

SEROPREVALENCE OF ANTIBODIES TO HEPATITIS A AND E VIRUSES IN PEDIATRIC AGE GROUPS IN TURKEY

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Hepatitis A and hepatitis E are enteric transmitted viral diseases occurring in epidemic and sporadic forms especially in developing countries. Previous studies in Turkey showed that most residents are infected with HAV by the second decade of life. Since HEV is generally transmitted by the same route as HAV we conducted a community-based seroprevalence study for HAV and HEV infection in Ahatli area in Antalya, Turkey where socioeconomic conditions are low. Anti-HAV total immunoglobulin was tested by using a microparticle EIA (AxSYM-Abbott Lab). Anti-HEV IgG was assayed by a micro ELISA method (Genelabs-Singapore). Of the 338 sera tested, 112 (33.1%) were positive for anti-HAV total antibody. Anti-HEV Ig G was detected in three (0.89%) of the serum samples. Seropositivity rates of HAV in preschool and school children were 19.9% and 43.9% respectively ($p < 0.001$). No antibody to HEV was detected in preschool children, while the prevalence of anti-HEV Ig G was 1.6% in children attending school. Our data showed that seroprevalence of anti-HAV is high among children samples but HEV infection appears to be relatively rare in pediatric age groups.

Keywords: anti-HAV total immunoglobulin, anti-HEV IgG, pediatric age groups

Introduction

Hepatitis A virus (HAV) and hepatitis E virus (HEV) are the two major causes of enteric transmitted viral hepatitis that occur as endemic and epidemic forms mainly in developing countries [1, 2]. Although they both primarily spread through

contaminated food and water, seroprevalence studies showed that the epidemiology of the hepatitis they cause is quite different [2, 3, 4, 5]. The age specific incidence of HEV infection peaks among young adults rather than young children [6, 7]. Secondary attack rates have been reported low in household contacts with cases of hepatitis E, while the rates of household transmission for hepatitis A proved to be high [8]. Previous studies in Turkey showed that most of the residents are infected with HAV by the second decade of life. In contrast, HEV is found to be more prevalent in adults by the beginning of the third decade of life [9, 10].

HEV infection in pregnant women occurs with high mortality rates [11, 12]. Also, vertical transmission has been reported [13].

Here we report a community-based seroprevalence study for HAV and HEV infections in children in Ahatli, which is a squatter area in Antalya, Turkey.

Materials and methods

Serum samples were obtained between July 1996 and May 1997 from 151 preschool children (1–5 years old) and from 187 school children (6–11 years old) randomly selected in Ahatli, Antalya, Turkey. The population of area region is nearly 25 thousands and the population of Antalya city is 1,262,909 according to the 1996 census. All serum samples were stored at -20°C until tested. Anti-HAV total antibody was detected by microparticle enzyme immunoassay (AxSYM-Abbott Lab., Germany). Anti-HEV Ig G was determined by micro ELISA method based on two recombinant HEV antigens (Genelabs, Singapore).

The Chi-Square and McNemar tests were used for statistical analysis.

Results

Of the 338 sera tested, 112 (33.1%) were positive for anti-HAV total antibody. Anti-HEV Ig G was detected in three (0.89%) of the serum samples. The difference was statistically significant ($p < 0.001$). Age specific prevalence of anti-HAV total antibody and anti-HEV IgG is shown in Table I. Seropositivity rates of HAV in preschool and school children were 19.9% and 43.9%, respectively ($p < 0.001$). No antibody to HEV was detected in preschool children, while the prevalence of anti-HEV IgG was 1.6% in children attending school.

Table I*Age specific seroprevalence of anti-HAV total antibody and anti-HEV IgG*

Age groups	n	Anti-HAV total antibody		Anti-HEV Ig G	
		+	(%)	+	(%)
Preschool children (1–5 years old)	151	30	(19.9)*	0	(0.00)
School children (6–11 years old)	187	82	(43.9)*	3	(1.60)
Total	338	112	(33.1)**	3	(0.89)**

* p<0.001 Chi-Square

**p<0.001 Mc Nemar

Discussion

The reasons for the distinct seroepidemiologic features of HAV and HEV in areas where the two enteric hepatitis viruses are endemic are not completely understood. Our study showed an obvious difference between HAV and HEV seropositivity rates in pediatric age groups.

Similar low seroprevalence rates for HEV were reported in previous population-based studies where the degree of HAV exposure was found to be considerably high in pediatric ages [4, 5]. Thomas et al. detected anti-HEV in 2.3% of Turkish residents younger than 26 years old, while seroprevalance was 6.2–8.5% in older age groups [9]. He pointed out that the independent predictors for HEV infection were older age, lower level of education, HCV infection and living in warmer southern regions. No outbreak of HEV infection has been reported in Turkey so far. Arrankalle et al. speculated that this age specific antibody profile might be due to the increased exposure to HEV in young adults through sexual contact, exposure to high risk environments through work and travel or increased exposure by consuming high volumes of contaminated food and water, rather than insufficient immunity in children [3].

It has been described that HEV occurs in two forms [14, 15]. Epidemic hepatitis E is relatively uncommon, while the majority of the cases occur as endemic disease [15]. HEV infection seems to be less common in children than in adults in countries

where the disease is endemic, but children are still susceptible to infection with prolonged viremia and HEV can be a frequent cause of epidemic and sporadic hepatitis in pediatric population [16, 17, 18, 19]. Co-infection with HAV and HEV is a possibility with serious complications such as acute liver failure [17, 18].

The low level of fecal secretion and less infectiousness of HEV virus may also contribute to the relatively low level of transmission among children, which also explains rare intrafamilial or person-to-person transmission [2, 8]. However, there are some reports that anti-HEV IgG antibodies are short lived [1, 20]. Recently antibody to HEV was identified in pigs, sheep, cattle and rodents and also isolation of HEV from domestic and wild animals suggests animal reservoirs for this virus [21, 22, 23, 24, 25, 26]. The animal sources might explain the high seroprevalence rate in school children and adults in contrast to preschool children in Turkey.

In conclusion, we showed a high seroprevalence rate for HAV in children in our study area. In contrast, the majority of children lacks protective immunity to HEV in an area where a potential for HEV outbreak exists. Future studies are needed to determine the dynamics and other modes of transmission of HEV in pediatric age groups. Also, the investigation of the genetic relationship between the virus infecting humans and the virus infecting other animal species within the same geographic region surely will help us to understand the natural history of HEV. Meanwhile, every effort should be made to implement public health measures to control HAV and HEV infections as well as other enteric transmitted diseases in developing countries.

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