

Seroprevalence of Hepatitis B Surface Antigen among Pregnant Women Attending Antenatal Clinic in Federal Medical Center Keffi, Nigeria

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Abstract: Pregnant women infected with Hepatitis B Virus (HBV) represent a major reservoir of the virus in the community. The aim of this study was to determine Hepatitis B surface Antigen (HBsAg) as a serological marker for the viral infection among pregnant women in Keffi and its environs. An immunochromatographic test kit (Clinotech diagnostics and Pharmaceuticals Canada) designed for the qualitative detection of HBsAg in serum was used to screen for the virus among 180 pregnant women. All positive samples were reconfirmed with HBsAg ELISA kit (Globamed, South Africa (PTY) Cape Town). The overall seroprevalence of HBsAg in the study population was 6.67%. Although, HbsAg was detected at a higher rate among pregnant women aged 40-44 than in any other age group, the difference was not statistically significant ($p \geq 0.05$). Similarly those who were illiterate, unmarried, multiparous have had a surgery, blood transfusion or had facial marks had higher prevalence rates although, statistically insignificant ($p > 0.5$). The HBsAg prevalence in this study was high. Therefore, all pregnant women should be screened routinely and not based on risk factors. Children born to HBsAg mothers should be given the required prophylaxes.

Key words: Pregnant women, seroprevalence, hepatitis B surface antigen, risk factors, facial marks, Nigeria

INTRODUCTION

Hepatitis B Virus (HBV) is the causative agent of Hepatitis B, a major infectious disease of the liver. The virus was initially named Australian antigen (Mbaawuaga *et al.*, 2008). It is highly infectious, globally over 2 billion people have been infected with the virus and >350 million have chronic infection (Soods and Malvankar, 2010). Infection with this virus not only leads to acute illness but chronic illness like liver cirrhosis and hepatocellular carcinoma which accounts for more than a million deaths globally (Uyar *et al.*, 2009; Soods and Malvankar, 2010).

Nigeria is classified among the group of countries endemic for HBV infection with a current infected population of 18 million (Mbaawuaga *et al.*, 2008). Annually, up to 1 million of those infected die due to the consequences of infection like liver cirrhosis and hepatocellular carcinoma (Eke *et al.*, 2011). The prevalence rate differs from place to place.

Studies have reported a prevalence rate of 1.6% in Saudi Arabia (Alrowaily *et al.*, 2008), 5.6% in Khartum (Elsheikh *et al.*, 2007), 2.1% in Northern Turkey (Uyar *et al.*, 2009), 1.5% in Libiya (El-Magrahe *et al.*, 2010) and 3.7% in Ethiopia (Awole and Gebre-Selassie, 2005).

Infections by HBV in pregnancy come with its attendant effect on both mother and child. It has been reported that 10-20% of Hepatitis B surface Antigen (HBsAg) positive pregnant women transmit the virus to their babies.

The prevention of vertical transmission is very important because infection at infancy usually leads to a chronic carrier status. This has been reported in 90% of infants born to HBsAg and Hepatitis E Antigen (HBeAg) positive mothers (El-Magrahe *et al.*, 2010; Eke *et al.*, 2011).

Although, this means of transmission has not been reported to be teratogenic, a higher incidence of low birth weight (Uyar *et al.*, 2009), low intelligence quotient (Oguntola, 2008), liver cirrhosis and hepatocellular carcinoma in young adulthood (El-Magrahe *et al.*, 2010) may result. Because of the high risk of developing chronic HBV among infant born to HBsAg positive mothers, administration of Hepatitis B Immunoglobulin (HBIG) in combination with hepatitis B vaccines as post exposure prophylaxis is very important (El-Magrahe *et al.*, 2010). The objective of this study was to assess the prevalence of HBsAg among pregnant women in the study area as a baseline study for their infectivity status and also for identification of newborns who will require prophylaxis against perinatal infection.

MATERIALS AND METHODS

From April-September 2009, blood samples from 180 consenting pregnant women attending antenatal clinic in the Federal Medical Centre Keffi were collected. The resultant sera were screened for HBsAg with Clinotech Hepatitis B test kit (Clinotech diagnostics and Pharmaceuticals Canada) and reconfirmed by smart check HBsAg immunoassay kit (Globalmed, South Africa (PTY) Ltd, Cape Town). The procedures were as recommended by the manufacturers. Each participant was asked to complete an anonymous questionnaire in order to get some demographic information required for the study.

Ethical clearance: An ethical clearance for this research was obtained from the Federal Medical Center Keffi Ethical committee on research involving human beings.

RESULTS AND DISCUSSION

Of the 180 women screened for HBsAg 6.667% (12/180) were seropositive. The highest rate of infection was among pregnant women aged 40-44 years (12.5%) and least among those aged 30-34 years (3.22%) ($p>0.05$) (Table 1). Marital status, gestational age, parity, education, history of blood transfusion and surgery as risk factors for the viral infection were not found to be statistically associated ($p>0.05$) (Table 2).

