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Research Article

OCCURRENCE OF HEPATITIS A VIRUS AMONG CHILDREN IN A SEMI-URBAN TERTIARY CARE INSTITUTE, TAMILNADU

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Abstract: Hepatitis A is a common acute infectious disease which may lead to degenerative changes in most of body organs. The common site of Hepatitis A infection is contributed to the liver, which leads to impaired liver functions. Hepatitis A belongs to the group of RNA virus which commonly spreads through oral route, food and water contamination. It may spread through blood products but the prevalence rate is very less. Symptoms typically appear 3 to 8 weeks after the initial infection. During the acute stage of the infection, the liver enzyme alanine transferase (ALT) is present in the blood at levels much higher than in normal. The enzyme are released by the liver cells that have been degenerated by the virus. Hepatitis A can be prevented by vaccination, good hygiene and sanitation. **Materials And Methods** The present study was done on 137 children of age group around 6 months to 15 years. The serum sample was separated and tested for presence of anti-HAV antibodies using a commercially available ELISA kit. **Results** From our study we concluded that Out of 137 children 119 were found to be positive for anti-HAV antibody. The anti-HAV positivity rates were different among different age groups and the occurrence of anti-HAV antibody among children increased as age increases and was found to be maximum among the age group of 11 – 15 years. In the high socioeconomic group, the occurrence of anti-HAV antibody was low prevalence when compared to low socioeconomic group.
Key**words:** Hepatitis A virus, IgM, liver enzymes.

Introduction:

Hepatitis A virus (HAV) infection has a worldwide distribution and is endemic in many developing countries including India. Hepatitis A virus was discovered in 1973. Appearance was suggested by ancient scientist as enveloped, spherical, positive stranded RNA virus, it belongs to the family of picorna virus. The hepatitis A gene type was found to be a linear, single stranded, positive-sense RNA with secondary and tertiary structure. The prevalence of HAV varies from one population to another and is related to socioeconomic factors and living standards of the population.[1,3,11,] HAV infection causes significant morbidity and socioeconomic cost in many parts of the world. [2] Low prevalence of HAV infection has been reported from developed countries with high standard of hygiene and sanitation.[3,4] HAV infection is found to be endemic in developing countries and is common during childhood, which is usually mild and asymptomatic while adolescents and adults usually show symptoms of clinical Hepatitis. The HAV antibodies induced during childhood confer lifelong immunity against re-infection. [5] Previous reports on prevalence of HAV in India showed that 90% of Indian children in the age group of 5 - 10 years had anti-HAV antibodies.[6] However, recent studies from India show lesser prevalence of anti-HAV antibodies among children. Although the age of exposure to Hepatitis A has been increasing in the Tamilnadu, children and young adults remain the primary target. The seroprevalence of Hepatitis A in children younger than 25 years has been reported as 29.3%.[7,8] Hence we decided to study the prevalence of anti-HAV antibodies among children in and around a semi-urban tertiary care institute, Tamilnadu.

Methods:

The present study was conducted in the Department of Microbiology, Melmaruvathur Adhiparasakthi Institute of Medical sciences and Research, Melmaruvathur, Tamilnadu from March 2012 to February 2013 (one year). Institutional Ethical committee clearance was obtained for the study. Informed consent was obtained from the parents of the participants of this study. 5 ml of blood was drawn from 137 children (age group 6 months to 15 years) who attended our institution for minor illness without any history of acute Hepatitis and without any history of HAV vaccination. A detailed clinical examination and relevant history was collected from the parents of the participants of this study. Based on the financial income of the parents, the participants were divided into higher socio-economic status and lower socioeconomic status. The serum was separated and tested for presence of anti-HAV antibodies using a commercially available ELISA kit (Organon Teknika, The Netherlands) for anti-HAV IgM. The test was performed as per manufacturer's instructions. Sera showing in determinate results were retested and those showing indeterminate again were considered negative. Relationship of anti-HAV antibody status with increasing age was studied by applying Chi-square test for trend of antibody prevalence in 3 different age groups, namely 0-5 years, 6-10 years and 11-15 years.

