STUDY REPORT

Title: Survey of Rickettsial Diseases in Thailand

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OBJECTIVE

To determine the distribution and seasonal variation of rickettsial diseases in Thailand; identify arthropod vectors and mammal reservoirs and alternate hosts, and serve as required as consultative laboratory.

DESCRIPTION

A search for evidence of infection of man and other animals by rickettsiae of scrub typhus, murine typhus, Q—fever and the spotted fever group is being carried out in Thailand, by means of isolation attempts and serologic methods.

Small mammals (primarily rodents) are trapped in selected areas. Ectoparasites are collected, identified and pooled. Tissue specimens and ectoparasite pools are inoculated into white mice or guinea pigs for isolation attempts.

Patients hospitalized with fever of unknown origin (FUO) from Korat and Ubol Provincial Hospitals were examined for evidence of rickettsial infection. Paired sera were collected from these patients for serologic diagnosis; in most cases a blood specimen was also inoculated into mice or guinea pigs for rickettsial isolation attempts. A single serum specimen was obtained from a sample of outpatients at these same hospitals. These specimens were used to derive crude antibody prevalence ratios.

PROGRESS

1. Scrub typhus ecology. A field trip was made in June 1968 to Pak Thong Chai, Korat Province, to complete seasonal studies in animals, at the site of the 1965 scrub typhus epidemic. All collections were made in sylvatic habitats. One R. tsutsugamushi strain was recovered from 49 tissue pools from 228 bats.

Table 1 presents the results of attempts to isolate scrub typhus rickettsiae from the blood of patients hospitalized with FUO. Two strains of R. tsutsugamushi were recovered from 127 patients at Korat Provincial Hospital, and twenty strains from 279 patients at Ubol Provincial Hospital. One year's collections were completed in April 1968 at Korat and in September 1968 at Ubol Provincial Hospitals. At both hospitals the number of FUO patients were larger and the number of agent recoveries more frequent in the rainy season than in the dry summer season.

For the same time periods paired sera from some of the FUO patients were collected, and examined for scrub typhus antibody by the indirect immunofluorescent (IF) test, using KG Kt antigen. Of 56 pairs from Korat Hospital one showed a 4—fold or greater titer rise between acute and convalescent specimens and one pair had a positive (>1:40) but unchanging titer. Of 65 pairs from Ubol Hospital diagnostic titer rise was demonstrated in 8 (12%) and 7 others had positive, unchanging titer. A diagnostic titer rise was demonstrable for each case where paired sera were obtained and rickettsiae were isolated from the blood.

Four sera were obtained from one patient hospitalized with FUO at Saraburi Provincial Hospital in September 1968 (Table 2). Evidence for serologic diagnosis of scrub typhus is demonstrated in both the Weil—Felix response and the titer rise to both the Karp and (more prominently) the Gilliam strain antigens.

2. Murine typhus and Q—fever. Two strains of R. mooseri were recovered from 82 FUO patients hospitalized March and April, 1968 at Korat provincial Hospital (from one male and one female), but no strains were recovered from Ubol Provincial Hospital patients.

All sera collected from inpatients and outpatients at both Provincial Hospitals in the northeast were examined for complement—fixing antibodies to Q—fever and murine typhus (see Table 3). At Ubol the prevalence of Q—fever antibody was 0.3% and of murine typhus 3.5%.

Dog sera from Bangkok municipal dog pound, and pig sera from the Bangkok slaughter house were collected in May and June, 1968, and tested for Q—fever complement—fixing antibody. There were 386 dog sera positive out of 783 tested (49.3%), with titers ranging from 1:10 to 160; all 596 pig sera were negative.

Sera from 987 small mammals, collected from June 1968 through March 1969 by the Ectoparasite Section of the Department of Medical Entomology, were tested for presence of CF antibodies. Collections were from 15 provinces throughout Thailand. Only 2 specimens were positive—one squirrel, Callosciurus caniceps with a CF titer af 1:80 to murine typhus and one tree shrew, Tupaia glis with a CF titer of 1:80 to Q—fever.

Approximately 10% of the 29,574 chiggers collected from these small mammals were tested (after pooling) by animal inoculation. No rickettsiae were recovered.

TABLE I

Monthly isolation of R. tsutsugamushi from patients with FUO hospitalized in Korat and Ubol provincial hospitals, Feb—Sept 1968.

Month	Season	Strains recovered/Patients	
		Korat	Ubol
Feb 1968		0/45	0/33
Mar ,,	Summer (Hot, dry)	2/46	0/33
Apr ,,		0/36	1/17
May ,,		—	0/34
Jun ,,	Rainy (Hot, wet)	—	6/43
Jul ,,		—	9/61
Aug ,,		—	4/51
Sept ,,		—	0/7
TOTAL		2/127 (1.6%)	20/279 (7.2%)

TABLE 2

Serologic testing on sera from a patient at Saraburi Provicnial Hospital, September 1968

Serum #	Date	Weil–Felix Reaction (Agglutinin Titer)			Indirect Immunofluorescent Test Scrub typhus antibody titer*		
		OXK	OX2	OX 19	Karp+	Gilliam+	Kato+
1	4 Sept	NEG	NEG	NEG	40	40	10
2	10 Sept	1:80	NEG	NEG	160	160	10
3	12 Sept	1:160	NEG	NEG	160	160	10
4	19 Sept	1:160	NEG	NEG	160	640	10

* Reciprocal serum dilution
+ Strain antigen

TABLE 3

Prevalence of complement–fixing antibodies for Q–fever and murine typhus from patients at Korat and Ubol, 1968

Province/Patient Status	Agent, No. positive*/No. Tested	
	Q–fever	Murine typhus
Korat/inpatient (April 1968)	0/36	2/36 (5.6%)
Ubol/inpatient (April–Sept 1968)	1/213 (0.5%)	4/213 (1.9%)
Ubol/outpatient	1/479 (0.2%)	20/479 (4.2%)
Ubol Total	2/692 (0.3%)	24/692 (3.5%)

* Positive = titer of 1:10 or greater