Eco-epidemiological approach in investigating human leptospirosis in Sri Lanka

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Abstract

The ecological system plays a vital role in leptospirosis transmission. Humans are accidental hosts with domestic and peri-domestic animals acting as reservoirs, while rodents are natural hosts to most *Leptospira spp*. The objective of the present study was to investigate human leptospirosis through a human case linked animal and environmental study, using an eco-epidemiological approach to provide evidence for disease prevention and control. From June 2013 to February 2014, possible cases of leptospirosis presented to major hospitals in eight districts were recruited as study participants. Serum samples of cattle, buffaloes, and dogs from the residential environment of suspected leptospirosis patients and rodent samples from pre determined ecological locations of the selected districts were obtained. Samples were tested at, WHO reference laboratory in Andaman Islands, India with a regionally optimized MAT panel with 11 serovars and in the Leptospirosis research laboratory of the Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka. Total of 788 mammal/ rodent samples linked to 266 suspected human leptospirosis cases were collected from cattle (n=460), rats (n=270), dogs (n=31) and buffaloes (n=27). Of the suspected cases, 22 (8.3%) were confirmed and 69 (25.9) were labeled as probable. More than 90% of the patients reported that the residential environment is conducive for leptospirosis transmission. Sero-prevalence of anti-leptospiral antibodies among buffalos, cattle and dogs was 67% (n=18), 32% (n=146) and 26% (n=8) respectively. Rats had a sero-positivity rate of 6% (n=17). For cattle, wide inter-district variation of seropositivity was observed with 6.7% in Colombo district to 50% in Ratnapura district. Seropositivity among rat was highest in Ratnapura district (11/95, 11.6%). Handling of dogs was the commonest animal exposure reported for a species. Handling of cattle and buffaloes too was in the range of 6 - 13% among all three categories. Using buffaloes was found to be higher among the confirmed patients (15.4%) when comparing with possible (6%) and probable (7.2%) patients. Sighting of rats in abundance too was higher among confirmed patients (38.5%) when comparing with possible (19%) and probable (15.9%) patients. This study confirms that the Leptospira infection is common among domesticated and feral animals and the eco-epidemiological approaches are requires for better disease control.

Keywords: *Eco-epidemiology, Leptospirosis, Reservoir hosts, Risk factors, Seroprevalence*

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