Results:

TABLE1: Shows the prevalence rates of antibodies to HAV among children in various age groups.

Age group (years)	Number of participants	Number positive for anti-HAV antibody*
0 - 5 years	37	26 (70.3%)
6 - 10 years	54	49 (90.7%)
11 - 15 years	46	44 (95.7%)
Total	137	119 (86.86%)

* Chi-squared test for trend, $p < 0.05$ which is statistically significant.

LEGEND 1 -Out of 137 sera samples tested, 119 (86.86 %) were found to be positive for anti-HAV antibody. The anti-HAV positivity rates were different among different age groups and the occurrence of anti-HAV antibody among children increased as age increases and was found to be maximum 95.7% among the age group of 11 – 15 years.

TABLE 2: shows the age specific prevalence of HAV antibodies according to socioeconomic status.

Age group (years)	Total anti-HAV positive	High socioeconomic status	Low socioeconomic status
0 - 5 years	26	5 (19.2%)	21(80.8%)
6 - 10 years	49	20 (40.8%)	29 (59.2%)
11 - 15 years	44	16 (36.36%)	28 (63.64%)

LEGEND 2 .In the high socioeconomic group, the occurrence of anti-HAV was 19.2% in the age group of 0 – 5 years; 40.8% in the age group of 6 – 10 years and 36.36% in the age group of 11 – 15 years. In the low socioeconomic group, the occurrence of anti-HAV was 80.8% in the age group of 0 – 5 years; 59.2% in the age group of 6 – 10 years and 63.64% in the age group of 11 – 15 years. The anti-HAV was significantly higher in the lower socioeconomic group when compared to the high socioeconomic group.

Discussion:

The occurrence of HAV infection among children in this study was found to be 85.57%. The higher occurrence confirms that HAV infection is endemic in India despite recent improvement in the socioeconomic standards. Infections occur more commonly in population where sanitation is poor and living conditions are overcrowded and without improved sanitation and hygiene. Under these conditions explosive epidemics can arise from fecal contamination. It has been documented in earlier studies from different populations. From our study we found no relationship between anti-HAV antibody and gender difference.[1, 10] Our data shows that the occurrence of anti-HAV antibody among children increased with age and reached 95.7% by late childhood. This is in agreement with earlier observations regarding the epidemiology of HAV in the developing world, which is characterized by acquisition of infection early in childhood.[9] Our data are in more contrast with those reported recently from other Indian centers, which showed much lower anti-HAV positivity rates.[8, 9] Dawn PS et al… conducted study in Mumbai, they stated that anti-HAV was detected in only 77.5% and 83.3% of children in the age groups of 6 - 10 and 11 - 15 years respectively[5] and corresponding anti-HAV prevalence rates for children belonging to middle and upper socioeconomic strata were 75% and 65% whereas the prevalence was 91.3% among children of lower socioeconomic status.[7] Das K et...al conducted a survey conducted in Delhi, about the prevalence of anti-HAV antibody among children of age group around 11 - 20 years. There results showed that the prevalence rate was only around 39.8%. By statistical analysis they proved that the prevalence higher in lower socioeconomic status were 30.8% and 51.2% respectively [8]. Our study observed that HAV infection started at an earlier age in the low socioeconomic status than in the high socioeconomic group. The reason for the higher prevalence of anti-HAV antibodies among children belonging to lower socioeconomic status may be related to overcrowding, poor hygienic and living conditions, water contamination and improper sanitation. [11] The incidence of HAV infection is inversely correlated to living standards and decreases as living standards improve in any country[12]Also, it is possible that the prevalence of anti-HAV antibodies in different regions of the country is different. Larger epidemiological studies are necessary to elucidate the true reason for differences in prevalence of anti-HAV antibody in different parts of our country.[5] Our data thus emphasized the was a need for intensive, well planned, population based epidemiological studies in different parts of our country to promote health education throughout the urban and rural population which may help in creating awareness about the health hazards of HAV.

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