

PREVALENCE OF ANTIBODY TO HEPATITIS B VIRUS IN AN URBAN POPULATION OF NORTHEAST BRAZIL

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S U M M A R Y

A sample of 1,288 inhabitants of Salvador, Bahia, Brazil, were submitted to the determination of anti-HBs using radioimmunoassay procedure, and analysed according to age, sex and income. Overall prevalence of anti-HBs was 11,8%, ranging from 6,7% among children aged less than three years old to 26,1% among those aged 30 years and older. Males presented prevalence of anti-HBs similar to female individuals, and those with a higher income showed frequencies of anti-HBs greater than those with a lower income level. The following conclusions were drawn: The high prevalence of anti-HBs observed among children suggests early contact with hepatitis B virus, possibly due to vertical transmission and intrafamiliar dissemination of the disease; the frequency of anti-HBs increases with age; the lower prevalence of anti-HBs among those with low income suggests that this group may present higher prevalence of carriers of the hepatitis B virus surface antigen.

KEY WORDS: Virus hepatitis B — Epidemiology — Antibodies — Northeast Brazil

I N T R O D U C T I O N

The infection to hepatitis B virus presents a worldwide distribution, although it is more prevalent in less developed countries of tropical and subtropical areas^{1,3,4,11,14,20} than in more developed countries^{12,19}. Its relationship to the general socio-economic status of the population is better shown through the distribution of prevalence rates of hepatitis B virus markers according to the social classes within a country^{15,17,18}.

The presence of antibody to the hepatitis B virus surface antigen (anti-HBs) is indicative

of past infection and represents acquired immunity. Therefore, the epidemiologic value of determining the prevalence of anti-HBs is related to the understanding of transmission dynamics and the estimation of the susceptible population, aimed at planning controls programs.

Population-based studies describing the epidemiologic characteristics of the prevalence and distribution of anti-HBs in Brazil are lacking. This report describes the age and sex distribution of the prevalence of anti-HBs, accord-

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ing to the socio-economic status of a defined population in Northeast Brazil.

MATERIALS AND METHODS

The study was carried out during 1981 and 1982 among residents of the city of Salvador, state of Bahia, an urban area of little over 1,500,000 inhabitants. The study group comprised a sample of 1,345 individuals. Participants were selected randomly among children attending public and private schools and among adults seen at private and public physicians' offices and clinical laboratories throughout the city.

Blood samples were collected by venipuncture, and the sera obtained after centrifugation were stored at -20°C freezer temperature. Determination of the presence of anti-HBs was performed by the radioimmunoassay method, using standard procedure recommended for AUSAB reagents (ABBOTT Laboratories).

Each serum sample was tested for transaminases before the determination of anti-HBs and those individuals with elevated levels of transaminases (> 50 units, Reitman and Frankel method) were excluded from the study. This procedure was adopted in order to avoid the participation of individuals with potential liver disease, excluding from analysis some 57 sera samples. Further criteria for exclusion were the presence of jaundice or a diagnosis

of liver disease at the moment of the clinical examination.

Information were collected from each participant on age, sex, educational level, occupation and income. On the basis of the total family income level, participants were divided into two groups: group I comprising those members of families with less than five persons and total family income equal to or more than US\$ 170 per month, and group II formed by those individuals with a total family income of less than US 170 per month.

RESULTS

The total of 1,288 individuals included in the study presented an overall prevalence of anti-HBs of 11.8%. The proportion of those positive to anti-HBs increased from 6.7% for individuals aged less than three years, to a level of 26.1% for those aged more than 30 years (Table 1). The overall prevalence rate of anti-HBs was similar for males and females, respectively, 11.76% and 11.84%. The age and sex distribution of positivity to anti-HBs showed that females aged less than three years and 11 to 14 years old presented a rate higher than males of the same age groups, in contrast to a rate higher in males than in females for those aged seven to ten years, although these differences were not statistically significant.

