

LEPTOSPIROSIS IN MALAYSIA : A COMMON CAUSE OF SHORT-TERM FEVER

G.W. BROWN, C.K. LEE, D.L. HUXSOLL, T.S. NG*, K.J. LIM*, H.S. WAN**,
J.D. EERAN** and G. SANNASEY**

U.S. Army Medical Research Unit, Institute for Medical Research, Kuala Lumpur. **District Hospital, Kuala Pilah, Negri Sembilan. **District Hospital, Mentakab, Pahang, Malaysia.

INTRODUCTION

Leptospirosis was first described from Malaya by Fletcher (1928), who was investigating febrile patients for evidence of typhus. Of the 32 patients described, 7 had jaundice, and one died. Fletcher pointed out that, in Malaysia, the infection was most common in rural areas. This observation was confirmed by McCrumb and co-workers (1957) who studied febrile illnesses in large numbers of soldiers operating in the jungle during the Malayan Emergency. In their studies, leptospirosis was shown to be the most common cause of fever in soldiers, accounting for 34% of patients admitted, for fever, to a military hospital. A simultaneous investigation of civilian adult males admitted to an urban hospital yielded a diagnosis of leptospirosis in only 13% of cases. Jaundice was noted to be very uncommon in the military patients (3.8%) but was seen in 18.4% of the civilians. A mortality of 0.8% was recorded overall.

Fletcher (1928) noted that more than one serotype was causing clinical illness, and Alexander and co-workers (1957) characterised 110 human isolates, demonstrating over 30 differing serotypes, 20 of them from a small area of Western Pahang.

In recent years, however, leptospirosis has not been recognised as an important cause of illness in the civilian population. Tan (1970) reported an incidence of approximately 50

cases p.a. during 1958-68, and only 19 and 16 cases were notified to the Ministry of Health during 1973 and 1974 respectively (J.S. Gill, pers. comm.). In contrast, the prevalence of leptospiral antibody in the normal population of Malaysia is 12%, some 12 times that in UK or USA (Tan, 1969).

Our group has been investigating febrile patients in rural Malaysia, primarily in a study of scrub typhus (Brown *et al.*, 1976). Sera from these patients have also been examined for leptospiral antibodies, and the results form the basis for this report. These patients have, so far as possible been unselected, except for locality, and therefore differ from the previously reported series.

MATERIALS AND METHODS

Patients : Clinical and epidemiological data, and acute and convalescent specimens of venous blood were collected from unselected febrile inpatients at two district hospitals (Mentakab and Kuala Pilah), and from outpatients at a rural health centre (Bukit Mendi), in central West Malaysia (Fig. 1). Patients complaining of headaches, cough or general malaise were also included, even if not febrile at presentation. Very young children, from whom venous blood could not easily be obtained, were largely excluded from the study. Convalescent sera were collected 2 weeks after the acute specimens wherever possible, though early discharge from hospital necessitated a shorter interval in many instances. Pairs of sera collected less than 3

This work was supported by Research Grant No. DAMD17-76-G-9413 from the U.S. Army Medical Research and Development Command, Washington, D.C. 20314.

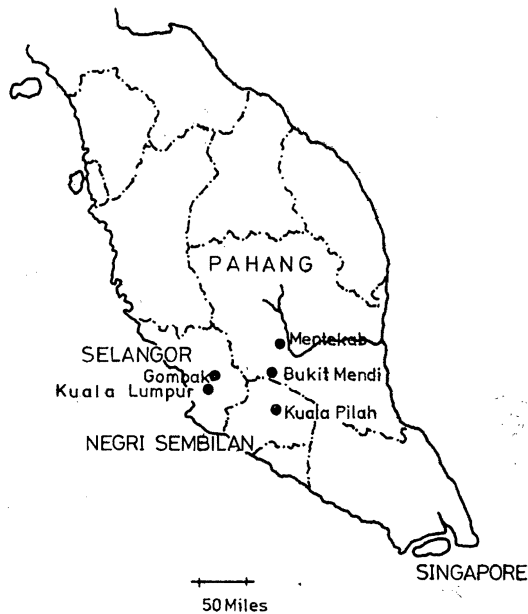


Fig. 1—Map of Peninsular Malaysia showing location of study sites.

days apart were excluded from the study, which was carried out from March 1975 to February 1976.

