% ($3/42$) for subjects within the age range of 26-30 years, 3.85% ($1/26$) for subjects within the age range of 31-35 years and 4.55% ($1/22$) for subjects within the age range of 36-40 years. The results are presented in Table 1. Statistical analysis of the data showed no significant association ($P > 0.05$) between anti-HBV antibodies prevalence and age of the subjects. Similarly, 42.67% (64/150) of subjects in their 1st trimester (1-3 months), 22.6% (34/150) of subjects in their 2nd trimester (4-6 months) and 34.67% (52/150) of subjects in their 3rd trimester (7-9months) were tested. The data obtained showed that 1.56% (1/64) in the 1st trimester. 5.88% (2/34) in their 2nd trimester and 5.77% (3/52) in their 3rd trimester tested positive. The results are presented in Table 2. Statistical analysis of the data revealed no significant association ($P > 0.05$) between anti-HBsAg antibodies prevalence and trimester of study subjects.

Table 1: Prevalence of HBsAg Among study Subjects According to Age

Age	No Tested % (n=150)	No positive % (n=6)	No Negative % (n=144)	C.I (95%)	Odd's ratio	P-value
15-20	13 (8.67)	0 (0.00)	13 (100)	0.00	0.00	0.628
21-25	26 (17.33)	1 (3.85)	25 (96.15)	0.0165- 2.0210	0.9501	0.462
26-30	42 (28.00)	3 (7.14)	39 (92.85)	0.6023- 6.1543	2.6018	0.233
31-35	37 (24.67)	1 (2.70)	36 (97.30)	0.0812- 3.1432	0.4127	0.325
36-40	22 (14.67)	1 (4.55)	21 (95.45)	0.5262- 2.9431	1.6253	0.2356
41-45	10 (6.67)	0 (0.00)	0 (0.00)	0.00	0.00	0.771
Total	N = 6 (4)	N = 144 (96)				

$P = 0.57$ ($P > 0.05$) Insignificant

Table 2: Prevalence of HBsAg According to Trimester of Study Subjects:

Trimester	No Tested % (n=150)	No positive % (n=6)	No Negative % (n=144)	C.1 (95%)	Odd's ratio	P-value
1 st trimester (1-3months)	64 (42.67)	1 (1.56)	63 (98.44)	0.0116- 2.3161	0.2561	0.611
2 nd trimester (4-6 months)	34 (22.67)	2 (5.88)	32 (94.12)	0.5768- 3.0261	1.6024	0.279
3 rd trimester (7-9 months)	52 (34.67)	3(5.77)	49 (91.40)	0.3862-29691	1.3520	0.213
Total	150	6(4.0)	144(96)			

P = 0.607 (P>0.05) Insignificant

DISCUSSION

Infection with hepatitis B virus is an accepted global problem and it is estimated that there are more than 350 million HBV chronic carriers worldwide (WHO, 2004). Whereas the classification of high endemicity of HBV infection has been defined as HBsAg greater than 7% in adult population (Uneke, *et al.*, 2005). The sero prevalence of 4% (6/150) among pregnant women observed in this study is in tune with the range 2-15% prevalence reported by Mbaawuaga, *et al.*, (2008). It is however slightly less than the range of 4.3% prevalence reported by Akani, *et al.*, (2005) from Port-Harcourt, 5.7% reported by Agbede, *et al.*, (2007) from Ilorin as well as the range 4.9% (450) reported by Ejele and Ojule, (2006) in Delta state, all in Nigeria and also less than 11.6% prevalence rate reported by Harry, *et al.*, 1994) from Maiduguri. It is lower than 4.4% reported by Obi, *et al.* (1993) from Lagos and 4.6% reported by Obi, *et al.*, (2006) from Enugu all in Nigeria. In this study, subjects aged 26-30 years had the highest anti-HBsAg antibody prevalence. This is contrary to the observations of Jatau and Yabaya (2009) and Ahizechukwu, *et al.*, (2011) who reported highest prevalence rates in the ages 21-25 years and 20-24 years respectively. The significance of these ages in terms of time of infection and mode of transmission can not be inferred from the available data and calls for further studies. However, no statistical association between age of subjects and prevalence of HBsAg antibodies exist.

Contrary to the observation of Lilavati, *et al.*, (2004), pregnant women in their 2nd trimester had the highest prevalence rate. This might be due to the backdrop of unidentified risk factors. This finding therefore suggests the need for a longitudinal study that would evaluate some salient cultural and behavioral practices that may facilitate HBsAg transmission in the region. Study subjects in their 2nd trimester had the highest prevalence rate of 5.88% (2/34). This observation is consistent with that of Jatau and Yabaya (2009) about pregnant women in Zaria, Nigeria. Statistical analysis, however showed no significant association (P>0.05) between trimester and prevalence rates of study subjects.

The differences in prevalence rates of anti-HBsAg between developing countries where prevalence rates are higher may be explained by certain factors. This include socio-cultural practices involving the use of contaminated hypodermic instruments for procedures such as scarification, tattooing, circumcision, intravenous drug use and so on which are common practices in many developing countries. Many of these countries also do not have facilities to test for HBV (Lilavati, *et al.*, 2004). However, most developed countries are having low prevalence rates of HBV infection because adequate awareness campaign has been routinely conducted to educate the populace on the risk factors that enhance HBV infection as well as routine screening of blood and blood products for transfusion as this has reduced the prevalence of HBV infection. In most developing countries like Nigeria, most blood transfusion units only test blood donor for Hb percentage and Human immunodeficiency virus (HIV) antibody. In some areas, most people hardly know what hepatitis generally is all about let alone the mode of transmission.

Conclusion

This study provides information on the prevalence of HBV in Calabar, Cross River State, Nigeria and reveals a slightly low prevalence rate as compared with rates reported among pregnant women in some other parts of the country. It has also revealed that age and trimester were apparently not statistically associated with the prevalence rate.

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