Leptospirosis is one of the most recognized spirochaetal zoonotic diseases and several pathogenic species can cause a wide range of clinical manifestations, from a mild, flu-like illness to a severe multi organ system failure leading to death (Evangelista and Coburn, 2010). The genus *Leptospira* consists of 20 species and includes nine pathogenic, five intermediate and six saprophytic species (Picardaeu, 2013). The majority of pathogenic serovars are found in the three species with a global distribution – *L. interrogans*, *L. borgpetersenii* and *L. kirschneri*. The other pathogenic species are *L. alexanderi*, *L. alstonii*, *L. kmetyi*, *L. noguchi*, *L. santarosai* and *L. weilii* (OIE, 2014). Leptospirosis is known to be endemic in India since the early 20th century (Barker, 1926). Most outbreaks of leptospirosis in India are reported from the coastal regions and highest rates occur during October to November which coincides with the monsoon season in these parts (Dhanze *et al.*, 2013). Human infection can occur either through direct contact with infected animals or, much more commonly through indirect contact with water or soil contaminated with infected rodent’s or animal’s urine (Faine, 1982). Person to person transmission is very rare since man is the dead end host for leptospiral dissemination ( Dutta and Christopher, 2005).

Dark field microscopical examination microscopy is useful in the early diagnosis of leptospirosis and thereby could prevent later complications like jaundice (Chandrasekaran and Pankajalakshmi, 1997). The typical motility of the leptospires in the clinical sample (blood, CSF, urine or peritoneal fluid) observed with dark-field microscopes, when correlated with clinical parameters, may aid in early diagnosis (Sambasiva *et al.*, 2003). The present perspective study was compared retrospectively to assess the prevalence and incidence of human leptospirosis and various demographic variables such as age, sex and occupation were analysed.

Serum specimens of 345 acute cases from patients of different age groups, sex and occupations were collected from various hospitals in and around Namakkal from July, 2012 to August, 2014 along with relevant epidemiological and clinical data. Clinical signs reported by the patients were fever, myalgia, arthralgia, head ache, cough, vomiting and jaundice. Data were taken from the questionnaire recorded by the physicians while they recommend for dark field microscopic examination.

The samples were subjected to dark field microscopy (DFM) as per the method described by Vamshi Krishna *et al.* (2012). A drop of serum (approx. 7.0 µl) is placed on the slide and cover slip was placed above it and examined under DFM at 100x magnification as a wet

**ABSTRACT**

The present study was carried out retrospectively to assess the risk factors and epidemiological significance of leptospirosis in humans in Namakkal region of Tamil Nadu, India. A total of 345 human sera samples referred by physicians as suspected cases of leptospirosis from Namakkal region of Tamil Nadu were screened by dark field microscopy. Prevalence of leptospirosis in human was 72.5 per cent out of 345 cases. Higher positive rates were noticed in males (70.4%). Relative risk of 1.2 for males indicates that males are at higher risk of developing leptospirosis than females. Prevalence of leptospirosis was high in patients of 21-30 years age group and occupation wise it was found high in students. Higher rates of leptospirosis were noticed during monsoon season in Namakkal region. The control of leptospirosis in humans include vaccination of animals, rodent control, good hygiene and creating public awareness by education which is of utmost importance.

**Keywords**: Leptospirosis, Human, Risk factors

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mount preparation for the presence of leptospira. Relative risk for assessing the risk factors associated with the occurrence of leptospirosis was calculated by the method described by Thrusfield (1995).

In the present study, the results revealed that prevalence of leptospirosis in humans in Namakkal area was 72.5 per cent out of 345 cases. This is in concordance with the findings of Saravanan et al. (2014) who recorded a positivity of 45.8% and 51.7%, respectively, in this region. Higher prevalence was observed in males (70.4%) than females (29.6%). The relative risk of 1.2 obtained in this study indicates that males are at higher risk of developing leptospirosis than females. This might be due to occupational or recreational exposure that put men in greater contact with leptospira infected animals or contaminated water such as sewage water. Similar findings were reported by Chaudhry et al. (2013) who reported that majority of the suspected patients were males (68%) as compared to females (32%). In this study, highest prevalence was noticed in the age groups of 21-30 years (22.8%), followed by age groups of 31-40 years (20.4%) and 11-20 years (16.4%), which is in accordance with the findings of Sethi et al. (2015) who reported highest prevalence in young adults during their 2nd, 3rd, 4th decades of life. High prevalence of leptospirosis in young adults may be probably due to their higher exposure to the risky environments for their education, occupation and other related activities. Chaudhry et al. (2013) and Deodhar and John (2011) reported that 94% and 64% of the leptospirosis patients belonged to the age group of 12-60 years and 31-50 years, respectively. Higher positive rate of leptospirosis was also observed in students (24%), followed by farmers (17.6%) and private and public sector employees (11.6%), which is in accordance with data reported by Deodhar and John (2011) who stated that leptospirosis is traditionally considered to be a disease of sewage workers, miners and farmers and now recognized as one of the common causes of acute febrile illness in the general population. Approximately 36% of Namakkal’s workforce is employed in agriculture and reported cases of leptospirosis fluctuate with rainfall and farming cycles.

In this study, 36% of the positive cases have contact with various animals including dogs, cattle, sheep and goats. Evangelista and Coburn (2010) stated that infection of humans by pathogenic strains of Leptospira commonly occurs through direct contact with infected animal urine or indirectly through contaminated water. Dhanze et al. (2013) recorded that the carrier animals for leptospirosis in India include rats, pigs, cattle, bandicoots and dogs. This may be the possible explanation for the highest positivity of leptospirosis in human who had contact with animals. Working in farm lands and contact with animals especially cattle are considered as important risk factors for the occurrence of leptospirosis (Sethi et al., 2015). The most common form of leptospirosis in man is anicteric leptospirosis, a self-limited illness that occurs in 85% to 90% of the cases (Sambasiva et al., 2003), which is in similar to the findings in the present study, where more than 85% of positive cases exhibited clinical signs of fever, head ache, myalgia, malaise, vomiting and mild cough.

High prevalence of leptospirosis (81.6%) was noticed during the monsoon season when compared to other seasons. Assessing the monsoon season as risk factor for the occurrence of leptospirosis revealed relative risk of 1.08, thereby it indicates that monsoon season has a positive influence on the occurrence of leptospirosis. Highest rates of leptospirosis occur coincides with the monsoon season in India was also reported by Dhanze et al. (2013). Leptospirosis has a peak during the monsoon and post-monsoon months, and occurs more commonly in people living in urban slums with poor sanitation and low hygienic conditions (Deodhar and John, 2011). The outbreaks in highly endemic regions are normally associated with heavy rainfall, flushing the leptospires in soil into bodies of water (Evangelista and Coburn, 2010). Climatic changes and flooding, poor levels of sanitation, and high population of maintenance hosts (e.g., rats) are important determinants of infection in endemic areas. The control of leptospirosis in humans include vaccination of animals, rodent control, good hygiene and creating public awareness by education which is of utmost importance.

Acknowledgements

The authors express their sincere thanks to the Tamil Nadu Veterinary and Animal Sciences University for providing necessary facilities for carrying out this study.

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