

10-1-1996

## Seroepidemiology of hepatitis - A virus infection among school children in Bangkok

Thospom Vimolkej

Voranush Chongsrisawat

Apiradee Theamboonlers

Yong Poovorawan

Follow this and additional works at: <https://digital.car.chula.ac.th/clmjjournal>



Part of the [Medicine and Health Sciences Commons](#)

---

### Recommended Citation

Vimolkej, Thospom; Chongsrisawat, Voranush; Theamboonlers, Apiradee; and Poovorawan, Yong (1996) "Seroepidemiology of hepatitis - A virus infection among school children in Bangkok," *Chulalongkorn Medical Journal*. Vol. 40: Iss. 10, Article 7.

Available at: <https://digital.car.chula.ac.th/clmjjournal/vol40/iss10/7>

This Article is brought to you for free and open access by the Chulalongkorn Journal Online (CUJO) at Chula Digital Collections. It has been accepted for inclusion in Chulalongkorn Medical Journal by an authorized editor of Chula Digital Collections. For more information, please contact [ChulaDC@car.chula.ac.th](mailto:ChulaDC@car.chula.ac.th).

## Seroepidemiology of hepatitis - A virus infection among school children in Bangkok.

Thosporn Vimolkej\* Voranush Chongsrisawat\*\*  
Apiradee Theamboonlers\*\* Yong Poovorawan\*\*

Vimolkej T, Chongsrisawat V, Theamboonlers A, Poovorawan Y. Sero-epidemiology of hepatitis - A virus infection among school children in Bangkok. Chula Med J 1996 Oct;40(10): 815-20

**Background** : *The seroepidemiological study of hepatitis-A virus infection is useful for preventive measures.*

**Objective** : *To study the seroprevalence of anti HAV among primary and secondary school children in Bangkok.*

**Methods** : *We studied the seroprevalence of hepatitis-A virus antibody (anti-HAV) among primary and secondary school children of different age groups in Bangkok, Thailand in 1996. The sera of 260 primary and 245 secondary (age 4-19 years) were tested for anti-HAV by the ELISA method.*

**Results** : *Immunity against hepatitis-A was detected in 9.2% of the primary and 12.7 % of the secondary school children. Increased natural antibody against the hepatitis-A was detected with increasing age.*

**Conclusion** : *The seroepidemiological study of HAV may act as a guide to the proper age for immunization and for other future preventive strategies.*

**Key words** : *Anti-HAV, Seroepidemiology, Seroprevalence, Children.*

Reprint request: Vimolkej T, Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Received for publication. September 5, 1996.

\*Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University.

\*\*Viral Hepatitis Research Unit, Department of Paediatrics, Faculty of Medicine, Chulalongkorn University.

ทศพร วิมลเก็จ, วรนุช จงศรีสวัสดิ์, อภิรดี เทียมบุญเลิศ, ยง ภู่วรรณ. ระบาดวิทยา ภูมิคุ้มกันของไวรัสตับอักเสบ เอ ของเด็กนักเรียน ในกรุงเทพมหานคร. จุฬาลงกรณ์-  
เวชสาร 2539 ต.ค.;40(10): 815-20

เหตุผลของการทำวิจัย : การศึกษาทางระบาดวิทยาภูมิคุ้มกันของไวรัสตับอักเสบ เอ จะมี  
ประโยชน์ในการใช้เป็นข้อมูลในการวางแผนการป้องกันโรค

จุดมุ่งหมาย : เพื่อศึกษาถึงระบาดวิทยาภูมิคุ้มกันของไวรัสตับอักเสบ เอ ใน  
นักเรียนเขตกรุงเทพมหานคร

วิธีการ : ได้ทำการศึกษาหาภูมิคุ้มกันไวรัสตับอักเสบ เอ (anti-HAV) ใน  
เด็กนักเรียนประถมศึกษาและมัธยมศึกษาในกรุงเทพมหานครในปี  
พ.ศ. 2539 จำนวน 260 และ 245 คน ตามลำดับ อายุตั้งแต่ 4-19 ปี  
ตรวจ anti-HAV โดยวิธี ELISA

