Short Communication

Prevalence of asymptomatic hepatitis B virus surface antigenemia in children in Ilesha, Osun state, South-Western Nigeria

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Hepatitis B virus (HBV) infection is endemic in sub-Saharan Africa with a range of 8 to 20% prevalence of chronic carriers. Most HBV infections occur early in life by perinatal transmission from the mother to her newborn baby, and horizontal transmission from child to child resulting from blood contact. This study was therefore carried out to assess the prevalence of Hepatitis B virus surface antigenemia (HBsAg) in children born in Ilesha, Osun State, Southwestern Nigeria. A total of 144 children at age range 21 days to 13 years were tested for hepatitis B surface antigen (HBsAg) in Ilesha using Bio-Rad Monolisa HBsAg Ultra kit [enzyme-linked immunosorbent assay (ELISA), ELISA method]. Twenty (13.9%) children were seropositive for HBsAg. The age bracket 1-5 years had the highest number of children and the highest number of HBsAg positive cases (15.8%). Female children had a higher HBsAg antigenemia of 15.4% compared to 12.7% for the male children. High prevalence of hepatitis B surface antigen was found among the children. Focus should be re-intensified on childhood vaccination and information dissemination on the risk and mode of transmission of HBV. Women especially, should be educated on HBV to prevent Mother-to-child transmission (MTCT) of the infection.

Key words: Children, enzyme-linked immunosorbent assay (ELISA), Hepatitis B virus (HBV), Hepatitis B virus surface antigenemia (HBsAg), Nigeria.

INTRODUCTION

Currently, about 350 million people worldwide are affected by chronic infection with the hepatitis B virus (HBV), which is the main cause of chronic liver disease (cirrhosis and hepatocellular carcinoma) and liver-related mortality (Rouet et al., 2008). Hepatitis B virus (HBV) infection is endemic in sub-Saharan Africa (Beasley, 1988; Majori et al., 2008) with an 8 to 20% prevalence of chronic carriers (HBsAg positivity), which is estimated

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Table 1. Prevalence of HBsAg among children in relation to age of the subjects.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number tested</th>
<th>Number positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>25</td>
<td>3 (12)</td>
</tr>
<tr>
<td>1-5</td>
<td>95</td>
<td>15 (15.8)</td>
</tr>
<tr>
<td>6-10</td>
<td>17</td>
<td>1 (5.9)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>7</td>
<td>1 (14.3)</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>20 (13.9)</td>
</tr>
</tbody>
</table>

Table 2. Prevalence of HBsAg among children in relation to gender (sex) of the subjects.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number tested</th>
<th>Number positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>79</td>
<td>10 (12.7)</td>
</tr>
<tr>
<td>Female</td>
<td>65</td>
<td>10 (15.4)</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>20 (13.9)</td>
</tr>
</tbody>
</table>

to be approximately 50 million people (Heathcote, 2008).

Most HBV infections occur early in life by perinatal transmission from the mother to her newborn baby (Hollinger and Liang, 2001), or horizontal transmission from playmates or family member resulting from blood contact (Gitlin, 1997). Infected children do not mount an effective immune response and exhibit immune tolerance, so that the risk of chronic infection is high (Beasley, 1988).

HBV is present in the blood, saliva, semen, vaginal secretions, menstrual blood, and, to a lesser extent, perspiration, breast milk, tears, and urine of infected individuals. The virus is resistant to inactivation, can survive outside the body, and is easily transmitted through contact with infected body fluids (Lavanchy, 2004).

Sexual activity, especially heterosexual, and injection-drug use account for the majority of HBV transmission in low-prevalence areas (Seeger and Mason, 2000) while perinatal transmission account for the majority of the transmission in high-prevalence areas (Harry et al., 1994). The global burden of disease attributable to hepatitis B virus remains enormous, and this is due largely to the lack of universal vaccination (Jacob and Kowdley, 2006). This study was therefore carried out to determine the prevalence of asymptomatic HBsAg antigenemia in children in Ilesha, Osun state, Southwestern Nigeria.

MATERIALS AND METHODS

Study population

The study population was made up of 144 apparently healthy children (age bracket 21 days-13 years), attending the welfare clinic of Wesley Guild Hospital, Ilesha, Osun State, Nigeria. The study was carried out from July to October, 2008.

Blood collection and serum separation

Two milliliters (2 ml) of blood sample was collected by venal puncture from each child into sterile vacutainers after informed consents given by the parents/guardians of the children. Sera were collected aseptically after centrifugation at 3000 rpm for 10 min into sterile containers and preserved at -20°C until tested for the presence of HBsAg.

