

## ABSTRACT

Sri Lanka experienced the worst ever outbreak of leptospirosis in the year 2008. Despite its accurate prediction by the Epidemiological unit of Sri Lanka, the public health system was unable to prevent and control this outbreak mainly due to lack of understanding on local disease dynamics and paucity of data to explain these dynamics. The main objective of the present study was to describe the sero-epidemiology and determinants of leptospirosis among patients admitted to selected government hospitals in three endemic districts in Sri Lanka during the 2008 outbreak of leptospirosis.

The present study was carried out in Matale, Kegalle and Kandy general hospitals from September 2008 to January 2009. All consecutive patients admitted to medical wards of selected hospitals were screened for probable cases and those who fulfilled the inclusion criteria were invited to participate in the study. Confirmation of leptospirosis was carried out using the gold standard microscopic agglutination test with a broad panel of serovars. An age and sex matched control group was selected for the case-control study from the same wards. Variables for the study were selected using a conceptual hierarch of proximal, intermediate and distal level variables. An interviewer administered questionnaire and a clinical check list was used as data collection tools. A conditional logistic regression was used to analyse determinants of leptospirosis.

Altogether 746 acute fever patients were screened to select 404 probable cases of leptospirosis; paired sera were obtained from 167 patients and 153 of them were treated as leptospirosis by treating physicians. Of the clinically suspected cases of leptospirosis, 77 (50.3%) were confirmed as having leptospirosis using gold standard test. The prevalent serogroups causing human leptospirosis in the study area were Pyrogenes (28.7%), Sejroe (18.8%), Javanica (11.5%) and Hebdomadis (11.5%). The commonest exposure event

LIBRARY

during the three weeks prior to onset of symptoms was exposure in paddy fields, with 70.3% of cases and 38.1% of controls reporting this event. Cases were significantly more likely to be part time paddy field workers (55%) rather than traditional farmers, compared to controls where only 35.8% were part time workers but the majority were full time farmers. Exposure to paddy field (OR 3.29, 95% CI 1.93-5.62) and running water (OR 2.57, 95% CI 1.40-4.73) were the main environmental exposure risk factors identified in a multivariate model. Cattle handling (OR 7.15, 95% CI 3.02-16.92), dog handling (OR 2.4, 95% CI 1.15-5.01) and frequent sighting of rats in the home yard (OR 2.56, 95% CI 1.49-4.41) were risk factors for contracting leptospirosis and frequent sighting of cats in the home yard showed a trend towards a protective effect (OR .603, 95% CI .338-1.074,  $p=0.08$ ). Dumping solid waste in their own garden (OR 2.09, 95% CI 1.34-3.27) was a risk factor, whereas using mainline water for drinking and other purposes (OR .551, 95% CI .307-.987) showed independent protective effects on leptospirosis. Farming or agriculture as an occupation was not significantly associated with leptospirosis in this study population.

This study confirmed that only half of the clinically suspected leptospirosis patients had the disease, a finding that strengthens the urgent need for laboratory diagnosis to detect concurrent outbreaks of leptospirosis and other common infectious diseases. Non-traditional paddy field workers with infrequent exposure pose a major challenge in defining a target group for primary prevention. The role of rodents and cattle as the main reservoirs of infecting *Leptospira spp.* for human disease within the study area was established and inclusion of rodent control in paddy fields and control of bovine leptospirosis are recommended as integrated approaches in leptospirosis control. Regularizing rural waste disposal procedures and improving access to safe water is essential for the future prevention of leptospirosis.