ผลการศึกษา : เด็กนักเรียนประถมศึกษาและมัศึกษามีภูมิคุ้มกันแล้วจำนวน  
9.2 และ 12.7 เปอร์เซ็นต์ตามลำดับ และยังพบว่าเด็กในแต่ละกลุ่ม  
อายุที่เพิ่มขึ้น จะมีจำนวนเปอร์เซ็นต์ที่พบ anti-HAV เพิ่มขึ้น

สรุป : การศึกษาทางระบาดวิทยาภูมิคุ้มกันของไวรัสตับอักเสบ เอ จะเป็น  
แนวทางหนึ่งในการช่วยวางแผนการป้องกันโรคดังกล่าว โดยเฉพาะ  
กลุ่มเป้าหมายที่เหมาะสมในการฉีดวัคซีน

Hepatitis-A virus is an RNA virus in the picornaviridae.<sup>(1)</sup> Its transmission is via the oro-fecal route and it has a 4 weeks incubation period. In the younger age group it is asymptomatic while symptomatic cases are found in the older age group. The study of an HAV outbreak in primary school children in Nakhon Srithammarat province revealed that the asymptomatic to symptomatic ratio was approximately 1.1.<sup>(2)</sup> Hepatitis-A infection has a low mortality rate. In a study in Shanghai, China in 1988 in which the outbreak lasted for 10 months 47 of 310, 746 cases died, and most of the deaths were adults with chronic liver disease eg. chronic hepatitis, cirrhosis.<sup>(3)</sup> The mortality rate was about 0.04 per 1,000 in the 5 to 14 years age group but as high as 27 per 1,000 among adults whose age was more than 49. The spread of hepatitis-A virus infection largely depends on socioeconomic status and the sanitation conditions of the population. In developing countries, the infection mostly occurs in younger children who acquire natural immunity by the time they are adults. Contrary to the western or other developed countries, there are small numbers of children with naturally acquired immunity. The only naturally immunized older age group are adults who had a history of hepatitis-A infection in the past. Major hepatitis-A infections are more likely to occur in countries where the socioeconomic status is changing to a better state. In newly industrialised countries where the socioeconomic and health status is improving the prevalence of hepatitis-A virus infections is low, though most

children and teenagers are susceptible due to low immunity. Infection in teenagers or adults would be symptomatic and could lead to an epidemic infection, especially in the schools, factories and day care centers or nurseries. Our study of the seroepidemiology of hepatitis-A virus reveals the current status of the disease and can be used for preventive measures. Our objective was to obtain seroepidemiology data for primary and secondary school children in Bangkok, and to utilize this data for future preventive measure planning.

## Material and Methods

### Population study

The subjects were 260 primary school students from Plookjit primary school, Bangkok Metropolitan Municipal with low to middle socioeconomic status and 245 secondary school students from Wat Sungwej secondary school, Ministry of Education, Bangkok with middle socio economic backgrounds. The central area of Bangkok was selected for the seroepidemiological study. This study was done during the prevaccination screening of the hepatitis-A vaccination program study. Written consents were obtained from the subject's parents prior to entry into the study.

### Laboratory tests

Venous blood were taken and separated into sera within 24 hours. All serum samples were stored at  $-20^{\circ}\text{C}$  until tested. Anti-HAV was detected by the ELISA method. We used a commercially available HAVAB EIA kit (Abbott Laboratories, North Chicago, Illinois U.S.A.).

**Data analysis**

The data was analysed in percentage by age and presented in tables and graphs.

**Results**

Of 260 students from primary school, age range from 5 to 15 years, there were 129 males and 131 females, of 245 students from secondary

school age range from 12 to 19 years, there were 42 males and 203 females.

Twenty four of the 260 students in the primary school and 31 of the 245 students in the secondary school were seropositive to anti-HAV. The percentages were 9.2 and 12.7, respectively.

