

Age-Specific Prevalence of Anti-Hepatitis A Virus Antibody in Thailand

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OBJECTIVE : To determine the age-specific prevalence of anti-HAV antibodies in healthy Thais.

INTRODUCTION : In the few developing countries thus far studied most life-long residents become infected with the hepatitis A virus (HAV) before reaching adulthood (1-2). We report here our observations on the age-specific prevalence of antibody to hepatitis A (Anti-HAV) in three geographically defined populations of healthy Thais.

METHODS :

Study Populations : Three populations were studied, each of which had previously been the subject of epidemiologic studies by this Institute.

1. Huay Khwang District (Bangkok) : In 1971-73, random households in a low income housing project were selected for investigations of the epidemiology of hepatitis B virus infections (3). Of the 687 original subjects, serum specimens were available from 569 (83% of the original population). From a list of subjects with available specimens, subjects were stratified by age and a sample was chosen at random so that approximately 20 sera were tested for each two year age group less than 15 and each five year age group over 15. The total number of specimens tested was 308. Ninety percent of the specimens tested were drawn from blood sample taken between 20 July and 10 October 1971 and 10% were from samples taken between 10 April and 9 June 1972.

2. Ban Tablan: In late 1976, an attempt was made to obtain blood specimens from all of the residents of a relatively isolated rural village approximately 250 km north west of Bangkok, again for studies of hepatitis B virus (4). Of the total population of 1,014, blood specimens were obtained from 774 individuals (76% of the population). From these sera, specimens were chosen at random to obtain approximately 15-20 specimens for testing from each age bracket. The total number of specimens tested was 206.

3. Phibunprachasan School, Din Daeng District (Bangkok) : In 1977, a survey of togavirus and hepatitis B virus infections was made at a lower-middle class public school in Bangkok (5). Blood specimens were obtained from 1,977 children, 98% of the school population. From each 2-year age group, approximately 40 sera were chosen at random for testing. The total number of specimens tested

was 232. All serum specimens had been preserved frozen at -20°C until tested.

Anti-HAV testing : A commercial solid phase competition I^{125} radioimmunoassay kit was used (HAVAB (R), Abbott Laboratories) in accordance with the manufacturer's recommendations. For titering, serial 10 fold dilutions of serum were made in phosphate buffered saline without added protein.

Anti-HBs and HBsAg testing : Sera were assayed for evidence of previous hepatitis B virus infection with commercial kits (AUSAB (R) and AUSRIA-II (R), Abbott Laboratories).

Poliovirus neutralizing antibody testing : Sera from the Huay Khwang and Phibunprachasan collection were tested for neutralization of 100-300 TCID₅₀ prototype poliovirus types 1, 2 and 3 in Hela cells. Dilutions of sera and virus were incubated together for 30 minutes at room temperature in micro-titer plates. Cell suspensions were inoculated into the wells with the serum-virus mixture and covered with a layer of mineral oil. Plates were incubated at 37°C and endpoints were read by the metabolic inhibition method on days five to seven. Sera with titers of 1:5 were interpreted as negative for antibody (6).

RESULTS :

Age specific prevalence of anti-HAV antibody : The prevalence of anti-HAV serum antibody in the three populations studied is presented in Figure 1. The age at which approximately 50% prevalence was attained was four to five years for Huay Khwang residents, 8 to 9 years for Ban Tablan village residents, and 10 to 11 years for Phibunprachasan school children. After age 15, the antibody prevalence approached 100% in all three populations. Antibody prevalence, or more specifically, the prevalence of the lack of antibody did not appear to be either family or household associated. In the three populations, there was no apparent difference in the age-specific antibody prevalence between males and females.

Anti-HAV antibody in adults and children : Ninety-four percent of adults (16 years of age or older) tested from Ban Tablan were antibody positive (51/54), as were 98% (159/163) of adults from the Huay Khwang district. Determination of the anti-HAV antibody titer of all positive serum specimens from young children (less than eight years old) and 12 positive specimens from adults (more than 40 years old) from Huay Khwang showed geometric mean titers (mean \pm S.D.) of 1:700 \pm 130 for children and 1:240 \pm 70 for adults.

Anti-HAV prevalence and anti-poliomyelitis virus prevalence : Among those five yearsold in the Huay Khwang population, the percent of children with neutralizing antibodies to polio types 1, 2 and 3 were 74%, 95%, and 80% respectively, and among five year olds at the Phibunprachasan school the comparable percentages were 82%, 87% and 84%. Table 1 compares the age-specific prevalence of anti-HAV for children with antibody to all three poliovirus types with that for children lacking antibody to one or more poliovirus types. There is no detectable difference.