Bukit Mendi health centre is located on a Federal Land Development Authority (FELDA) oil-palm plantation in southern Pahang. An area of disturbed primary jungle, approximately 8×10 miles in size, has been partially cleared, burned and planted over the past nine years. Most of the plantation is now in production, and approximately 10,000 people have settled, in 4 villages, on the scheme. Adults of both sexes work in the fields, and children sometimes accompany them.

Mentakab district hospital serves an area of central Pahang containing many similar FELDA schemes, and also a large population of rural villagers. Kuala Pilah hospital, in Negri Sembilan, serves a rather different, semi-urban, population, and rubber estate and rice field workers predominate over the few oil-palm labourers.

Serology : The paired sera were examined for leptospiral antibody by the haemolytic test (Cox, 1957). *L. biflexa* antigen was supplied by the Division of Veterinary Medicine, Walter Reed Army Institute of Research, Washington, D.C. An adaptation of the technique to a microtiter system (Dynatech Corporation, 1972) was introduced towards the end of the study. The sera were kept at -20°C from the time of separation. A 4-fold or greater rise in titre to at least 1/100 between acute and convalescent specimens was regarded as diagnostic.

RESULTS

The results of the serological examinations of the sera are shown in Table 1, and an analysis of the age and sex of the leptospirosis patients is shown in Table 2. In 79 (92%) of the patients, the rise in titre was 10 fold or more, and the convalescent titre was 1/400 or greater in 63 (73%).

Headache was recorded as a feature in 42 (48.8%) of the 86 patients, but jaundice in only 2 (2.3%). Data on the clinicians' provisional diagnoses is incomplete, but it was apparent that leptospirosis was suspected in only a small number of cases.

DISCUSSION

Our study differed, in several important ways, from those previously carried out. Tan (1970) reported on specimens submitted from patients with symptoms thought to be suggestive of leptospirosis. Thus her finding that 46% of patients were jaundiced was probably a result of selection. Our figure of 2.3% is similar to that (3.8%) reported by McCrumb *et al.*, (1957). Similarly, Nelson *et al.*, (1973) in a report on 61 cases of the disease originating from the same source, in Washington state, documented a generally benign course for the disease. No patients were jaundiced,

Table 1
Leptospirosis in unselected febrile patients.

	Mentakab hospital	Kuala Pilah hospital	Bukit Mendi clinic
Leptospirosis	26 (8.2)*	41 (6.0)	19 (4.4)
Total Patients	318	688	431

* Number of patients as a percentage of the total at each location.

Table 2
Incidence of leptospirosis in febrile patients, by age and sex.

	< 5	5-14	15-24	25-34	35-44	> 44	Total
Male	0/53 (0)	23/204* (11.3)	21/241 (8.7)	18/199 (9.0)	6/97 (6.2)	2/80 (2.5)	70/874 (8.0)
Female	1/32 (3.1)	6/146 (4.1)	4/138 (2.9)	1/105 (0.95)	2/70 (2.9)	2/67 (3.0)	16/558 (2.9)

* Positive/total patients of each sex and age group, with the positives expressed as a percentage in parentheses.

and only half were admitted to hospital. The infections in Nelson's series were caused by a serovar closely related to *L. pomona*, recognised for its lack of virulence to man. Alexander *et al.*, (1975) isolated over 1000 pathogenic leptospirae from Malaysian surface waters, and demonstrated that relatively avirulent serovars were common in some habitats, including jungle streams. Thus, there may be two factors which contribute to the differences between series: selection of patients, and exposure to serovars of varying virulence.

The age and sex distribution in this series is similar to that reported by Tan (1970), and it is seen that leptospirosis is mainly a disease of young males, from school age throughout the working period.

SUMMARY

A study of 1,437 unselected febrile patients in rural Malaysia yielded a diagnosis of leptospirosis in 86 (6.0%). The clinical syndrome was mild to moderate in all cases, jaundice was observed in only 2 (2.3%) and

no deaths were documented. The diagnosis was not clinically obvious in most cases, and it is apparent that many infections must be going unnoticed at present.

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