BODY OF REPORT

SEATO Medic Study No. 83	Rabies Study
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Subtask 01:	Military Medical Research Program SEASIA (Thailand)
Reporting Installation:	US Army-SEATO Medical Research Laboratory APO San Francisco 96346
	Division of Medical Research Laboratories
	Department of Veterinary Medicine
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Objective: To gather information on the incidence, distribution, spread and transmission of rabies, the danger of rabies infection to man and animals, the related epidemiological factors associated with rabies infection in Thailand and the effectiveness of control and therapeutic procedures.

Description: Rabies is a disease of major importance in Thailand. In 1963, fifty (50) human cases of rabies were reported in Bangkok alone and estimates for the rest of Thailand range from 1-4 times this incidence. The Thai Government has proposed a canine immunization program for Bangkok, however funds are not yet available to institute such a program. In provinces removed from Bangkok, no such program has been proposed. Stray animals have been and are currently being picked up and destroyed in Bangkok. A few provinces throw out poisoned meat about twice a year which is sometimes consumed by humans. No information is available on the wildlife reservoir of rabies in Thailand or of how it is spread from village to village. The success or failure of a canine immunizations program

can depend on the incidence of rabies in wildlife and the successful control of wildlife in urban areas.

Rabies control in Thailand is the responsibility of the Ministry of Public Health which suffers from a lack of funds for this program. Since rabies in man or animals is not a reportable disease in Thailand, information on incidence of rabies in the provinces is notably lacking. Frequently, the local public health official and veterinarian are unaware of rabies in the area, but diligent questioning reveals probable rabies deaths.

Figures on vaccinated animals are difficult to obtain as no one agency is presently responsible for such a program and it is very difficult to contact private practitioners in the area. Since there is no licensing program for dogs in Thailand, there is no way of knowing how many dogs are inThailand and hence obtain figures on percent vaccinated etc. When a dog is ascertained to be rabid, unless the animal is wearing a rabies tag, there is no way of knowing if vaccinated or not as ownership is difficult to determine and may even be denied because of liability involved. For these same reasons, the range of dog migration can not be presently determined.

The responsibility for the diagnosis of rabies rests with the Institute of Pasteur in Bangkok. Mouse inoculation test and negri body stains are the techniques employed. No effort has been made to solicit specimens and practically all specimens submitted are from Bangkok and the immediate vicinity thereof. A diagnostic capability now exists at SEATO Medical Research Laboratory and includes Negri body stains, mouse inoculation and fluorescent antibody techniques (FAT). Primary emphasis will be on the FAT.

Information on existing conditions will be collected from various sources. Efforts will be made to detail and map rabies exposure and infection. Both Bangkok and provincial areas will be investigated for source of human rabies infections. Necessary isolation and serological tests will be performed according to standard laboratory methods. A comparison of fluorescent antibody titer and neutralization antibody titer will be made. Clinical and therapeutic data will be collected as necessary.

Progress: Thirty-two dog heads, two (2) fish cat and two (2) domestic cat heads were submitted to the rabies diagnostic laboratory. Nineteen (19) were positive by FAT. Results are summarized in Table I. Ten of these were inoculated into mice and all were positive.

Case #V20-64 was found on the grounds of the Thai Army Hospital. One week earlier another dogs was seen in the same area (within 100 yards) with classical symptoms of typical rabies infection. Two (2) days prior to case #V20-64, another dog with symptoms suggestive of rabies was seen by Captain Spertzel approximately 1000 meters north of this same area.

Table I

POSITIVE CANINE RABIES CASES

Case #	Date	Province	Human Exposure US	Thai
V4-64	16 Oct 64	Cholburi	1	2
V5-64	21 Oct 64	Udorn	10	2
V7-64	27 Oct 64	Ubol	5	? *
V16-64	20 Nov 64	Cholburi	None known	10
V20-64	16 Dec 64	Bangkok	Unknown	Unknown
V23-64	22 Dec 64	Saraburi	-	3
V2-65	9 Jan 65	Cholburi	Unknown	Unknown
V3-65	9 Jan 65	Cholburi'	Unknown	Unknown
V6-65	27 Jan 65	Nakorn Sawan	2	2
V7-65	28 Jan 65	Chiengmai	Many	Many ?*
V9-65	4 Feb 65	Bangkok	-	3
V10-65	6 Feb 65	Bangkok	2	-
V15-65	2 Mar 65	Bangkok	-	3
V16-65	3 Mar 65	Bangkok'	Unknown	Unknown
V17-65	4 Mar 65	Bangkok	-	2
V19-65	9 Mar 65	Bangkok	Unknown	3
V22-65	17 Mar 65	Bangkok	2	2
V23-65	26 Mar 65	Bangkok	-	3
V24-65	26 Mar 65	Korat	1	2

* These dogs owned by Thai girls. Some Thai's must have been exposed but no treatment was given.