This study reported HBsAg prevalence of 6.67% among pregnant women attending antenatal clinic in Federal Medical Center Keffi. A similar rate (6.06%) was reported in Lagos (Rabiu *et al.*, 2010). However, the prevalence reported in this study is higher than rates from similar studies in Nigeria that reported 5.5% in Bayelsa (Buseri *et al.*, 2010), 4.3% in PortHarcourt (Akani *et al.*, 2005), 3.8% in Abuja (Bassey *et al.*, 2009) and 5.0% in Ikeja (Opanaye *et al.*, 2006) but lower than reports of 9.3% in Awka (Ezegbudo *et al.*, 2004) and 12.3% in Minna (Ndams *et al.*, 2008). This is not unusual as studies have shown that variations may exist even among regions of the same country (El-Magrahe *et al.*, 2010). Interestingly, an earlier study of HBsAg prevalence in the general population of the study area was found to be 13.2% (Pennap *et al.*, 2010).

The reported prevalence in this study is a cause for alarm because it is high enough to warrant the initiation of routine antenatal screening for HBV infection. This is because HBV positive pregnant women represent a major reservoir of the virus in a community and this can be passed on to the children either vertically or even horizontally (Alrowaily *et al.*, 2008). It is also important to screen for HBV in pregnant women because they are

Table 1: Prevalence of HBsAg in relation to age of the pregnant women

Age (years)	No. of examined	No. positive	Prevalence (%)
18-24	52	5	9.60
25-29	53	2	3.80
30-34	31	1	3.22
35-39	20	1	5.00
40-44	24	3	12.50
Total	180	12	6.67

Table 2: Prevalence of HBsAg among the pregnant women in relation to some risk factors

Variables	No. examined	No. positive	Prevalence (%)	χ^2	p-value
Marital status					
Unmarried	13	0	0.00	-	-
Married	167	12	7.78	8.105	3.84
Total	184	12	-	-	-
Gestational age					
1st variable	140	10	7.14	-	-
2nd variable	18	1	5.56	-	-
3rd variable	22	1	4.55	-	-
Total	180	12	-	7.200	5.99
Education					
Literate	97	3	3.09	-	-
Illiterate	86	9	10.47	-	-
Total	180	12	-	19.600	3.84
Tribal marks					
Yes	17	3	41.17	-	-
No	163	9	3.10	-	-
Total	180	12	-	2.110	3.84
Parity					
Primiparous	93	3	3.22	-	-
Multiparous	87	9	10.34	-	-
Total	180	12	-	11.200	3.84
Blood transfusion					
Yes	47	3	10.46	-	-
No	133	9	5.26	-	-
Total	180	12	-	5.990	3.84
Surgery					
Yes	25	3	12.00	-	-
No	155	9	5.81	-	-
Total	180	12	6.67	3.600	3.84

considered a sentinel population for which data may be extended to the general sexually active heterosexual population (Buseri *et al.*, 2010). Although, the highest prevalence of infection was detected among pregnant women aged 40-44 years (12.5%) and least among those aged 30-34 years (3.2%), the difference was not statistically significant ($p>0.05$). This could be because all the pregnant women fall within the sexually active age bracket. In contrast, Buseri *et al.* (2010) did not record HBV in pregnant women age 40-44 years. The ratio of unmarried to married women in this study was 1:13 and the prevalence of infection was proportionately higher among the married women (7.7 vs. 0%).

The viral infection was found to be irrespective of gestational age ($p>0.05$) although the prevalence was higher among multiparous (10.34%) than primiparous women (3.22%). This could be the result of horizontal transmission that is known to be common during the first 5 years of life (Alrowaily *et al.*, 2008). In this study area, it is common practice to space children with a gap of 2 years maximum therefore, it is very possible to have a multiparous mother with even 2-3 children aged ≤ 5 years at the time she is pregnant who could have served as a

source of horizontal transmission. Women that had undergone blood transmission had a higher prevalence of infection than those that had not (10.46 vs. 5.26%), likewise those that had undergone surgery (12.0 vs. 5.81%). Similarly, having tribal marks was found to be a risk factor whereby 41.14% of pregnant women with facial marks were seropositive for HBsAg whereas only 3.1% among those without marks were seropositive. All these are procedures that enhance the transmission of blood borne pathogens. However, none of these risk factors was statistically significant ($p>0.05$).

Another important parameter in this study was education as a risk factor. Illiterate women had a higher risk of infection (10.4%) than the literate women (3.0%). This indicates the influence of education on the prevalence. Although, being literate is not synonymous to being hygienic, the literate woman has the advantage of being able to read about the viral infection and methods of preventing it. All the risk factors studied were only arithmetically significant not statistically significant ($p>0.05$). A similar observation was reported from a similar study in Minna (Ndams *et al.*, 2008). Rabi *et al.* (2010) advised that screening pregnant women for HBV on the basis of risk factors may not be effective.

CONCLUSION

This study reported a relatively high prevalence of HBsAg in the study area. Also despite the high prevalence all the risk factors studied were not statistically significant as predisposing factors to HBV infection. Thus screening of all pregnant women should be made part of the antenatal care irrespective of risk factors. Likewise the administration of prophylaxis for babies of HBsAg positive mothers will greatly assist in reducing maternal transmission of HBV.

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