

HBs-Antigenemia in Children in Benin City

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SUMMARY

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Using the sensitive Enzyme Linked Immunosorbent Assay method, 161 children aged 1 month to 12 years, were screened for the presence of HBsAg in their sera. Thirty-one (19.3%) of these children were HBsAg positive. Only 1 (3.2%) of the positive cases were under the age of 12 months while only one (2.6%) of 38 children aged 2 years and below were HBsAg positive. This result shows high endemicity of Hepatitis B virus in Nigeria and confirms that infection is early in childhood. The relatively low prevalence of HBsAg in infancy however, tends to suggest that the vertical Hepatitis B infection might not be as important as the horizontal transmission in Nigeria.

Introduction

HEPATITIS B-virus (HBV) infection justifiably continues to receive much attention the world over and particularly in developing countries because of its wide spread distribution, and its association with hepatocellular carcinoma. In areas of high endemicity, like South-east Asia, Central and South Africa, the incidence of hepatocellular carcinoma is therefore, high. In such endemic areas infection in childhood is reportedly the mode of perpetuation of HBV¹⁻⁴.

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Studies of the incidence and mode of infection in children have therefore, attained much importance. While most studies in Nigeria have concentrated on the epidemiology of this infection in adults⁵⁻¹³, there have been very few studies in children.^{11,14-17} Furthermore, most of these studies used the not too sensitive methods of immunodiffusion, counterimmune-electrophoresis and complement fixation. With the development of new and more sensitive methods such as the Enzyme Linked Immunosorbent Assay (ELISA) and Radio-Immuno Assay (RIA), fresh studies of the prevalence of HBs-antigenemia among Nigerian children have become necessary. This study was therefore, carried out to examine the prevalence of HBsAg in Benin City, using the more sensitive ELISA method. This is the first of such study in Bendel State as far as

we are aware and the first in Nigeria using this method. The relative importance of horizontal and perinatal infection is also examined.

Subjects and Methods

One hundred and sixty-one children aged 1 month to 12 years were screened for HBsAg. These were children who attended the University of Benin Teaching Hospital, Benin City for immunisation and from whom blood was taken after informed consent of the parents. Others were children of colleagues and school children from whom blood was taken for some routine examinations such as haemoglobin typing. All those who expressed interest in the results were duly informed after the tests were carried out. Sera obtained from the subjects were frozen at -20°C until the time of assay. Serum - HBsAg was detected using the ELISA-method, making use of commercial kits (Enzygnost HBsAg from Behring-Werke, West-Germany). This method involved the addition of 200 μl of serum samples into wells coated with antibodies from sheep, in microtiter plates and incubating same for 90 minutes at 40°C . Unbound material was washed twice thereafter with a phosphate buffer solution, 200 μl enzyme conjugate (Anti-HBs from

rabbit conjugated with horseradish peroxidase) added to the wells after which the microtiter plate was placed in an oven (40°C) for one hour. Unbound material was again washed twice. Before a final incubation for 30 minutes at room temperature, 200 μl chromogen sulphate containing chromogen orthophenylendiamine dihydrochloride (OPD) was added. The reaction was stopped thereafter with sulphuric acid and the developing colour visually read and compared with the standard provided.

For statistical analysis, the chi-square test was applied where appropriate.

Results

Of the 161 serum samples examined, HBs-antigen was detected in 31 (19.3%; Table I). Of the 23 children under the age of 12 months, 1 (4.3%) was HBsAg Positive as compared to 30 (21.7%) of 138 children above the age of 12 months ($p < 0.05$). Children under one year, therefore, formed only 1 (3.2%) of the 31 HBsAg-positive children. Only 2.6% of children up to the age of 24 months were HBsAg positive as compared to 24.9% above this age ($P < 0.01$). Results of studies in Nigeria (Table II) have shown the incidence of HBs-antigenemia varying from 1.5%¹⁵ to 41.5%¹⁴.

TABLE I
Age Distribution of HBsAg in children in Benin City

Age	No. examined	No. HBsAg-positive	% HBsAg-positive
0-12 months	23	1	4.3
13-24 months	15	0	0
25-47 months	16	3	18.8
4-8 years	50	9	18
9-12 years	57	18	31.5
Total	161	31	19.3

that children up to the age of one year who were HBsAg positive in our study, formed only 3.2% of the total number of HBsAg positive children. Even at age 2 years, only 2.6% of the children were infected. Children infected vertically (in the perinatal period) are known to develop mostly an asymptomatic chronic HBsAg carrier-status. Some recent reports from West Africa have suggested that the horizontal transmission, that is, infection in later childhood, might be more important than the vertical hepatitis B transmission in West African countries.^{19, 22, 23} Further studies in Nigeria, looking at other HBV-markers in children are necessary to confirm the relative importance of each of these two modes of infection. Immunisation with HB-Vaccine alone, would be an adequate prophylactic measure, in areas where the horizontal transmission is the main mode of infection.

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