SEROPREVALENCE OF ANTIBODIES AGAINST HEPATITIS A (ANTI-HAV) IN SINGAPORE: THE NFDD EXPERIENCE

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ABSTRACT

At the 4th National Foundation for Digestive Disease (NFDD) Day in 1991 where public lectures on prevention of hepatitis and early detection of hepatocellular carcinoma were given, screening of sera obtained from 364 registrants for antibodies to Hepatitis A (IgG) was undertaken. The overall sero-prevalence rate was 50%, with 55% for males and 46% for females with antibodies for HAV. None of the subjects below 20 years old had antibodies to HAV. This rose to 16% for those 21-30 years old and 92% for those above 61 years. This study shows that in Singapore, prevalence of anti-HAV antibodies rise with age and is approaching the low endemicity pattern that is seen in developed countries.

Keywords: *antibodies against hepatitis A (Anti-HAV)*

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INTRODUCTION

Seroepidemiological studies in both developed and developing countries have demonstrated that prevalence of antibodies to hepatitis A increases with age[1-3] and is inversely related to the socio-economic status[4] of the country as well as the standards of sanitation and hygiene[4]. In most underdeveloped countries, with overcrowding and low standards of hygiene and sanitation, children become infected within the first few years of life, so that by the age of 10 years, almost the entire population is immune[4]. Infection during early childhood are either silent or mildly symptomatic and hepatitis A infection does not pose a serious clinical problem. In developed countries, however, the age specific prevalence of anti-HAV antibodies is a sigmoid curve with low prevalence among children and adolescents and a high prevalence among the elderly. This pattern can be explained by a decrease in the incidence of infection over the past 30 or 40 years as a result of improved sanitation and living standards[5]. A third pattern is seen in developing countries, with antibodies to hepatitis A found predominantly in adolescents and adults, showing that while hepatitis A infection do occur, the average age of infection has shifted to young adulthood.

In Singapore, surveys conducted in 1975, 1984-1985 and 1987-1991 in Singapore have shown that the level of exposure of Singapore children to HAV was declining as a result of the socio-economic progress made during the period[6,7].

The National Foundation for Digestive Diseases is a non-profit organisation formed in 1986 with the objectives of public education on diseases and function of the digestive system as well as to support research on disorders of the digestive system. To achieve these aims, the Foundation has held public seminar every year since its inauguration. This report summarises the result of a sero-epidemiological survey carried out at the 4th NFDD day on 21st July 1991 by the Foundation.

MATERIAL AND METHODS

A public seminar on "Early Detection and Prevention of Hepatitis and Hepatocellular Carcinoma" was planned for 21st July 1991 and was publicised through the local mass media. A "hot-line" to pre-register the public for the seminar was also established 3 days prior to the event. Screening for antibodies to hepatitis A (anti-HAV) was provided free for the first 400 registrants. Sera from 364 registrants were taken at the NFDD Day 1991 and tested for anti-HAV IgG using a commercially available test kit (HAVAB, Abbott-Labs). Biodata (age, sex, name) were also recorded. Statistical analysis was performed using x^2 with a value of $p < 0.05$ considered significant.

RESULTS

Three hundred and fifty-nine sera were included. Five other samples with incomplete biodata were excluded. The age range was from 10 years - 75 years (mean age : 38.7 years). The overall seroprevalence rate of anti-HAV IgG was 50% (182/359). Of the 149 males tested for anti-HAV, 55% were anti-HAV positive. Forty-six percent of 210 females were positive for anti-HAV. The difference was not statistically significant. The prevalence of anti-HAV increases with age (Fig 1). None of the subjects between 10 - 20 years were anti-HAV positive. This rose to 16% for subjects between 21- 30 years and 92% for subjects above 61 years old.