Anti-HAV prevalence and HBV marker prevalence : Table 1 presents the prevalence of anti-HAV in relation to previous exposure to hepatitis B virus (HBV) for children two to nine years of age in the Huay Khwang and Ban Tablan populations. There is no difference in prevalence of anti-HAV between those with previous exposure to HBV and those without exposure.

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Table 1. Prevalence of Anti-HAV in Various Age Groups of Children in Relation to Poliomyelitis Virus and Hepatitis B Virus Exposure Status

	2-3		4-5		6-7		8-9	
	No. tested	No. positive (%)						
<u>Poliomyelitis virus exposure status</u>								
Polio positive ^a	4	2(50)	36	12(33)	36	18(50)	34	19(56)
Polio negative ^b	14	3(21)	23	9(39)	20	9(45)	20	10(50)
<u>HBV exposure status</u>								
HBV positive ^c	9	2(22)	13	6(46)	14	7(50)	8	6(75)
HBV negative	30	5(17)	35	12(34)	27	16(59)	33	22(67)

^a Serum polio neutralizing antibody titer $\geq 1:5$ for all three polio types.

^b Serum polio neutralizing antibody titer $< 1:5$ for a least one polio type.

^c Either HBsAg or anti-HBs detectable in serum.

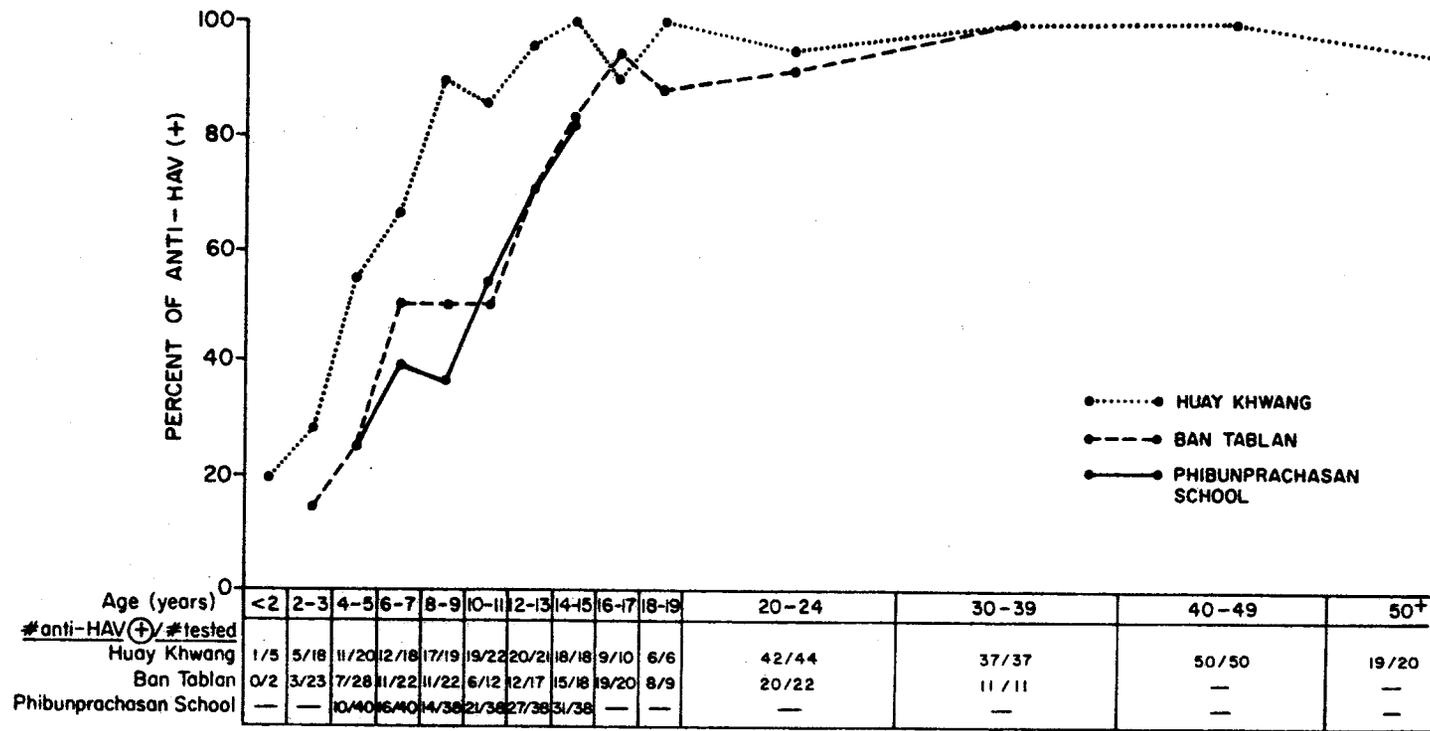


Figure 1. Age Specific Prevalence of Anti-HAV in Three Populations of Healthy Thais.