

A Serological Survey for Togaviruses (Arboviruses)
in a Well Defined Rural Thai Population

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OBJECTIVE : To study the seroepidemiology of togavirus (arbovirus) infections in a well defined rural Thai population.

BACKGROUND : As reported previously¹ sera were collected in 1975-6 from a relatively isolated rural village in central Thailand in conjunction with a malaria chemosuppressive trial. In order to assess the extent to which a rural population is subject to dengue infections, these sera were tested. This report concludes that study.

METHODS : The methods used for this study are outlined elsewhere in this report (A Longitudinal Serologic Study of a Bangkok School Population).

RESULTS : Of the total population of 1024 people in this village, sera from 638 individuals were tested. The distribution of the antibody against alphaviruses and flaviviruses are presented in Tables 1 and 2 respectively.

Because of the antigenic similarity between dengue viruses and Japanese B encephalitis virus (JEV), cross-reacting antibody to both viruses is common following a dengue infection; however, very low-titered or no dengue antibody is formed following a primary JEV infection. Of the 563 flavivirus positive individuals, only 24(4%) had either an isolated JEV titer or a JEV titer at least four times greater than the highest dengue titer. Because of the small number of JEV identifiable infections and their apparent lack of clustering, the prevalence of antibodies against dengue virus and JEV were combined in Table 2.

Since many of the serum specimens had been previously examined for the presence of hepatitis B virus (HBV) antigen and antibody², the association between these markers of previous HBV infection and markers of togoviral infection was examined. As can be seen in Table 3, the probability that the associations noted for HBV and JEV and alphavirus are due to chance alone is very small.

(The majority of "JEV antibody" identified in Table 3 is probably non-specific antibody formed in response to a previous dengue infection, particularly dengue type IV). These associations appear to be age and sex dependent. Children, 10 years of age and under who had previously been infected with HBV, are at higher risk of concurrent evidence of togoviral infection than their non-HBV infected contemporaries. This increased risk appears to remain for life,

but becomes diluted to some extent as a greater proportion of the entire population becomes infected with various togoviral agents. Tables 4 and 5 present the relative risk patterns of "JEV antibody" and alphaviral antibody respectively.

A manuscript of this (completed) project has been submitted for clearance.

REFERENCES :

1. Scott, R.M. *et al.* The Annual Progress Report AFRIMS 1977-78, p. 49-52.
2. Johnson, D.E. *et al.* Hepatitis B in the Rural Tropics. Int. J. of Epid (in press).

Table 1. Prevalence of Anti-Alphavirus Antibody in a Rural Thai Population

Age	Male			Female			Total		
	No. tested	Alphavirus antibody		No. tested	Alphavirus antibody		No. tested	Alphavirus antibody	
		No.	%		No.	%		No.	%
<1	2	0		3	0	-	5	0	
2-3	17	0		15	0		32	0	
4-5	22	1	4.5	35	2	5.7	57	3	5.3
6-7	27	2	7.4	39	3	7.7	66	5	7.6
8-9	26	3	11.5	15	0		41	3	7.3
10-14	45	8	17.8	60	13	21.7	105	21	20.0
15-19	32	12	37.5	34	6	17.6	66	18	27.2
20-29	41	12	29.3	67	17	25.3	108	29	26.8
30-39	29	17	58.6	46	16	34.8	75	33	44.0
40-49	24	13	54.2	22	10	45.5	46	23	50.0
>50	15	7	46.7	22	12	54.5	37	19	51.3
Total	280	75		358	79		638	154	

Table 2. Prevalence of Anti-Flavivirus Antibody in a Rural Thai Population

	No. tested	Flavivirus antibody		No. tested	Flavivirus antibody		No. tested	Flavivirus antibody	
		No.	%		No.	%		No.	%
<1	2	1	50.0	3	0		5	1	20.0
	17	7	41.2	15	8	53.3	32	15	46.9
4-5	22	17	77.2	35	31	88.6	57	48	84.2
6-7	27	21	77.7	39	33	84.6	66	54	81.8
8-9	26	20	76.9	15	11	73.3	41	31	75.6
10-14	45	38	84.4	60	55	91.7	105	93	88.6
15-19	32	30	93.7	34	33	97.1	66	63	95.4
20-29	41	41	100.0	67	63	94.0	108	104	96.3
30-39	29	28	96.5	46	45	97.9	75	73	97.3
40-49	24	24	100.0	22	22	100.0	46	46	100.0
>50	15	14	93.4	22	21	95.4	37	35	94.6
Total	280	241		358	322	-	638	563	

Table 3. Association Between Previous Exposure to Hepatitis B Virus and Togovirus Agents

Evidence of HBV exposure	Total villagers tested	Evidence of exposure to Togoviral agent					
		Dengue		JEV		Alphavirus	
		+	-	+	-	+	-
+	261	229	32	222	39	86	175
	377	314	63	269	108	68	309
		$\chi^2_y = 2.07$		$\chi^2_y = 15.57$		$\chi^2_y = 17.93$	
		N.S.		p < 0.0005		p < 0.0005	

Table 4. Relative Risk of Concurrent Evidence of Japanese B Encephalitis Virus Exposure and Hepatitis B Virus Exposure

	Sex	Hepatitis exposure	JEV Exposure		RR*
			+		
<u><10</u>	F	+	17	12	1.20
			45	47	
	M	+	14	12	1.08
			42	42	
	F	+	97	9	1.01
			119	12	
	M	+	94	6	1.04
			63	7	
RR* for :					
	all males	1.26	all <u><10</u>	1.14	
	all females	1.14	all >10	1.02	
	all villagers	1.19			

Relative Risk

Table 5. Relative Risk of Concurrent Evidence of Alphavirus Exposure and Hepatitis B Virus Exposure

	Sex	Hepatitis exposure	Alphavirus exposure		RR*	
			-	+		
<u><10</u>	F	+	3	26	2.38	
			4	88		
	M	+	5	21	3.23	
			5	79		
	F	+	38	68	1.38	
			34	97		
	M	+	40	60	1.12	
			25	45		
RR* for :			all males	1.83	all <u><10</u>	2.84
			all females	1.78	all >10	1.29
			all villagers	1.83		

Relative Risk