The age specific prevalence of anti-HAV markedly increased in the older age groups. (Fig.1 and Fig.2).

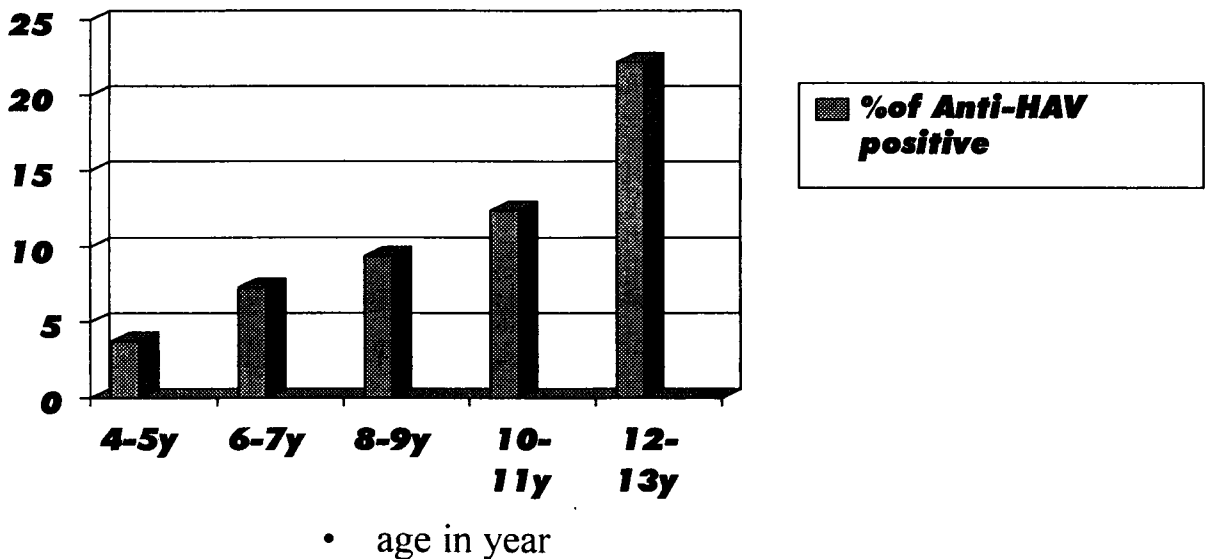


Figure 1. Age specific prevalence of Anti-HAV among primary school students in Bangkok.

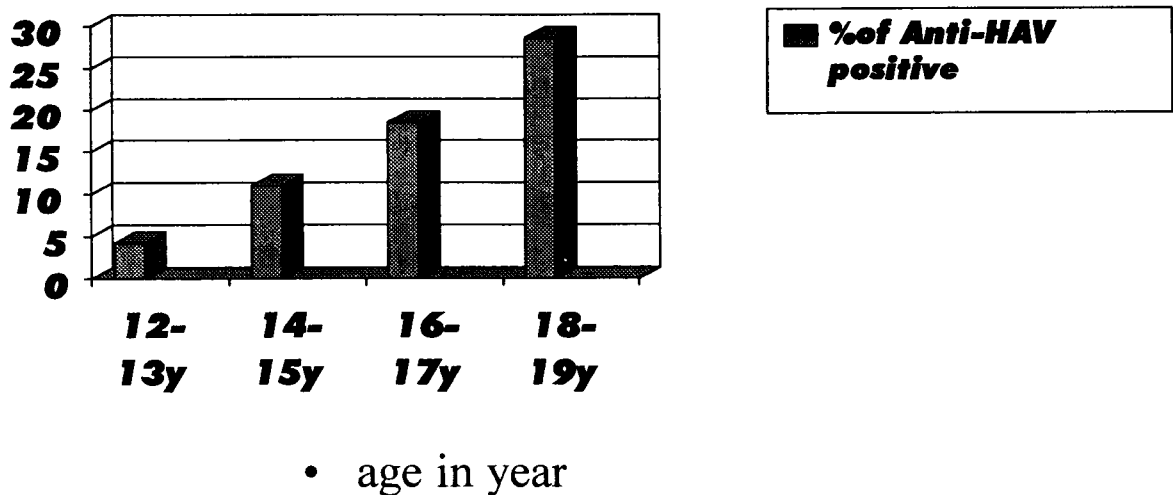


Figure 2. Age specific prevalence of Anti-HAV among secondary school students in Bangkok.

