

Leptospira interrogans and Leptospira kirschneri are the dominant Leptospira species causing human leptospirosis in Central Malaysia

ABSTRACT

Background: Leptospirosis, commonly known as rat-urine disease, is a global but endemic zoonotic disease in the tropics. Despite the historical report of leptospirosis in Malaysia, the information on human-infecting species is limited. Determining the circulating species is important to understand its epidemiology, thereby to strategize appropriate control measures through public health interventions, diagnostics, therapeutics and vaccine development. **Methodology/Principle findings:** We investigated the human-infecting *Leptospira* species in blood and serum samples collected from clinically suspected leptospirosis patients admitted to three tertiary care hospitals in Malaysia. From a total of 165 patients, 92 (56%) were confirmed cases of leptospirosis through Microscopic Agglutination Test (MAT) (n = 43; 47%), Polymerase Chain Reaction (PCR) (n = 63; 68%) or both MAT and PCR (n = 14; 15%). The infecting *Leptospira* spp., determined by partial 16S rDNA (rrs) gene sequencing revealed two pathogenic species namely *Leptospira interrogans* (n = 44, 70%) and *Leptospira kirschneri* (n = 17, 27%) and one intermediate species *Leptospira wolffii* (n = 2, 3%). Multilocus sequence typing (MLST) identified an isolate of *L. interrogans* as a novel sequence type (ST 265), suggesting that this human-infecting strain has a unique genetic profile different from similar species isolated from rodents so far. **Conclusions/Significance:** *Leptospira interrogans* and *Leptospira kirschneri* were identified as the dominant *Leptospira* species causing human leptospirosis in Central Malaysia. The existence of novel clinically important ST 265 (infecting human), that is different from rodent *L. interrogans* strains cautions reservoir(s) of these *Leptospira* lineages are yet to be identified.

Keyword: Leptospirosis; Human leptospirosis; *Leptospira* species; Malaysia