In early December in cooperation with the Public Health Department of Udorn who caught live stray dogs, 44 brains were examined. One of these 44 dogs showed signs suggestive of rabies infection. This dog was picked up in the middle of the morning market place. The brain of this dog and two (2) others were positive for rabies by FAT.

In March 1965 in cooperation with the Bureau of Public Health of Bangkok four hundred (400) stray dogs from the city pound were examined by FAT. One was positive.

In addition seventeen (17) dogs in Bangkok where US exposure was involved have been examined and observed. Most of these were three (3) to six (6) months old unvaccinated pups. All were negative.

The indirect FAT is being used to do fluorescent antibody titers on a limited number of personnel who have had previous rabies antigen exposure either by 14 shot treatment of 3 shot prophylactic Duck embryo vaccine series. Log neutralizing index of these same sera are being done and a comparison is being made between the Log neutralizing index and FAT titers. To date 21 sera have been examined. These limited results suggest the following relationship:

FAT titer	LNI
1:25	1.0 - 1.5
1:125	1.5 - 2.0

1:625	2.0 - 3.0
625	3.0

An effort will be made in future studies to correlate the time of appearance, duration of and maximum levels of Rabies antibody as determined by these two methods.

Discussion: The widely dispersed areas where proven rabies cases have occurred suggest the endemicity of rabies infection in Thailand. Unconfirmed cases have been reported in most of the provinces of northeastern and northwestern Thailand based on symptomatology of the dog rather than laboratory confirmation. Some human rabies deaths among Thai nationals occur in these provinces each year, with the total number for Thailand around 400. With the number of dogs in the provincial cities, villages and rural areas, with rabies known to be present in these areas and with still inadequate means of controlling canine rabies, this disease has to be considered to be a significant hazard to US Military, USIS, USOM, Peace Corps and State department personnel stationed in Thailand. Since rabies therapeutic measures are not 100% effective and the delay of onset of treatment after exposure affects the effectiveness of the treatment, personnel in areas remotefrom Bangkok are particularly vulnerable because communications and transportation may be slow and cumbersome resulting in delay in diagnosis of canine rabies and/or treatment of the exposed personnel.

Many of those personnel receiving treatment, because of the severity of the exposures and delay of treatment, receive massive doses of horse antirabies serum in addition to the vaccine, with a resultant 20% reaction rate; many of which require hospitalization. Both from the danger of rabies deaths and from the lost man hours due to treatment, it would seem desirable to prophylactically immunize all personnel being sent to these areas. The Peace Corps has already embarked on such a program and USIS is expected to follow shortly.

The high incidence of rabies in stray dogs from Udorn (city in Northeast Thailand of about 25,000 population) was unexpected. Yet rabies was proven to exist in the area and very few dogs were immunized against rabies infection, despite a high density of dogs in the area. In contrast to this, of 400 dogs heads obtained from the Bangkok city pound, only one was positive. During this some time, 5 suspect strays submitted directly to this laboratory for diagnosis were positive. There was this difference between the Udorn and Bangkok groups; the strays in Udorn were picked up at random and all were examined, whereas the ones in Bangkok were only a fraction of those picked up and there is good reason to believe that sick and/or ill looking dogs were not included in the study group.

Summary:

1. Nineteen (19) of thirty-six (36) animal heads submitted for rabies diagnosis were positive. There were from widely separated areas in Thailand.

2. Three of forty-four (44) stray dogs picked uo in Udorn were positive.

3. One of four hundred (400) stray dogs picked up from Bangkok municipal dog pound was positive.

4. Preliminary results on FAT serum titer indicate a good correlation with positive LNI titer.

5. Work is continuing.