

Prevalence of non-vaccine strains in leptospira affected dogs in Chennai - A Retrospective study

Prabhavathy Harikrishnan*, G. Vijayakumar¹, N. Premalatha² and S. Kavitha³

Department of Clinic, Madras Veterinary College, Chennai-7.

Tamil Nadu Veterinary and Animal Sciences University, Chennai

¹ Professor and Head

² Department of Veterinary Preventive Medicine, MVC, Chennai -7

³ Department of Veterinary Clinical Medicine, MVC, Chennai -7.

Abstract

The present study was aimed to report the positive prevalence of *Leptospira* strains in and around Chennai. The dogs presented to Madras Veterinary College Teaching Hospital from January 2023 to December 2023 were included for this retrospective study. Overall positive prevalence of canine leptospirosis was 41.17 per cent (42/102) based on microscopic agglutination test (MAT). Canine leptospirosis was found to be higher in the age group of 1 year to 5 years. Positive prevalence was higher in male dogs than female in canine leptospirosis. Leptospirosis strains included in vaccine are Canicola, Pomona, Icterohaemorrhagiae and Grippotyphosa. The unvaccinated strains including Autumnalis, Australis, ballum were highly prevalent among dogs and less prevalent strains were Pyrogenes, Javonica and Hebdomadis.

Keywords: leptospirosis, Positive prevalence, zoonotic disease, MAT

Leptospirosis is a zoonotic disease caused by pathogenic genus *Leptospira* (Schuller *et al.*, 2015). It is a zoonotic disease and cause globally veterinary and public health problem. *Leptospira* consist of 66 species and includes more than 300 serovars (Schuller *et al.*, 2015). Common serovars affecting dogs includes canicola, icterohaemorrhagiae, Pomona, Grippotyphosa, Bratislava and Australis (Koteeswaran, 2006). Dogs acts as a Sentinel species for the environmental risk to human, hence monitoring Leptospirosis in dogs play the crucial rule to protect the risk of Leptospirosis in human (Koizumi *et al.*, 2013). The purpose of this study was to provide details need to update the vaccine strains to reduce the infection of leptospirosis among the dog population.

Dogs presented to the Madras veterinary College teaching Hospital, