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Survey of Hepatitis A & B Infections in Childhood in Ibadan—A Preliminary Study

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Summary

Johnson AOK, Sodeinde O, Odelola HA and Ayoola EA. Survey of Hepatitis A & B Infections in Children in Ibadan—A Preliminary Study. *Nigerian Journal of Paediatrics* **1986; 13:83.** Venous blood samples from 122 children (84 anicteric and 38 icteric) were analysed for hepatitis B surface antigen (HBs Ag), antibody to hepatitis B core antigen (anti-HBc), antibody to hepatitis A and specific-IgM antibody to hepatitis A. Of the anicteric children, 15% and 31% had HBs Ag and anti-HBc respectively. Fifty-six percent had antibody to hepatitis A and, of these, one child had specific IgM to hepatitis A. In the icteric group, the figures were similar, except that 10% had specific-IgM antibody to hepatitis A virus. Both groups showed an increase in the prevalence of HBs antigenaemia after the age of 2 years. These preliminary data indicate that hepatitis is common and is acquired early in childhood in our environment.

Introduction

IN the more privileged parts of the world, because of the high standard of hygiene, hepatitis virus infections are rare in children except those who have received multiple blood transfusions, those institutionalized and those who have defective immunological responses. [1 2] In the less privileged countries by contrast, infection with the hepatitis virus is quite common and occurs very early in childhood.[3] Yet, very few reports exist of the prevalence of hepatitis A and B in children in these countries, or of the relative proportions of the two types. In the present communication, we report the preliminary findings of an ongoing study designed to provide this information, using very sensitive diagnostic methods.

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Materials and Methods

Venous blood samples were collected from 122 consecutive children, aged 6 months to 14 years, attending for the first time, the Paediatric Gastroenterology Clinic, University College Hospital

(UCH), Ibadan. Thirty-eight of these children were icteric and were diagnosed at presentation as cases of hepatitis, on clinical grounds. The remaining 84 children were anicteric and presented with variable symptoms. Otherwise, the 122 patients were unselected. The sera were separated within 4 hours of venepuncture and stored at -20°C till tested.

All sera were tested for antibody to Hepatitis A virus using the HAVAB radioimmunoassay (RIA) test kit supplied commercially by *Abbott Laboratories, (North Chicago, III, USA)*. Sera which gave a positive reaction were further tested for Hepatitis A specific-IgM antibody using a similar kit (HAVAB-M, *Abbott Laboratories, North Chicago, III, USA*), except that polystyrene plates were used in place of beads. All sera were also tested for Hepatitis B surface antigen (HBs Ag) by reversed passive haemagglutination (RPHA) test and counter immunoelectrophoresis (CIE).

Owing to a limited supply of the reagents, only 84 sera were tested for antibody to Hepatitis B core antigen (Anti-HBc), using CIE and an RIA test kit (CORAB, *Abbott Laboratories*). These 84 sera were selected as follows: the sera were retrieved and arranged into a group of sera from male patients and another group from female patients; 42 were then randomly chosen from each group.

Results

Anicteric children

As shown in Table I, 47 (56%) of the 84 anicteric children had antibody to Hepatitis A virus (HAV). Of these, only one patient had specific-IgM to HAV, indicating an acute infection with this virus. In other words, Hepatitis A virus markers were present in a little more than half of the anicteric children.

By contrast, markers for the Hepatitis B virus were found in slightly less than a third of the same group of anicteric children. Fifteen percent of them had HBs Ag while 31% had antibody to Hepatitis B core antigen.

Icteric children

Among the 38 icteric children, 20 (53%) had HAV antibody, but 4 (11%) had acute Hepatitis A infection (Table II), indicating a higher incidence of acute HAV infection among icteric than anicteric children.

TABLE I

Hepatitis A and B markers in Anicteric Children

Marker	*No Tested*	*No Positive*	*% Positive*
Anti-HAV	84	47	56
IgM - HAV	84	1	1
HBs Ag	84	13	15
Anti - HBc	55	20	31

TABLE II

Hepatitis A and B markers in Icteric Children

Marker	*No Tested*	*No Positive*	*% Positive*
Anti - HAV	38	20	53
IgM - HAV	38	4	11
HBs Ag	38	6	16
Anti - HBc	19*	4	21

* Of the 84 sera randomly selected and tested for Anti-HBc, 19 turned out to have been obtained from icteric children.

For Hepatitis B virus markers, the results were similar to those obtained in anicteric children: six (16%) of the 38 icteric children studied had HBs Ag, while 4 (21%) of the 19 so tested had anti-HBc detected.

Frequencies of HBsAg by age groups

When distribution of HBs antigenaemia was related to age, 16% of the anicteric children less than 2 years old and 22% of those aged 2 - 14 years, had HBsAg. (Table III). In the icteric

TABLE III

Distribution of HBs Antigenaemia in 122 Children

Age Group (yrs)	Anicteric			Icteric		
	No Tested	No Positive	% Positive	No Tested	No Positive	% Positive
<2	38	6	16	27	3	11
2 - 14	46	10	22	11	3	27

group, the corresponding figures were 11% and 27% respectively. This represents a two-and-a-half fold increase in antigenaemia after the age of 2 years in the icteric children; the numbers were however, too few for meaningful statistical analysis.

Discussion

The results of this preliminary study support the impression that many children in developing countries are infected by hepatitis virus at an early age[3,4] and that a significant proportion of apparently healthy individuals are chronic carriers of hepatitis B surface antigen[5–7]. None of the previous studies in Ibadan has been specifically on children and none had used methods as specific and sensitive as were used in the present study. These facts probably explain the much greater incidence of hepatitis both in children below 2 years of age and in those aged 2-14 years in the present study as compared to the earlier report from the same centre[3]. In Zaria, a higher incidence was also found when more sensitive methods were used[8]. It is particularly noteworthy that among the anicteric children studied, more than half had antibody in their sera to hepatitis A, about one-sixth had hepatitis B surface antigenaemia while as many as one-third had markers suggestive of on-going infection with hepatitis B virus. These findings are not markedly different from those in the jaundiced children except that many more of the latter had evidence of active infection with hepatitis A virus.

This preliminary study suggests that HB virus infection in childhood is as common as infection with the HA virus. Whereas HAV infection does not progress to chronicity, it is well established that infection with the B virus may become chronic. Chronic HBV infection in the tropics has been associated with serious outcome. For example, more that half of patients with primary liver cell cancer in Ibadan have hepatitis B surface antigenaemia, and hepatitis B virus infection is now believed to play a significant role in the pathogenesis of this tumour[9–11]. As this is one of the commonest malignant diseases in young adults in Nigeria and some other developing countries, the need to develop preventive measures against hepatitis infection in general but particularly against infection with the HBV, becomes obvious.

While general improvement in hygiene may reduce the prevalence of hepatitis, active immunisation using the recently available vaccine, may produce more dramatic results. The present study suggests that the target group for such vaccination would have to be very young children aged less than 2 years. Recently, a vaccination trial in Senegal showed that the vaccine used protected 85% of susceptible children[12]. A similar study in Nigeria using lower doses of vaccine protected 81% of the vaccinated group[13].

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