

Age-prevalence of HBsAg positivity in children seen at Hacettepe Children's Hospital

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Five hundred children seen at Hacettepe Children's Hospital from different age groups were screened to make a suggestion to the age prevalence for HBV infection. HBsAg positivity was 5.4% and anti-HBs positivity was 4.6% among these 500 children, but HBsAg positivity was more prevalent in children under 5 years of age which suggested early exposure of young children in our country. [Turk J Med Res 1992; 10(5):264-266]

Key Words: HBsAg, Anti-HBs, Hepatitis B infection

Hepatitis B is usually transmitted by sexual contact and needle sharing in adolescents or young adults in developing countries. In contrast, hepatitis B is a problem of infancy and early childhood period in developing countries and it is either transmitted perinatally (vertically) or by close personal contact (horizontally) (1)-

HBsAg positivity ranges between 3 to 15% in our country (2-11), but the studies about the age specific prevalence of HBsAg are very few. In this study, we screened the children seen at Hacettepe Children's Hospital and aimed to make an approach to the age of infection of hepatitis B.

MATERIALS AND METHODS

In this study 500 children seen at Hacettepe Children's Hospital out-patient clinics between September-December 1991 were included and matched according the following age groups: 1-2 years, 3-4 years, 5-6 years, 7-9 years and over 10 years of age. Children requiring multiple blood or blood products transfusions such as hemophilia, thalassemia, chronic renal failure, cancer with primary or secondary immune deficiencies, chronic liver disease and acute viral hepatitis B were excluded. They were classified according to their residency, number of siblings, mental status, history of blood transfusion, injection and jaundice (Table 1). HBsAg positive children were further investigated for anti-HBs

IgG, HBeAg, anti-HBe by using Organon kits as of HBsAg and anti-HBs determinations, and serum ALT, AST, total proteins, albumin, direct and indirect bilirubin by routine methods used in this hospital. Mann-Whitney U test chi-square, and Fisher exact chi-square tests used for statistical evaluations.

RESULTS

Twenty-seven out of 500 children were found to be HBsAg positive and the difference between the characteristics of HBsAg positive and negative children was not found significant for none of them (Table 2).

Although HBsAg positivity in children between 1-2 years of age (11%) was higher than the other age groups, the difference between the prevalence of the age groups was not significant (P=0.055), as in the anti-HBs positivity which is more frequent children over

Table 1.. The characteristics of 500 children

Mean age	6 1/12
Age distribution	1-16 years
Sex	
(female/male)	263/237 (52.6%/47.4%)
HBsAg positivity	27/500 (5.4%)
Anti-HBs positivity	23/500 (4.6%)
Previous history of	
Blood transfusion (>1)	14/500 (2.8%)
Injection	487/500 (97.4%)
Acute hepatitis	18/500 (3.6%)
Mean number of siblings	1.45±0.06
Mental retardation	26/500 (3.6%)
Residency	
city	472/500 (94.4%)
province	28/500 (5.6%)

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Table 2. Data of HBsAg and anti-HBs positive and negative children

	HBsAg (+) n=27	HBsAg (-) n=473	P	Anti-HBs (+) n=23	Anti-HBs (-) n=	P
Age	5 ¹ / ₁₂ ±6 ¹ / ₁₂	6 ⁵ / ₁₂ ±3 ¹ / ₁₂	>0.05	9±4 ⁵ / ₁₂	6 ² / ₁₂ ±3 ¹ / ₁₂	<0.01
Sex (female/male)	14/13	223/250	>0.05	12/11	252/225	>0.05
Previous history of						
blood transfusion (>1)	1 (3.7%)	13(2.7%)	>0.05	2 (8.7%)	16(3.4%)	>0.05
injection	27 (100%)	460 (97.5%)	>0.05	23 (100%)	464 (97.3%)	>0.05
acute hepatitis	0	18(3.9%)	>0.05	2 (8.7%)	16(3.4%)	>0.05
Number of siblings	1.41 ±0.26	1.45±0.06	>0.05	1.74*0.40	1.43±0.08	<0.01
Mental retardation	1 (3.7%)	25 (5.3%)	>0.05	2 (8.7%)	12(2.5%)	>0.05
Residency						
city	1 (3.7%)	27 (5.7%)	>0.05	3(13.8%)	25 (5.2%)	>0.05
provinces	26 (96.3%)	446 (94.3)	>0.05	20 (87%)	452 (94.8%)	>0.05

10 years of age (P=0.108) (Table 3), except the mean age and the number of the siblings (P<0.01) (Table 2). The difference of total seropositivity according to the age groups was not found significant either (P=0.298) (Table 3).

