

Epidemiological studies on leptospirosis in Chiang Mai (Thailand)

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SUMMARY

A total of 270 serum samples collected in Chiang Mai province were examined for antibodies against leptospira using the microscopic agglutination test (MAT). Four of 40 serum specimens from patients who visited the hospital with the common cold, were positive with a titre of 20. Twelve (10·4%) of the 115 samples in the Doi Saket district showed a positive reaction. Only 2 of 115 sera of school children in Chiang Mai city had antibodies.

Specific serovars detected were *Leptospira hebdomadis* (5), *L. australis* (3), *L. icterohaemorrhagiae* (2), *L. bataviae* (2), and one each of *L. canicola*, *L. javanica* and *L. pyrogenes*. One case of mixed infection with *L. hebdomadis* and *L. javanica*, and *L. autumnalis* and *L. australis* were observed.

INTRODUCTION

There have been few reports on leptospirosis in Thailand since the 1950s and 1960s. Sundharagiati (1967) reported a high incidence of *Leptospira bataviae* infection in the central part of Thailand. No epidemiological studies on leptospirosis in Thailand have appeared for the past 10 years.

Recently, we were able to examine serum samples from Thailand which were collected for studies on influenza antibodies at a hospital, at a school in Chiang Mai city and in Doi Saket district, 18 km east of Chiang Mai city. In this paper, we report the results of epidemiological studies on leptospirosis in Chiang Mai.

MATERIALS AND METHODS

Antigens

The following nine serovars were used as the antigens in this study, according to the report in the leptospiral serotypes distribution lists (US Department of Health, Education and Welfare, Public Health Service, 1966): *L. icterohaemorrhagiae*, *L. autumnalis*, *L. hebdomadis*, *L. australis*, *L. canicola*, *L. pyrogenes*, *L. pomona*, *L. bataviae* and *L. javanica*.

Table 1. *Results from 40 sera in Chiang Mai hospital*

Age (years)	Number of sera surveyed	Number of positive sera	Serovar specificity	Antibody titre
10-19	2 (1)*	1	<i>L. autumnalis</i>	20
20-29	16 (9)	2	<i>L. icterohaemorrhagiae</i> <i>L. canicola</i>	20 20
30-39	8 (4)	0		
40-49	5 (3)	1	<i>L. hebdomadis</i> and <i>L. javanica</i>	40 20
50-59	8 (5)	0		
60 over	1	0		
Total	40 (22)	4 (10%)		

* Figures in parentheses are number of females.

Table 2. *Results from 115 sera in Doi Saket district*

Age (years)	Number of sera surveyed	Number of positive sera	% of positive sera
10-19	2 (1)*	1	50
20-29	16 (12)	2	13
30-39	53 (37)	4	8
40-49	30 (19)	3	10
50-59	12 (8)	2	17
60-69	1	0	0
70 over	1 (1)	0	0
Total	115 (78)	12	10.4

* Figures in parentheses are number of females.

Serum specimens

A total of 270 serum samples collected in Chiang Mai province were examined. Forty specimens from patients suspected of having a common cold at Chiang Mai hospital, 115 specimens from healthy school children in Chiang Mai city and 115 from healthy persons of Doi Saket district were used.

Microscopic agglutination test (MAT)

The agglutination titres were estimated by a modification of the MAT of Schüffner and Mochtar (1927), in which the serum specimens were diluted in twofold serial dilutions with a microtitrating diluter (Galton *et al.* 1965). The reciprocal of the dilution of the specimen showing about 50% agglutination was taken as the MAT antibody titre.

RESULTS

Table 1 shows the results of 40 serum specimens obtained from patients who were suspected of having a common cold at Chiang Mai hospital. Four specimens (10%) had titres of 20-40 by MAT. One each was positive to the following serovars: *L. autumnalis*, *L. icterohaemorrhagiae* and *L. canicola*. Another one specimen reacted with *L. hebdomadis* (40) and *L. javanica* (20), suggesting a mixed infection.

Table 3. Serological findings of 12 positive sera

Serovar specificity	Antibody titre
<i>L. icterohaemorrhagiae</i>	1 20
<i>L. autumnalis</i> and <i>L. australis</i>	1 40, 20
<i>L. hebdomadis</i>	3 20
	2 40
<i>L. australis</i>	2 20
<i>L. pyrogenes</i>	1 40
<i>L. bataviae</i>	1 20
	1 40

Two only of 115 sera from school children of Chiang Mai city (6–13 years old) were positive, one each to *L. javanica* (40) and *L. australis* (20).

Table 2 shows the results of 115 serum samples from Doi Saket district. The largest number of samples were taken from adults between the ages of 30–49 years. Twelve of 115 specimens (10·4 %) showed positive reactions to the antigens shown in Table 3. Five of the 12 sera, were positive to *L. hebdomadis* of which three showed a titre of 20 and two showed a titre of 40. Two specimens showed an antibody titre of 20 to *L. australis*, and two were positive to *L. bataviae* (20–40). One was positive to *L. icterohaemorrhagiae* (20) and another to *L. pyrogenes* (40). One sample reacted to both *L. autumnalis* (40) and *L. australis* (20), suggesting mixed infection.

DISCUSSION

There has been no epidemiological study on leptospirosis in Thailand for the past 10 years. However the disease is an infectious disease commonly seen in the tropics. Sitprija *et al.* (1985) reported 126 cases of leptospirosis which were confirmed by microagglutination; *L. bataviae* was the most common infecting serogroup (103 cases of 81·7 %), *L. javanica*, *L. canicola* and *L. icterohaemorrhagiae* were less frequently seen. This suggests that many people might have leptospiral antibodies.

In this paper, we attempted to examine leptospiral antibodies in serum samples from Thai people which were originally collected for a sero-epidemiological study on influenza.

Only 2 of 115 serum samples from school children of Chiang Mai city showed evidence of leptospiral antibodies to *L. javanica* and *L. australis* at a titre of 40 and 20, respectively. This suggests that the city school children may not come in contact with the disease. Generally, very young children are considered to be at risk.

Ten percent of 40 patients suspected of suffering from the common cold had leptospiral antibodies. If sera were collected from the patients suspected of meningitis and hepatitis, more positive cases would probably have been found.

Leptospiral antibodies were detected in 12 (10·4 %) of 115 serum samples from healthy persons in Doi Saket district. These findings may suggest some evidence on the distribution of a leptospira in Thailand; more cases of leptospirosis would be found in Thailand, if laboratory examination were more extensively used. The serovars found in Thailand are similar to those in Japan. However *L. javanica* and

L. bataviae are more prevalent in Thailand. Our data agree with that of Sitprija *et al.* (1985) who observed a high incidence of *L. bataviae* infection. The results from the West Indies, reported by Everard & Green (1976) are similar to those reported here.

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