ELISA test

Prior to testing, the sera were allowed to attain room temperature. For the detection of Hepatitis B surface antigen, Bio-Rad Monolisa HBsAg Ultra kit ® was used. The kit has a sensitivity of 100% and a specificity of 99.94%. The test and interpretation of the results were carried out according to the manufacturer's specifications.

Statistical analysis

The statistical analysis used was the Chi square test using SPSS15.

RESULTS

In this study, 20 of the 144 children tested for HBsAg were seropositive, indicating a prevalence of 13.9%. Further analysis of the prevalence of HBsAg in relation to the age range of the children showed that children ages 1 to 5 years had the highest prevalence rate of 15.8% compared to the other age groups (Table 1), but there was no significant statistical association (P = 0.179) between the HBsAg prevalence and the age of the children in this study.

Table 2 shows the prevalence of HBsAg among children in relation to gender (sex) of the subjects. It shows a higher prevalence among the female children (15.4%) than the male children (12.7%) however, HBsAg prevalence was found not to be associated with sex (P = 0.319) in this study.

DISCUSSION

Perinatal infection of infants from infected mothers and horizontal infection early in childhood from exposure to HBsAg-positive family members and playmates are the main routes of HBV transmission in highly endemic areas, such as Southeast Asia, Africa, the Pacific Islands, and the Arctic (Sharma et al., 2005). In this study, the overall prevalence of HBsAg in children was 13.9% (n=144), and agrees with reports from other parts of the country showing high HBsAg prevalence rates among children. Nasidi and co-workers (1986) found HBsAg prevalence of 10.3% in children from Lagos and Bauchi states while Akenami et al. (1997), in Calabar detected HBsAg prevalence of 20 and 26% in healthy and malnourished children, respectively. Bukbuk and co-workers (2005) found HBsAg prevalence of 44.7% among pupils in primary school in rural Borno state. Although, the prevalence rates from this study and that of other studies presented here are not the same but they firmly place Nigerian children among the highly endemic group of Hepatitis B virus infected persons (Sharma et al., 2005).
In addition to these reports showing high endemicity of HBV infection among children in Nigeria, there are other studies on HBsAg prevalence rates in different population groups from different parts of the country. Awosere et al. (1999) detected a range of 2.7 to 13.3% among different population groups. Akani et al. (2005) detected a prevalence of 4.3% in pregnant women in Port Harcourt. The prevalence of HBsAg among blood donors was 8.9% in Northern Nigeria (Tribedi, 1994), 5.4% in Benin City (Umolu et al., 2005), and 14.3% in Jos (Uneke et al., 2005).

Additional data from this study on the prevalence of HBsAg among children shows that the prevalence of HBsAg was highest in children age group 1-5 years (15.8%). The reason can be attributed to the fact that children at early childhood are exposed to multiple avenues through which they can be infected with HBV. The mode of early childhood transmission of Hepatitis B virus (HBV) occurs by vertical transmission from mother to child and horizontal transmission via unapparent blood or body fluid exposures from parents, siblings, or playmates that inoculate HBV into cutaneous scratches, abrasions, or other lesions or onto mucosal surfaces (Francis et al., 1981).

In this study, results show that the HBsAg prevalence was higher among female children (15.4%) than their male counterparts (12.7%) but there was no statistical significance. This agrees with the findings of Harry et al. (1994) in Northern Nigeria who showed a prevalence of 22.0 and 11.6% respectively, for females and males. However, more studies on higher HBV prevalence among females compared to males need to be conducted to definitely prove if there is any statistical significance.

The results of this study have emphasized the need for urgent intervention measures. We recommend the administration of hepatitis B vaccine and hepatitis B immune globulin (HBIG) to all healthy infants born to HBsAg positive women and women with unknown HBsAg status at birth or at most during the first year of life. The importance of familial screening for Hepatitis B surface antigen among siblings of HBsAg positive children is highly recommended. Focus should be re-intensified on information dissemination on the risk and mode of transmission of HBV. Women especially, should be educated on HBV to prevent MTCT of the infection and the disease.

In conclusion, this study has shown the prevalence of HBsAg among children in Ilesha, Osun state and contributes to the information on the burden of Hepatitis B infection among children in Nigeria. This result shows Ilesha as an area of high HBV endemicity corresponding to previous reports on hepatitis B prevalence in sub-Saharan Africa.

**Conflict of Interests**

The author(s) have not declared any conflict of interests.

**REFERENCES**


