

Hepatitis B surface antigenemia (HBsAg) among pregnant women in southern Nigeria

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Abstract

Background: Hepatitis B virus (HBV) infection is one of the most common public health problems worldwide. Over one million people die annually of HBV-related chronic liver disease. Maternal to fetal transmission from chronic carriers exceeds 90% and accounts for up to 40% of the world's chronic carriers in endemic areas.

Methods: This was a descriptive study which involved Serial recruitment of 836 women attending the antenatal clinic at a health facility in Cross-River State, Nigeria from 1st January to 30th June 2010. HBsAg screening was done using an ELISA test.

Results: Fifty five (6.6%) of the 836 women screened tested positive for HBsAg. The mean age and parity of sero-positive subjects was 26.9 ± 5.0 (range 18-38 years) and 2.2 ± 1.2 (0 to 5) respectively. The prevalence was more in women who were farmers (29.1%) and those with either none or low level of formal education (67.2%).

Conclusion: Sero-prevalence of 6.6% among pregnant women is reported. Women education, economic empowerment and public enlightenment programmes focused on modification of risky social lifestyle is recommended. Efforts to promote routine screening of pregnant women, immunization and vaccination of infants should be sustained.

Keywords: Sero-prevalence, Hepatitis B virus, routine screening, immunization.

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Introduction

Hepatitis B virus (HBV) infection is one of the most common public health problems worldwide. It has been estimated that 350 million people world-wide are chronic carriers of hepatitis B virus¹. These chronically infected persons are at a high risk of death from liver cirrhosis and hepatocellular carcinoma^{2,3}. Over one million people die annually of HBV-related chronic liver disease⁴.

In Europe and America, chronic carriers of HBV are found in less than 2% of the population. The sero-prevalence rates of 0.44%, 1.4%, 10% were reported in Netherland, Germany and Hong Kong respectively. Studies done in different regions of Turkey showed that the prevalence rates range from 2% to 14.3%². In Africa, it is believed that more

than half of the population becomes infected during their reproductive lifetime and about 8% of inhabitants become chronic carriers².

Hepatitis B virus is transmitted primarily through parenteral and sexual exposure to HBsAg positive blood or other body fluid⁵. This double stranded DNA virus belonging to hepadnaviridae family is of clinical significance to the Obstetrician. This is due to the fact that viral hepatitis during pregnancy is not only associated with the high risk of maternal complications but also a high rate of vertical transmission causing fetal and neonatal hepatitis⁴.

Perinatal transmission of HBV occurs if the mother has had acute HBV infection during late pregnancy, or if she is a chronic carrier. Neonatal contamination does occur during labour and delivery⁶. Vertical transmission from chronic carriers exceeds 90% and accounts for up to 40% of the world carriers in endemic areas^{6,7,8,9}.

If contaminated, the neonate becomes a chronic carrier himself in 80% to 90% of cases and is prone to cirrhosis and hepatocellular carcinoma in adult life⁶. When the mother is positive for viral DNA in her serum, transmission rate is estimated at 90%⁷. If the mother is negative for viral DNA in the serum, transmission rate is about 10% to 30%⁷.

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Similarly, a positive test for Hb e Ag viral protein which is a marker for patients at high risk for transmission of the disease indicates the individual has a high level of the virus^{8,9}. However, the absence of e-antigen does not necessarily exclude active viral replication because; some patients have mutant viruses that do not give rise to e-antigen. The disappearance of Hbe Ag and rise in anti-Hbe antibodies is associated with a decline in vireamia^{8,10}.

A study done in Canada showed that hepatitis in pregnancy is not associated with increase abortion rate, still birth or congenital malformation⁶. However, prematurity is likely to increase if hepatitis is acquired in the last trimester⁶. Some studies have also demonstrated that infants born to mothers with acute infection during pregnancy have low birth weights².

Hepatitis B virus infection in pregnancy could be detected through the 3-part hepatitis B blood panel. These includes hepatitis B surface Antigen (HBsAg), hepatitis B surface Antibody (HBsAb or anti-Hbs) and hepatitis B core Antibody (HbcAb or anti-HBc)¹². The prevention of HBV infection among pregnant women should be a major concern of every reproductive health expert. Notable agencies such as the United States Preventive Services Task Force (USPSTF), Centres for Disease Control (CDC) and Advisory Committee on Immunization Practices (ACIP) have all strongly recommended universal HBsAg screening of pregnant women to prevent perinatal HBV transmission and Mother-to-child infection of HBV¹³.

Despite these strong recommendations based on good evidence in maternal-fetal medical practice, several health care centers in developing nations of the world, including Nigeria, are yet to make HBV screening in pregnancy a routine practice. Routine screening in pregnancy for some of these infectious pathogens have been restricted to blood donors. This has negatively affected the prevention, diagnosis and early treatment of the infection in pregnancy.