The difference of HBsAg positivity between children under 5 years and over 5 years was significant (P=0.021), but was not significant for anti-HBs positivity (P=0.106) (Table 4).

Only seven of 27 HBsAg (+) children returned further investigation. Their physical examinations and liver function tests were found normal. Six of them were HBeAg and anti-HBe negative and IgG type anti-HBc positive. Only one child had IgM anti-HBc and HBeAg who was started levamisole (2.5 mg/kg/day) but could not be follow-up.

DISCUSSION

Acute hepatitis B is usually asymptomatic in children and tends to develop into the chronic carrier state frequently (12).

Table 3. Age prevalence of HBV serology in 500 children*

	HBsAg	Anti-HBs	Total
1-2 years	11%	2%	13%
3-4 years	6%	3%	9%
5-6 years	2%	3%	5%
7-9 years	4%	6%	10%
10-16 years	4%	9%	13%

*For each group n=100

Table 4. HBsAg and anti-HBs positivity for children under and over 5 years

	<5 years (n=200)	>5 (n=300)	P
HBsAg (+)	17(8.5%)	10(3.3%)	0.021
anti-HBs (+)	5 (2.5%)	18(6%)	0.106

Perinatal infection predominates in Asia. If HBsAg (+) mothers are also have HBeAg the risk of perinatal infection is 70-90% and 90% of those children became chronic HBV carriers. Whereas if the mother is HBeAg negative, the perinatal infection and the carrier risk are around 10-40% and 40-70% respectively (13).

The horizontal transmission is important in Africa and it is more prevalent in children of 6 months-6 years of age. Although the exact mechanism of horizontal transmission is not clear, the transfer of the stable HBV by close personal contact has been suggested (14-16).

In this study, the prevalence of HBsAg positivity was high (11 %) in children between 1-2 years and declined with age. The difference of HBsAg positivity between children under 5 years and over 5 years was significant.

In children living at Ataturk Children's Institution in Ankara HBsAg and anti-HBs positivity*was 12.9% and 14.4% under 6 years, 11.1% and 50.4% over 6 years respectively (8). Increase of anti-HBs with age was indicated as in our study, but the high antibody positivity is probably seen in children living in institutions. In one study, none of the babies of asymptomatic HBV carrier mothers developed HBsAg positivity (17). These results suggest that the acute hepatitis B is an infection of young children and the horizontal transmission should be important in our country.

Male predominancy in HBsAg positivity of adults, was not noticed in our study and mental retardation not seem to be a risk factor for HBV carrier state.

The history of acute icteric hepatitis was not obtained in HBsAg positive children and positive history of jaundice in sero negative child could be explained by high prevalence of HAV infection in this age group. Although number of siblings was not discriminatory factor in HBsAg positive children, it was found statistically significant in antibody positive group.

The predominancy of vertical to horizontal transmission of HBsAg in some countries is not well understood. But, genetic susceptibility and the high per-

centage of HBV DNA in HBsAg positivity in Asian mothers might be important (18-20). Therefore, correlation between horizontal transmission and poor socioeconomic conditions requires better evaluation. Back at al investigated HBV markers in Turkish children born in Sweden and born in Turkey and immigrated to Sweden. The children born in Sweden were seronegative whereas those born in their home country had 6% of HBsAg and 32% of anti-HBs positivity (21). In Southern Italy and Japan the horizontal transmission decreased with improving socioeconomic conditions (22-24).

We concluded that acute hepatitis B is probably an infection of 1-5 years in our country and the antibody prevalence increases with age. Although it could be prevented by immunisation, the integration to Extended Programme on Immunisation (EPI) is still controversial because of financial problems (25). The different modes of transmission should be considered for every country before making a decision for EPI.

Hastaneye başvuran çocuklarda HBsAg pozitifliğinin yaş dağılımı

B hepatit infeksiyonunun yaşlara göre sıklığını araştırmak amacıyla Hacettepe Çocuk Hastanesinde görülen ve hepatit B infeksiyon riski olmayan 500 çocukta HBsAg ve anti-HBs Eliza metodu ile taranmıştır. HBsAg pozitifliğinin bir yaşındaki çocuklarda %11, anti-HBs'nin ise %2 bulunmasına karşın, 7 yaşından büyük çocuklarda HBsAg (+)'liğinin %4, anti-HBs'nin ise %6-9 olması çocukların bu enfeksiyona erken yaşlarda maruz kaldığını düşündürmüştür.

[Türk Tıp Araştırma 1992; 10(5):264-266]

Anahtar Kelimeler HBsAg, Anti-HBs, Hepatit B infeksiyonu

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