Hepatitis B Virus Sero-Prevalence among Pregnant Females in Northern Nigeria


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Abstract: Hepatitis B Virus (HBV) continues to cause serious health problems in developing countries. Neonatal infection with HBV which is often acquired during delivery, carries a high risk resulting in persistent infection. This research aims to detect the prevalence of Hepatitis B surface Antigen (HBsAg) among pregnant women in the location of study. About 180 sera samples were screened among pregnant women aged 13-49 using Standard ELISA Method. Structured questionnaire were administered to the subjects to obtain demographic and other relevant data. Overall result showed that 31 (17.2%) were found to be positive for HBsAg among the total subjects screened. The highest prevalence was found among those aged 20-29 with 11 (6.1%) seropositivity ($\chi^2 = 7.902, p-value = 0.048$). Considering occupational distribution of volunteer subjects, a high prevalence of 12 (6.7%), p<0.05 was recorded among house wives which shows a measure of significance compared to other women screened. Furthermore, based on various risk factors subjects with history of surgery and use of unsterilized sharp instruments recorded 15 (8.3%) prevalence (p-value 0.233; p>0.05). However, women in their second trimester of pregnancy recorded a higher prevalence of 23 (12.8%; p-value 0.080, p<0.05). This study therefore emphasizes the public health importance of HBV among pregnant women and equally suggests that children born to women with Hepatitis B virus be closely monitored for infection beyond the one and the half years of age this also calls for a proper enlightenment on the dangers posed by the virus while a well designed vaccination schedule is advocated among the general populace.

Key words: Pregnant women, HBsAg, seroprevalence, vaccination, Hepatitis B virus

INTRODUCTION

Hepatitis B Virus (HBV) occurs worldwide and constitutes a serious public health problem. Globally, it is estimated that >2 billion people have been infected with HBV of these, about 350 million develop chronic infection and become carriers of the virus while about 1.5 million deaths occur from HBV related liver diseases including end stage cirrhosis and hepatocellular carcinoma each year (Ferriera, 2000; Cheesbrough, 2000).

Three major routes spread HBV are perinatal, horizontal and sexual transmission (Edmunds et al., 1996). In developing countries, the main routes of transmission are neonatal with HBV carrier mother infecting her infant usually during birth or soon after birth following close contact, transfer of HBV via cuts, sexual transmission, transfusion of infected blood or blood products, needle stick injury, re-use of HBV contaminated needles, syringes, lancets and instruments including those used in tribal ceremonies (Cheesbrough, 2000). Neonates who contract hepatitis will have an almost 90% risk of developing chronic HBsAg carriage and chronic liver disease. Infants may also spread the disease to siblings and to a community (Srirakaskh and Anil, 1997). About 80-90% of chronic infection have been found amongst infected neonate born to HBAg positive carrier mothers (30%) followed by children uninfected before 6 months of age Nigeria is classified among the group of countries endemic for HBV infection. Currently about 18 million Nigerians are infected. Many of these people may not be aware of the infection and hence fail to seek appropriate medical attention.

There is common belief that transmission of Hepatitis B virus from carrier mothers to their babies can occur during the prenatal period. Vertical transmission from infected mother to infant is thought to be partially responsible for high prevalent of infection in certain high risk group (Arevalo, 1989).

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This research work is aimed to ascertain the prevalence of Hepatitis B surface antigen among pregnant women in Bayara-Bauchi Metropolis and to determine the risk reduction for foetus at birth, as this will help the identification of newborns who will require prophylaxis against perinatal infection since, infants born to mothers positive for Hepatitis B virus antibodies have a 70-90% chance of acquiring perinatal HBV infection. Hence, the in-utero transmission of HBV from infected mother to their off spring has been well documented.

It is therefore recommended that high risk pregnant women should be tested for Hepatitis B surface Antigen (HBsAg) early in each pregnancy (Corrario et al., 1999).

MATERIALS AND METHODS

Study area: The study was carried out at the Infectious Disease Hospital, Bayara in Bauchi State, Nigeria.

Study population: Women attending antenatal clinic at Infectious Disease Hospital, Bayara in Bauchi State were recruited for this study.

Questionnaire: A well structured questionnaire was issued to the subjects to obtain demographic and other relevant data.

Sample collection and processing: About 3-5 mL of blood was collected from each diabetic patient aseptically. Blood samples were allowed to clot at room temperature undisturbed, thereafter sera obtained were dispensed into a clean, dry cryovial and stored at -20°C prior use. The sera were screened for HBsAg using ELISA Method.

Ethical clearance: Ethical clearance was sought and obtained from Infectious Disease Hospital, Bayara in Bauchi State.

Data analysis: Filled questionnaires were crosschecked manually for correct data entry. Data were analyzed using the SPSS Software package while the critical level for statistical significance was set at p = 5% using the Chi-square analysis.

RESULTS AND DISCUSSION

Table 1 shows the distribution of HBsAg infection among the one hundred and eighty pregnant women screened, 31 of them tested positive representing 17.2% while 149 of the women representing 82.8% were negative to HBsAg infection (Fig. 1). Table 2 shows the distribution of HBsAg based on age it subjects aged (20-29 years) recorded a higher prevalence of 6.1% (Fig. 2).

Table 3 shows distribution of pregnant women screened based on occupational distribution, housewives recorded the highest prevalence of 6.7% while civil servants recorded a prevalence of 5.0% followed by traders 37 (4.4%) and farmers 37 (1.1%), respectively (Fig. 3).