T A B L E I
Age and sex distribution of prevalence rates of antibody to hepatitis B surface antigen

Age (years)	Males		Females		Total	
	Number examined	% positive	Number examined	% positive	Number examined	% positive
0 -- 3	102	4.9	76	9.2	178	6.7
4 -- 6	110	9.1	80	7.5	190	8.4
7 -- 10	81	8.6	75	4.0	156	10.2
11 -- 14	125	8.0	52	15.4	177	10.2
15 -- 19	110	12.7	97	12.4	207	12.6
20 -- 30	87	12.6	132	12.9	219	12.8
> 30	82	30.5	79	21.5	161	26.1
Total	697	11.8	591	11.8	1288	11.8

Individuals classified as part of group I, representing in this study a better socio-economic status, had an overall prevalence rate of anti-HBs of 13.9%, in contrast to a rate of 9.4% observed for individuals in the group

II (Table 2), a difference that was statistically significant ($X^2 = 5.939$, $df = 1$, $p < 0.05$). The prevalence rates of anti-HBs by sex were similar for males and females within each income level group.

T A B L E II
Age distribution of prevalence rates of antibody to hepatitis B surface antigen by income level

Age (years)	Income level			
	Group I		Group II	
	Number examined	% positive	Number examined	% positive
0 — 3	81	7.4	97	6.2
4 — 6	91	12.1	99	5.1
7 — 10	81	8.6	75	4.0
11 — 14	95	13.7	82	6.1
15 — 19	114	14.0	93	10.8
20 — 30	137	12.4	82	13.4
> 30	91	28.6	70	22.9
Total	690	13.9*	598	9.4*

* $\chi^2 = 5.939$; $P < 0.05$

Group I = high income level, Group II = low income level.

DISCUSSION

The overall prevalence rate of anti-HBs of 11.8% observed in Salvador is relatively low, however, this represents the frequency of anti-HBs for a group of individuals of all ages. In fact, a study performed among blood donors in Brazil⁶ observed prevalence of 26.7%, a rate that is similar to that found in our study for individuals aged more than 30 years.

The gradual rise in the rate of positivity to anti-HBs by age is similar to that described in other populations^{2,14}. Moreover, the relatively high rates found among children in Salvador are comparable to those observed in areas where hepatitis B virus is highly endemic⁷. This may reflect exposition to the virus in the first years of life, possibly due to vertical transmission^{13,16} and intrafamilial dissemination of the infection. In fact, the risk of acquiring the infection during the perinatal period may be as high as 40% to 50% in areas where hepatitis B virus carriers are frequent^{9,10,16}. This study showed that male and female individuals presented similar overall prevalence rates of anti-HBs. Serologic surveys carried out in different countries revealed that males presented a higher prevalence of hepatitis B surface antigen carrier state than females^{14,18}. However, other investigators have found a higher prevalence of anti-HBs among females than males¹⁵.

It was observed a lower rate of anti-HBs among those of a lower socio-economic level.

It is possible that the prevalence of hepatitis B virus carriers is higher in this group, decreasing the number of those presenting anti-HBs. In fact, this group are exposed to a higher risk of acquiring hepatitis B virus earlier in life, with a consequently higher risk of developing the carrier state⁷. In addition, carriers of hepatitis B virus are more prone to develop liver disease including primary liver cancer or to develop antibody to hepatitis B only later in life^{5,8}. Other studies are indicated to increase the knowledge on the epidemiology of the disease in Brazil.

RESUMO

Prevalência de anticorpos contra o vírus da hepatite B em população urbana do nordeste brasileiro.

Um grupo de 1.288 indivíduos, residentes em Salvador, Bahia, Brasil, foi examinado para a determinação de anti-HBs, utilizando-se a técnica do radioimunoensaio. Os resultados foram analisados de acordo com a idade, o sexo e o nível de renda. Uma prevalência de anti-HBs de 11,8% foi observada, variando de 6,7% nas crianças com idade inferior a três anos, a 26,1% para aqueles com idade superior a 30 anos. A prevalência de anti-HBs foi similar em indivíduos do sexo masculino e feminino. Aqueles com nível de renda mais alto tiveram prevalência de anti-HBs maior que o grupo de renda baixa. Dos resultados concluiu-se: a alta prevalência de anti-HBs em crianças sugere o contato precoce com o vírus da hepatite B, possivelmente relacionado com a transmissão vertical e a disseminação intrafamiliar do vírus; a frequência de anti-HBs aumentou com a idade; a baixa prevalência de anti-HBs entre aqueles com baixo nível sócio-econômico sugere que neste grupo pode ser alta a prevalência de portadores do vírus B da hepatite.

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