It is true that in resource -constrained countries like Nigeria, adopting and implementing a new preventive measure requires not only the proof of the existence of the infection but also its magnitude and the trend of the problem in the community¹¹. This also includes the implication of not adopting timely intervention measures¹¹. Although, some studies on sero-prevalence of HBV infection in pregnancy have been done in Nigeria,

few have taken place in secondary health care centers in the Southern region of the country.

There is need therefore to assess the current prevalence and the trend in the spread of the infection. This study was thus designed to assess the sero-prevalence of HBsAg in pregnancy in a secondary health care facility in South-South, Nigeria.

Methods

Study setting and design

The study was carried out at the Sacred Heart Hospital (SHH) Obudu, Cross-River State, Nigeria. Obudu is an urban community whose inhabitants are civil servants, students, traders and farmers. The SHH is the largest in the area and offers clinical services ranging from primary to secondary care. The center also provides service to patients from neighboring Local Government Areas (LGAs) to Obudu LGA in Cross-River State. This was a descriptive study carried out from 1st January to 30th June 2010.

Subjects

A total of 836 subjects who attended the antenatal booking clinic and consented were recruited serially into the study by the researcher. They were offered pre and posttest counseling by trained antenatal nurses.

Ethical approval

The hospital gave ethical clearance and approval for the study to be conducted.

Procedure

During the initial antenatal investigation, five milliliters of blood was taken from each subject for HBsAg test by laboratory scientist. The blood samples were code-labelled to ensure confidentiality. After centrifugation, the samples were analyzed at the hospital laboratory for HBsAg. The test was performed using a rapid Enzyme Linked immunosorbent Assay (ELISA) with test kit by Biotec Lab Ltd, Ipswich, Suffolk, IP5 3TP UK; in accordance with the manufacturer's instructions. All reactive samples were further tested with HBV ELISA kit from DIA-PRO Diagnostic Bioprobes Srl via columella, Italy. Those who remained reactive were considered positive for HBV. All subjects, irrespective of their sero-status were offered post - test counselling.

Data analysis

Data collected included the serological status of subjects studied and their socio-demographic characteristics. This was done through the use of a proforma. The variables of sero-positive subjects were analyzed using EPI Info Statistical software Version 3.2.2.

Results

Eight hundred and thirty six (836) subjects were screened for HBsAg, out of which 55(6.6%) tested positive (table 1).

The mean age and parity of sero-positive subjects were 26.9 ± 5.0 years (range 18-38 years) and 2.2 ± 1.2 (0 to 5) respectively. The age group mostly affected was 24 to 28 year old. Thirty two point seven percent (32.7%) had secondary level of education, 12.7% primary, 30.9% tertiary and 23.7% did not have any formal education. Farmers constituted 29.1%, civil servants 23.6%, traders 20.0%, students 14.5%, teachers 5.5% and others 7.3% (table 2).

Table 1: HBsAg serology of subjects studied

Serology	Number	Percentage
Positive	55	6.6
Negative	781	93.4
Total	836	100.0

Table 2: Socio-demographic features of HBsAg positive subjects

Age group	Frequency	Percentage
d"18	1	1.8
19-23	14	25.5
24-28	23	41.8
29-33	10	18.2
34-38	7	12.7
Occupation		
Farming	16	29.1
Civil Servants	13	23.6
Schooling	8	14.5
Trading	11	20.0
Others	4	7.3
Teaching	3	5.5
Education		
None	13	23.6
Primary	7	12.7
Secondary	18	32.7
Post-Secondary	17	30.9
Parity		
0	5	9.1
1-2	27	49.1
3-4	22	40.0

Figure 1 Shows the prevalence of HBsAg among pregnant women in some parts of south -south zone in Nigeria, namely Benin-city (2.2%), Port-Harcourt (4.3%) and Obudu (6.6%). Figure 2 demonstrates regional variations among the three zones out of the six in the country. The south-east represented by Enugu reported 4.3%, south-west represented by Lagos reported 6.08% and south-south represented by Obudu reported 6.6%. This showed a relatively higher prevalence in south-south zone in Nigeria.

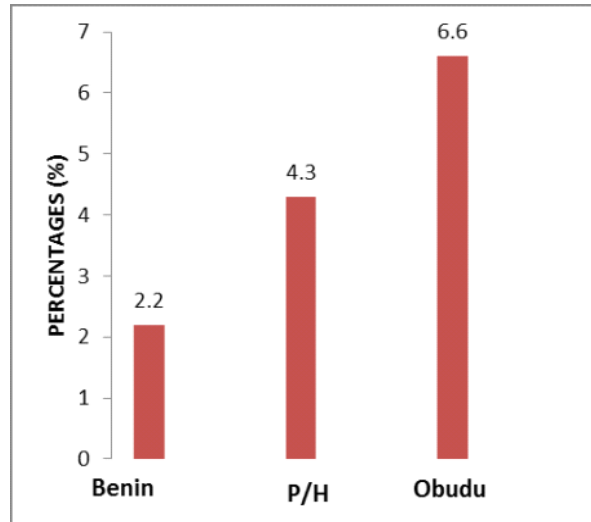
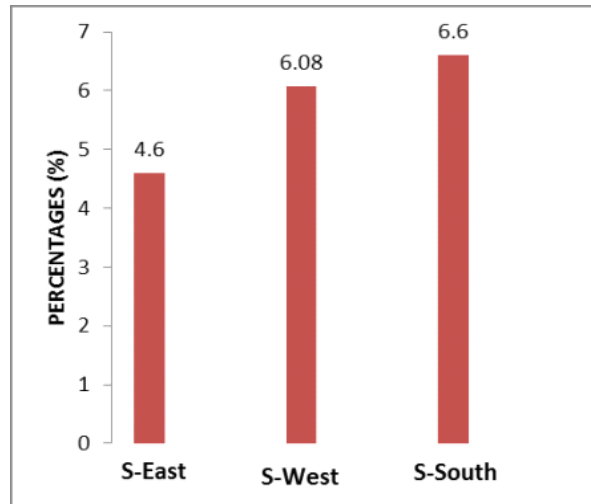