Table 4 shows the distribution with respect to the risk factors. Risks associated with the use of unsterilized

<p>| Table 1: Distribution of HBsAg within the population screened |
|---------------------------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Location</th>
<th>Positive (%)</th>
<th>Negative (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDH Bayara</td>
<td>31 (17.2)</td>
<td>149 (82.8)</td>
<td>180 (100)</td>
</tr>
</tbody>
</table>

<p>| Table 2: Distribution based on age group |
|---------------------------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Age group</th>
<th>Positive (%)</th>
<th>Negative (%)</th>
<th>Total tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-19</td>
<td>7 (3.9)</td>
<td>25 (13.9)</td>
<td>32</td>
</tr>
<tr>
<td>20-29</td>
<td>11 (6.1)</td>
<td>75 (41.7)</td>
<td>86</td>
</tr>
<tr>
<td>30-39</td>
<td>8 (4.4)</td>
<td>43 (23.9)</td>
<td>51</td>
</tr>
<tr>
<td>40-49</td>
<td>5 (2.8)</td>
<td>6 (3.3)</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>31 (17.2)</td>
<td>149 (82.8)</td>
<td>180</td>
</tr>
</tbody>
</table>

$\chi^2 = 7.902, df = 3, p-value = 0.048$

<p>| Table 3: Distribution of HBsAg based on demographic factors |
|---------------------------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Occupation</th>
<th>No. tested</th>
<th>Positive (%)</th>
<th>Negative (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housewives</td>
<td>106</td>
<td>12 (6.7)</td>
<td>94 (52.2)</td>
<td>0.004</td>
</tr>
<tr>
<td>Traders</td>
<td>23</td>
<td>8 (4.4)</td>
<td>15 (8.3)</td>
<td>0.004</td>
</tr>
<tr>
<td>Civil servants</td>
<td>14</td>
<td>9 (5.0)</td>
<td>5 (2.8)</td>
<td>0.004</td>
</tr>
<tr>
<td>Farmers</td>
<td>37</td>
<td>2 (1.1)</td>
<td>35 (19.4)</td>
<td>0.371</td>
</tr>
<tr>
<td>Total</td>
<td>180</td>
<td>31 (17.2)</td>
<td>149 (82.8)</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Fig. 1: Overall distribution of HBsAg among pregnant women

Fig. 2: Distribution of HBsAg based on age it subjects aged (20-29 years) recorded a higher prevalence of 6.1%
sharps instrument recorded and subjects with history of surgery recorded 15 (8.3%) prevalence while those with history of blood transfusion had 7 (3.9%). Use of hard drugs recorded 4 (2.2%) while those with history of circumcision recorded the least 2 (1.1%) prevalence.

Table 5 shows distribution based on trimester.

In this study, 17.2% prevalence was recorded. The result obtained is significant when compared with a related study in Maiduguri which showed that prevalence increased from 11.6% in 1994 to 15.8% in 1999 (Harry et al., 1994; Baba et al., 1999), further more the result obtained in this study is equally higher than those obtained by Pennap et al. (2011) who recorded a prevalent rate of 6.67% among pregnant women attending antenatal clinic in Federal Medical Center Keffi and those of Ndams et al. (2008) who reported 12.3% prevalence in a study conducted among pregnant women in Minna and that carried out by Onwuliri et al. (2008) where a prevalence of 16.6% was recorded in a study among pregnant women in Vom.

Lower reports included 2.19% in Benin city (Onakewhor et al., 2001) 4.3% in Port Harcourt in 2005 (Akani et al., 2005) and 2.89% in 2006 (Obi et al., 2006) and 5.7% in Ilorin (Agbede et al., 2007). Though within the same continent, the result of this study is higher than the 6.3% reported in pregnant women in Tanzania and 3.7% in Ethiopia (Awole and Gebre-Selassie, 2005).

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 (Onwuliri et al., 2008).

In this study women aged 20-29 recorded 6.1% prevalence compared to other age group with the lowest
prevalence of 2.8% recorded among subjects aged 40-49 this is however, contrary to the report by Pennap et al. (2011) who recorded a high prevalence of 12.5% among pregnant women aged 40-44. The resultant high prevalence among this age group in this study is attributed to the fact that these women fall within the sexually active age bracket according to Poorolajal et al. (1996). Age is an important factor in epidemiology studies hence, the age of acquiring infection was found to be a major determinant of the incidence of HBV.

Most of the women studied were in the 2nd trimester of gestation, this group also had the highest HBsAg seropositivity of 12.8%, the result obtained in this study is lower than those of Ndams et al. (2008) who obtained a prevalence of 13.4% at the 2nd trimester of pregnancy (Fig. 4).

Analysis showed that out of the 106 respondents 58.8% were housewives out of which about 12 (6.7%) tested positive for HBsAg as compared to civil servants who recorded 5.6% positivity. Although, HBV infection is considered one of the most important occupational infectious hazards in developed countries (Abdool-Karim et al., 1989), results from this study did reveal statistical but not clinical significance between HBV seropositivity and the different occupations of the pregnant women studied.

Women with a history of blood transfusions recorded a prevalence of 4.4% while those with history of surgery recorded 8.3% similarly those with history of use of unsterilized/sharp instruments also recorded 8.3% prevalence which was statistically higher than other groups. This implies that the infections in this class of women possibly resulted from possible wounds obtained from exchange or re-use of sharp instruments.

Although, WHO recommended that Hepatitis B vaccine be incorporated into routine infant and childhood immunization program for all countries by 1997, only 130 of 216 countries introduced Hepatitis B immunization into their national infant and childhood immunization programme by the beginning of 2001. The major hurdle to universal Hepatitis B immunization is the cost of Hepatitis B vaccine, especially for developing countries the cost of three doses of Hepatitis B vaccine remains higher than the cost of other vaccines included in routine infant immunization programmes (Kao and Chen, 2002).

CONCLUSION

This study reported a relatively high prevalence of HBsAg in the study area 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.

REFERENCES


