

BODY OF REPORT

SEATO Medic Study No. 6 Overt and Inapparent Infections with Arboviruses in Americans Assigned to Thailand

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S. E. Asia

Task 01: Military Medical Research Program
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SEASIA (Thailand)

Reporting Installation: US Army-SEATO Medical Research Laboratory
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 Division of Medical Research Laboratories

 Department of Virology

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Objective: This study evaluates the health hazards of viral diseases to temporary residents of Thailand.

Description: The study is concerned primarily with arthropod-borne viruses although specimens for enteric and respiratory virus study are also collected. Virologic study is made of febrile patients seen at the JUSMAG Medical Unit or admitted to the Bangkok Sanitarium and Hospital. Acute and convalescent serum and throat and rectal swabs are collected from each patient. Serologic survey is made of incoming military personnel and dependent families before and after the rainy season (Hemorrhagic fever season). Attempts are made to estimate rates of overt, subclinical and inapparent infection.

Progress: During April 1964, 6 U.S. personnel participating in Operation Boon

Choo were seen in the Dispensary, 332nd ABS in Ubol, Thailand, with signs and symptoms resembling dengue fever. No serologic studies were made of these infections. During the 4th week of May an identical illness was observed among USAF and RAAF personnel stationed in Ubol. At the same time children were admitted to Ubol Hospital with a disease characterized by shock, hepatomegaly and 10% mortality rate. Virologic studies have shown that these illnesses were due to dengue viruses identical or similar to dengue type 1. This study reports the epidemiologic and virologic studies of dengue fever among USAF and RAAF personnel in Ubol between May and August, 1964.

Description of Study Area. Ubol is a provincial capital with approximately 30,000 inhabitants situated on the Mun and Chi Rivers, approximately 300 miles northeast of Bangkok and 40 miles from Mekong River and the Laos border. Units of the Royal Australian and United States Air Forces are situated in permanent cantonment on either side of the Ubol air field. The air field touches upon the outskirts of the densely inhabited portion of the town. In addition, 2 smaller US Army Units (5-10 men) were situated in the area; one near the air field and the other in Warin, a town of 7,000 located approximately 5 miles west of Ubol.

A number of the US officers and enlisted men occupied permanent quarters in Ubol town. With few exceptions men availed themselves of the plentiful and cheap transportation to spend off duty hours (both day and evening) in various portions of the town.

US personnel are assigned generally for a period of 1 year except for visitors and augmentations which occur during the military exercises (such as Operation Boon Choo April 1964). Australian personnel were assigned on rotation varying from 6 weeks to 1 year. Approximate US and RAAF strengths were, respectively, 160 and 130.

Virologic Studies. During the first week of June 1964, Captain Stephen Benak, MC, USAF 332nd ABS and Sqd/Ldr. M. R. Hoare, Dispensary Physician, RAAF Base, Ubol noted an unusual number of febrile illnesses severe enough to require bed rest among US and Australian personnel. These physicians spontaneously started collection of paired serum from acutely ill patients and notified the Virus Department, SEATO Medical Research Laboratory of the existence of the outbreak. As soon as this message arrived in Bangkok (14 June) an expedition to Ubol was mounted. From 17 June through 15 July one or more members of the Department were in Ubol to supervise collection of serum and dispensary data. After departure of the SMRL team convalescent and paired sera collection was continued by dispensary personnel.

Attempts were made to obtain paired sera or single convalescent sera on every member of both camps with a clinical diagnosis of dengue fever made during a dispensary visit. All sera were tested by HI against dengue and chikungunya antigens and by CF against dengue 1-4, and a dengue virus isolated from a hemorrhagic fever patient in the Ubol outbreak. Acute phase sera were tested after a period

Table 1

DENGUE VIRUSES RECOVERED FROM ACUTE PHASE SERUM (SPECIMEN COLLECTED WITHIN 5 DAYS OF ONSET OF FEVER) FROM CLINICAL DENGUE FEVER PATIENTS, U.S. AND R.A.A.F. PERSONNEL, UBOL, 1964

	Neg.	Host of virus isolation		
		SM	TC	SM and TC
Serum kept at 4°C	2	4	3	6
Serum kept at -65°C	0		4	4

of frozen storage in suckling mice and BS-C-1 cells either simultaneously or within a one week interval.

On 21 and 22 June, 122 and 140 men, respectively at the Australian and US camps were bled from the finger tip. Blood was collected in heparinized capillary tubes, centrifuged and the plasma separated and tested for dengue and chikungunya antibody.

Description of the Outbreak:

Etiology: Altogether 21 dengue type 1 viruses were recovered from the studied patients. Recovery rates of viruses from acute phase sera were extremely high even including specimens kept at 4°C for up to 2 weeks (Table 1). Twenty one viruses were recovered from 23 acute phase sera tested collected within 5 days of onset of fever.

Dengue Fever Attack Rate: During the period May through August 1964 a total of 46 physicians documented overt dengue fever cases were bled and virologically confirmed as recent dengue virus infection. These cases represented nearly every clinical infection on the 2 bases (see discussion below). Table 2 summarizes the status of clinical and virologic diagnoses.

Total dengue infections were between 29-35 among the Americans and 17-20 among the Australians using approximate US and RAAF base strength of 160 and

Table 2

SUMMARY OF CLINICAL AND VIROLOGICAL DENGUE INFECTIONS AMONG
VIROLOGICALLY STUDIED U.S. AND R.A.A.F. PERSONNEL, UBOL,
MAY - AUGUST, 1964

Disease or antibody status	No. personnel in category	
	U.S.	R.A.A.F.
- Overt illness, virologically confirmed as dengue	29	17
- Overt illness, specimens inadequate for study	4	0
- Status of illness not known, antibody compatible with remote or recent dengue infection *	2	3
- Overt illness, virologically <u>not</u> dengue	10	10

* See table 4 for fuller explanation

DENGUE FEVER CASES UBOL OUTBREAK 1964