Figure 1: Sero-prevalence of HBV in some urban centers in South-South Nigeria



Key: S-East (Enugu), S-West (Lagos) and S-South (Obudu).

Figure 2: Comparison of sero-prevalence of HBV among three centers in the various zones in Southern part of Nigeria

Discussion

The sero-prevalence rate of HBV Infection in pregnancy in the study was 6.6%. This is higher than the prevalence of 2.2% reported in Benin City¹¹, 4.6% in Enugu¹⁴ and 4.3% in Port-Harcourt¹⁵. The prevalence, though higher, is comparable with the 6.08% reported in Lagos¹⁶, Nigeria.

On the international scene, studies have reported various prevalence rates among pregnant women. In Brazil, a prevalence of 1.64%, France 0.29%, Italy 1.1%, Saudi Arabia 2.44%, Pakistan 4.6%, India 2.3%, and Turkey 2.1%. In the Persian Gulf, rates of 7.1% have been reported in Oman and 1.5% in United Arab Emirate. In Africa, rates of 3% to 4% have been reported in Tunisia, 5.6% in Sudan and an astronomically high rate of 25% in Zimbabwe^{2, 17-20}.

Comparing the rate of 6.6% in this study which was carried out at Obudu, with the 2.2% in Benin (reportedly carried out eight years ago) and 4.3% in Port-Harcourt (reportedly carried out five years ago) there is obviously a rising trend of HBV infection among pregnant women in the south-south zone of Nigeria. The recent prevalence in the South-South zone which is reported in this study is also higher than that of the South-East (represented by Enugu) and South-West (represented by Lagos) zones of the country. This is an indication that there is an urgent need to implement intervention measures by stake holders in the health sector to halt and reverse the unfortunate trend of events.

Another important concern demonstrated in the study is the infection of teenage primigravid women. The acquisition of HBV infection among this group of women may most likely be through heterosexual contacts, given that the age at coitarche has reduced over the years. Rabiou et al. in a study of risk factors for hepatitis B virus infection among pregnant women in Lagos, Nigeria, reported that early age at sexual debut below 19 years was a significant contributor¹⁶. Furthermore, more babies at risk of acquiring the infection are likely to be born through these young women who are just beginning their reproductive career. The finding that infection was more among women who either had none or low level of formal education and were mostly involved in agricultural /commercial activities could suggest risky social behavioral practices as a possible means of contacting the infection.

Several studies have shown that screening of pregnant women for HBV infection on the basis of the presence of risk factors may not be effective

¹⁴. Hence routine screening is advocated based on the recommendation of WHO and CDC¹²⁻¹⁵. Immunization has been found to be the most effective way of controlling HBV²¹. The vaccine has an outstanding record of safety and efficacy, and it is 95% effective in preventing development of the chronic carrier state²¹. It is advisable that infants born to HBsAg-positive mothers should receive hepatitis B vaccine and 0.5ml HBIG within 12 hours of birth. The infected mothers were advised to strictly comply with this recommendation in order to reduce the risk of their babies being infected after birth.

Pregnancy has not been shown to be a contraindication for vaccination for HBV². No apparent risk for adverse effects to the developing fetus has been demonstrated when HBV vaccine was administered to pregnant women even in early pregnancy². Therefore, those pregnant women who are identified to be at risk for HBV infection during pregnancy should be vaccinated². With studies showing that lamivudine therapy for HBV in pregnancy can effectively reduce the risk of intrauterine infection, its use in resource rich -settings may also be helpful in preventing maternal-infant HBV transmission²²⁻²⁶. Studies had not shown that vaccination of women who are already infected could be helpful in preventing vertical transmission. Thus, the women who tested positive to HbsAg were not vaccinated; they were however sent to liver specialist for expert medical care.

Conclusion

With the rising trend in HBV infection among pregnant women in the south-south region of the country, health education of the public that is aimed at the modification of risky social lifestyle, routine screening of pregnant women, and immunization of those at risk and mass vaccination of infants irrespective of maternal HBV status is hereby recommended. In this way, HBV infection, including maternal-fetal transmission may be reduced remarkably.

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