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Hepatitis B Surface Antigenaemia in Jos

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Summary

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Enzyme Linked Immunosorbent Assay (ELISA) method was used to detect hepatitis B surface antigen (HBsAg) in 501 children, aged between six months and 12 years, at the Jos University Teaching Hospital. Of the 501 subjects, 19.5 percent were HBsAg positive, out of whom 51.0 percent were males and 49.0 percent females. The prevalence of HBsAg was highest at 26.4 percent, among the age group between three and five years. Thereafter, there was a progressive fall in the prevalence with advancing age. The present findings have confirmed the hyper-endemicity of HBV infection in Jos environment; the findings also confirm that the infection is usually acquired early in childhood . The high prevalence of this infection underlines the need for HBV vaccination early in childhood, preferably in the first year of life.

Introduction

HEPATITIS B virus (HBV) infection is a major global health problem, particularly in Africa, South East Asia and the Mediterranean, where the infection is highly endemic.[1-4] HBV infection is associated with high mortality from chronic liver diseases and hepatocellular carcinoma.[5-7] In areas of high endemicity, infection with HBV is believed to occur early in childhood.[8,9] Children who acquire HBV infection early in life are more likely to become chronic carriers than when infection occurs later in life.[8] These children will grow up to become important sources of horizontal transmission, maintaining a high prevalence rate and perpetuating HBV infection in these areas. The World Health Organisation (WHO) has recommended the integration of the HBV vaccine into the routine Expanded Programme

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on Immunization (EPI) programme in countries where the hepatitis B carrier rate is eight percent or more.[10] There is still however, paucity of information on the prevalence of HBV infection in Nigerian children, particularly from the northern part of the country, including the Middle Belt region. The aim of the present study was therefore, to determine the prevalence of Hepatitis B Surface antigen (HBsAg) among children from the Middle Belt region, using the sensitive ELISA method.

Subjects and Methods

Blood samples were collected from children attending the paediatric general outpatient clinic, Jos University Teaching Hospital (JUTH). The subjects suffered from no liver, gastro-intestinal tract or renal disorders, nor did they have symptoms or signs of acute infection, such as pyrexia. Blood samples were also collected from apparently healthy school children who attended JUTH for routine medical examination as required by their respective schools. All children with sickle-cell disease (SCD), or history suggestive of SCD were excluded from the study. None of the subjects had received hepatitis B immunization in the past. Five milliliters of venous blood were obtained from each subject and centrifuged within four hours and the serum frozen at -20°C. At the time of assay, frozen sera were allowed to thaw at room temperature before being used for the study. HBsAg was detected by the ELISA method, using commercial kits (Wellcozyme HBsAg from Wellcome Diagnostics, Dartford, England), according to the protocol of the manufacturer. Approval of the Ethical Committee, JUTH, was obtained before the study was undertaken . Parents and the older children were fully informed about the study and only those from whom consent was obtained, entered into the study. The Chi square and Student's 't' tests were used where appropriate for statistical evaluation.

Results

Five hundred and one subjects (258 males and 243 females, M:F ratio 1.1:1), aged between six months and 12 years, were studied and of these, 98 (19.6 percent) were HBsAg positive and 50 (51.0 percent) of these 98 subjects were males and 48 (49percent) females. There was no difference ($P<0.5$) between males and females in the prevalence of HBsantigenaemia. The age group distribution of HBsantigenaemia (Table) shows that the prevalence of HBsantigenaemia was highest among children, aged between three and five years and thereafter, there was a progressive fall with increasing age (Figure).

TABLE

Age Group Distribution of Hepatitis B Surface Antigenaemia in 501 Children

Age (Years)	*No of Subjects*	*No of Positive*	*Percent of Total*
0.5-2	126	19	15.1
3-5	125	33	26.4
6-8	125	27	21.6
9-12	125	19	15.2
Total	501	98	19.6

