

PREVALENCE OF HEPATITIS B SURFACE ANTIGEN IN PRIMARY SCHOOL CHILDREN IN NNEWI, NIGERIA

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ABSTRACT

Objective: To study the prevalence of hepatitis B virus infection among primary school children in Nnewi

Subjects/Methods: Two hundred and thirty seven randomly selected school children (127 females, 110 males) in Nnewi Nigeria were assayed for Hepatitis B surface antigen (HbsAg) using ELISA technique.

Results: Eighteen (7.6%) of the children were positive. The seropositivity increased from 2.3% at age range 5-6 years to 10.7% at the age range 11-15 years. The educational background of their parents and guardian as well as previous history of parenteral drug administration did not significantly influence the seropositivity rate ($P>0.05$).

Conclusion: The findings suggest high endemicity and horizontal acquisition of Hepatitis B virus infection as the main mode of transmission.

KEY WORDS: Hepatitis B, Primary school children, Nigeria.

INTRODUCTION

Hepatitis B virus infection is a global health problem. One in six of the world population is infected with the virus and the carrier rate approximates 300 million people¹. Hepatitis B infection is endemic in the developing world occurring more in early childhood.² This early infection will lead to an increased carrier rate with its attendant complications of chronic hepatitis, cirrhosis and hepatocellular carcinoma.³

In endemic areas infection in childhood is reportedly the mode of perpetuation of Hepatitis B virus infection^{4,5}. Hepatitis B virus infection is spread through contact with infected body fluids such as blood, semen, vaginal secretions and saliva. The recognized mode of transmission are prenatal (vertical) sexual, parenteral, percutaneous and horizontal. In endemic areas of Africa child to child transmission (horizontal) is the major mode of HBV spread in childhood.⁶ The increased risk of chronic infection and horizontal transmission serve to sustain a high prevalence of HBV infection and increased incidence of cirrhosis and hepatocellular carcinoma in those areas³. Studies on hepatitis B viral infection in Nigerian children by different assay methods of HbsAg report a prevalence rate of 8.7% - 40%.^{7,12}

This study was designed to ascertain the prevalence rate and factors influencing it in Nnewi, South Eastern Nigeria.

MATERIALS AND METHOD

The study was conducted among primary school children between the ages of 5-12 years in Nnewi, an urban town in

Anambra state. There are 43 primary schools in all the 4 quarters of the town. A school was selected from each of the quarters by balloting. From each of the 4 selected schools pupils were selected from all the classes using the class register which did not show any sex distribution by random sampling. Parental consent and permission of the Anambra State Primary Education Board were obtained for the study.

A pretested questionnaire was distributed to each of the randomly selected children for completion by their parents or guardian. Information on age, sex, previous history of jaundice, educational attainment of parents/guardian blood transfusion, and history of parenteral drug injections were collected through the questionnaire.

Two hundred and thirty seven children within the age range of 5-12 years with no previous history of jaundice or blood transfusion were recruited. 5mls of blood was collected from each child and transported to the assay laboratory. The serum was separated and stored at -20°C until time of assay. All samples were assayed at the same time for HbsAg by ELISA method using commercial kit (Murex, Dartford England). Reactive samples according to manufacturer's criteria were designated HbsAg positive while non-reactive samples were categorized as negative.

The data obtained was statistically analyzed using the computer software SPSS ver 11.5 package.

RESULTS

Two hundred and thirty children- 127 females, 110 males were studied. Their age and sex distribution is as shown in Table 1.

Eighteen children tested positive (7.6%) with a sex distribution of 8 males 10 females ($P>0.05$). The serum

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positivity rate showed an increase from 2.3% at ages 5-6 to 10.7% at age range 11-12yrs. ($P > 0.05$) Table 2.

The educational attainment of 221 parents and guardians who disclosed their educational attainment was analyzed. There was no significant relationship between the parental educational attainment and HBsAg seropositivity of their children. ($P > 0.05$) though HbsAg serum positivity was higher in children of parents/guardians with only primary school education. (Table 3).

Past history of parenteral drug injection did not significantly affect the seropositivity rate irrespective of the sterility of the needles used. If the parent or guardian gave a positive history of witnessing a fresh needle from a packet being used on the child the needle is considered sterile. (Table 4)

DISCUSSION

High endemicity of hepatitis B virus is defined as a HbsAg prevalence of more than 7% in the population¹¹. The observed prevalence of 7.6% confirms the high endemicity of HBV infection in childhood population of Nnewi. This is similar to the findings of Amazigo and Chime in Nsukka¹². Both studies had a similar study population of healthy primary school children and an assay technique of similar sensitivity. The higher prevalence reported from Benin¹⁰, Ibadan⁷, Jos¹³, Zaria¹⁴ with the same sensitive assay methods may be explained by difference in the study populations.

The age prevalence distribution in this study is similar to the findings in Benin¹⁰. The increase in HbsAg seropositivity from 5-6 years range to a maximum at 11-12 years age group indicate increased infection acquisition with increasing age. The higher prevalence in older children who have spent longer school hours will suggest horizontal transmission as an important mode of transmission in children⁶ (child to child transmission). This is in contrast to findings in Asia where vertical transmission is the main mode of transmission.¹⁴

The educational background of the parents and guardians of the subjects did not significantly affect the Hepatitis B surface antigenaemia. This may be because income and living standard do not directly relate to their educational attainment. Where living standards are significantly different between urban and rural subjects, significant difference has been reported^{15,17}.

Parenteral drug injections irrespective of the sterility of the needle used, did not appear to significantly impact on HbsAg antigenaemia acquisition rate among the subjects. although majority of the subject used sterile needles for their parenteral drug administration. The reason for this observation is unclear. However, a similar observation has been reported among Gambian children¹⁸

As modifying the risk factors for HBV infection will be difficult, early immunization with HBV vaccines as advocated by WHO will reduce this high prevalence. Regrettably, hepatitis B vaccination though included in the NPI schedule of Nigeria has not been uniformly observed. We advocate its universal implementation.

Table 1

Age and sex distribution of 237 primary school children studied

Sex	5- 6yrs.	7- 8yrs.	9 - 10yrs.	11- 12yrs.	Total
Male	25	22	42	21	110
Female	19	38	35	35	127
Total	44	60	60	77	237

Table 2

Age distribution of HbsAg Positive Children

Age range In years	No of HbsAg positive	No of HbsAg negative	No children studied	% Positive
5-6	1	41	44	2.3
7-8	3	57	60	5.0
9-10	8	69	77	10.4
11-12	6	50	56	10.7
Total(5-12)	18	219	237	7.6

Table 3

Educational attainment of parents and guardian and HbsAg seropositivity

Educational Attainment	No. of children HbsAg+	No. of children HbsAg-ve	Total	% positive
Primary	9	80	89	10.1
Secondary	3	67	70	4.2
Above	5	57	62	8.0

Table 4

Needles used for parenteral injections and HbsAg seopositivity

Type of needle	Children HbsAg+	Children HbsAg-	Total number of children	%+ BsAg
Fresh from packet (Sterile)	15	157	172	8.7
Unsterile	1	12	13	7.6
Unkown to them	0	40	40	13.04

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