## Discussion

Due to improved socioeconomic status of Thai people, especially in Bangkok, the decline of anti-HAV positive children is high. Thai per capita income increased from US \$ 560 in 1980 to US \$2700 in 1995 (National Social and Economic Development Plan, 1996). The seroprevalence of hepatitis-A virus infection in Thailand has been changed from a hyperendemic area to an intermediate endemic area,<sup>(5,6)</sup> as in other newly industrialised countries eg. Taiwan and Singapore.<sup>(4)</sup> The decreased prevalence of naturally acquired immunity to HAV among adolescents may have resulted in the greater number of cases of clinical infection, including fulminant hepatitis.<sup>(7)</sup> In spite of its low mortality, lack of chronicity and hepatocellular carcinogenesis, HAV infection can occur in epidemics and cause large financial losses. Since contaminated stool represent the primary source of transmission of HAV, improving personal hygiene and sanitation standards will greatly decrease the spread of this disease. Another preventive measure is HAV immunoprophylaxis. A trial of inactivated vaccine derived from an HM 175 strain was evaluated among 40,119 Thai children aged 4-15 years. That study showed 94 per cent protective efficacy. Persons recommended for hepatitis-A vaccination are travelers to endemic areas, military personnel, daycare center children and employees, food handlers, homosexual men, injecting drug users, residents and staffs of institutions for the developmentally disabled, health care workers,

sewage workers, and residents of communities experiencing protracted outbreaks of hepatitis-A. From this study we determined that lowered seroprevalence in the over 10 years age group<sup>(6)</sup> may lead to an HAV epidemic. However these data were studied in Bangkok, the capital of Thailand. Further studies in different part of Thailand and socioeconomic should be studied. In the future, immunization will be the main prevention for outbreaks of hepatitis-A virus infection. The prevention for outbreaks of hepatitis-A virus infection.

## References

1. Feinstone SM, Kapikian AZ, Purcell RH. Hepatitis A: detection by immune electron microscopy of a virus like antigen associated with acute illness. *Science* 1973 Dec 7;182:116:1026-8
2. Sinlaparatsamee S, Nuiem J, Kankao J, Theamboonlers A, Chumdermpadetsuk S, Poovorawan Y. An outbreak of hepatitis A in school children at Nakhon Si Thammarat, Southern Thailand. *Southeast Asian J Trop Med Public Health*, 1995 Mar;26(1): 104-8
3. Yao G. Clinical spectrum and natural history of viral hepatitis A in a 1988 Shanghai epidemic. In: Hollinger FB, Lemon SM, Margolis HS, eds. *Proceedings of the 1990 International Symposium on Viral Hepatitis and Liver Disease*. Baltimore: Williams and Wilkins, 1991:76-8

4. Yap I, Guan R. Hepatitis A sero-epidemiology in Singapore: a changing pattern. *Trans R Soc Trop Med Hyg* 1993 Jan;87(1):22-3
5. Innis BL, Snitbhan R, Hoke CH, Munindhorn W, Laorakpongse T. The declining transmission of hepatitis A in Thailand. *J Infect Dis* 1991 May;163(5):989-95
6. Poovorawan Y, Theamboonlers A, Chumdermpadetsuk S. Changing seroepidemiology of hepatitis A virus infection in Thailand. *Southeast Asian J Trop Med Public Health* 1993 Jun;24(2):250-4
7. Sherlock S, Dooley J. Fulminant Hepatic failure. In: Sherlock S, Dooley J, eds. *Diseases of the Liver and Biliary System*. Oxford: Blackwell Scientific Publication, 1993:102-13