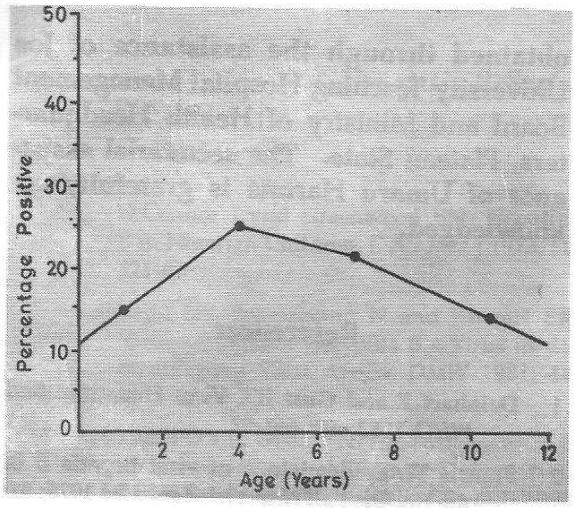

Fig: Age distribution of HBsantigenaemia in subjects.

There was however, no difference in the Hbsantigenaemia of the different age groups (X^2 = 7.1678 df 3, P < 0.10). Four (13.3 percent) out of 30 children, aged below 12 months, were HBsAg positive.

Discussion

The present study has revealed high prevalence of HBsAg among our children; it has also confirmed the hyperendemicity of HBV infection in the country as previousy reported. [4 11] Reports from various parts of the country indicate that the prevalence of HBsAg in childhood ranges from 1.5 to 41.5 percent. [12 13] It has been shown that various factors, including sensitivity of the method used, study population, samples size and difference in the epidemiology of the HBV, [8 12] affect the prevalence of HBsAg. The prevalence of 19.6 percent in the present study was higher than some previous studies, which used less sensitive methods of assay, [12] but it was similar to the 19.5 percent reported from Benin City, [11] using the same ELISA method as in the present study. Using the radioimmune assay (RIA) method, workers in Enugu have reported a prevalence of 41.5 percent, [13] which was almost double the prevalence of 19.5 percent obtained in the present study. The present study has confirmed earlier findings that HBV infection in the country occurred mostly in early childhood. [4 11] Children infected early in childhood are more likely to become chronic carriers than those infected later in life. [8] Previous workers have reported a higher prevalence of HBsantigenaemia among males than females. [1] This sex difference has been explained on the basis of a more rapid decline in HBsAg titre in women, resulting in a shorter duration of the carrier state. In the present study however, there was no sex difference in the prevalence of HBsantigenaemia. The frequency of HBsAtigenaemia rose from 15.0 percent in the age group, six months to two years, reaching a peak of 26.4 percent in the age group, three to five years. Subsequently, there was a progressive fall with advancing age. This pattern of HBsAntigenaemia was similar to that reported from Zaria, [4] where the peak prevalence occurred in the first decade of life and declined progressively thereafter with advancing age. The pattern in our study contrasted with that from Benin City, [14] where an increasing prevalence occurred with advancing age between two months and 15 years. Nasidi *et al*, [15] using the RIA, reported the highest prevalence rate of 23.8 percent among children in the age group, five to six years, but an overall prevalence of 10.9 percent in children under six years of age from Bauchi, which is geographically close to Jos.

Two different patterns of HBV infection

are generally recognized.[17] In populations with a high prevalence of infection, the highest infection and carrier rates occur among children, with steadily declining rates among older age groups, while in populations where HBV infections is relatively uncommon, the peak prevalence of HBsAg is observed in the age group between 20 and 40 years. The findings in the present study have supported the pattern of HBV infection seen in an endemic area. The peak prevalence of HBsantigenaemia observed in the age group, three to five years, would suggest increased childhood contact of infections from older siblings.[9 11 14] The progressive decline with age would suggest that the HBsantigenaemia was probably not life-long and some of the infected children will subsequently lose the antigenaemia.[7]

Confirmed positive HBsAg indicates HBV infection and therefore potential infectivity to others, although monitoring of other markers of HBV infection provides a strong sensitive index of infectivity.[16] The data obtained in the present study have provided further information on the prevalence of HBsAg from different parts of the country; the data have also confirmed the hyperedemicity of HBV infection in Jos. The detection of a high prevalence rate of 13.1 percent among children under the age of 12 months, indicates that HBV infection is common in infancy and this underlines the need for prophylactic vaccination against HBV infection, preferably in the first year of life.

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