DISCUSSION

Hepatitis A has a worldwide distribution but with differing levels of endemicity that depend on the standard of sanitation, as well as the prevailing socio-economic and hygienic condition. As

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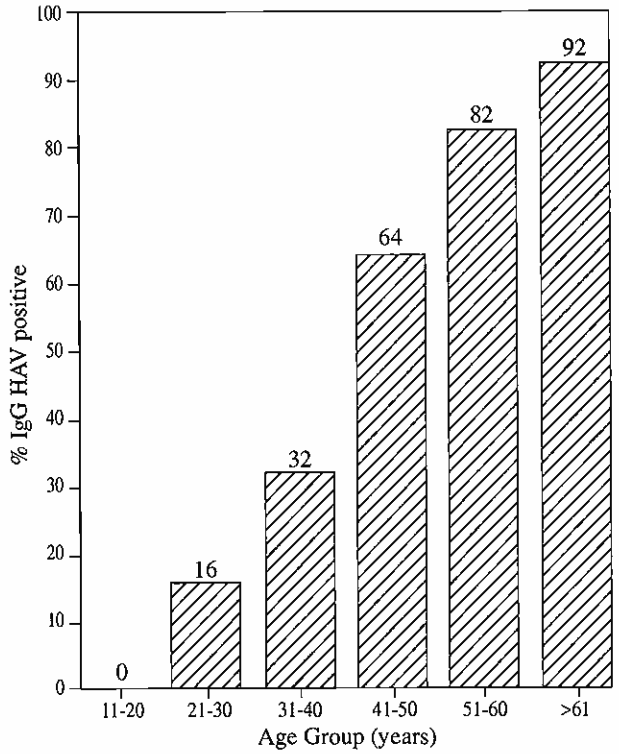
Fig 1 – Age distribution of antibodies to hepatitis A virus



economic development occurs and the standard of sanitation improves, the incidence of hepatitis A decreases, resulting in a change of the epidemiological pattern over time[8]. From a study of hepatitis A morbidity, it can be seen that in developed countries with temperate climates, hepatitis A appears to occur in epidemic waves with peaks about every seven years, suggesting that this is the time needed for a sufficient number of susceptible people to accumulate to sustain an epidemic[9]. Whilst this cyclical pattern was a feature of the epidemiology in developed countries during the 1950's, 60's and 70's, and is still seen in Wales and in UK[9], the continuing decline in the incidence of many countries has resulted in a pattern that does not have such cyclical peaks. With the introduction of serological tests for hepatitis A antibodies, it is possible to determine the sero-epidemiology in a given country at a particular point in time. Studies of sero-epidemiology using tests for antibodies (IgG) to hepatitis A have been reported from many countries worldwide, and reports from Spain[4] and Greece[5] for instance have noted a changing pattern of the sero-prevalence of hepatitis A with respect to age in recent years. The sero-prevalence rate for children and adolescents is low but it rises with increasing age. Goh et al and Yap et al also noted a similar change in Singapore when they studied age-specific seroprevalence rates in 1984/1985[6] and 1987 to 1991[7].

The present study was based on a one-day survey performed on individuals who for one reason or another are interested in knowing whether they had hepatitis A infection. Hence the overall sero-prevalence rate of this population at 50% was definitely higher than the 31.8% reported in 1987 and 21.4% in 1991. The difference could also be due to more older subjects in the present study. The notable difference was that in the present survey, none of the population below 20 years old had antibodies to hepatitis A. Both studies showed that there was no significant gender difference in the seroprevalence. It would appear that in the 90's in Singapore, hepatitis A infection is no longer an infection of children and adolescents, as it used to be in the 70's and 80's and is approaching the low pattern endemicity that is encountered in the developed countries. With a large pool of young people in our population with no immunity, a case could be made out for vaccination of young adults, particularly those who travel to endemic areas within the region. From this study, based on cost benefit consideration, it would not be mandatory to test for anti-HAV before vaccination in Singaporeans below 20 years as the sero-prevalence is almost zero. This survey also demonstrates that it is possible to collect epidemiological data in conjunction with events primarily aimed at public education.

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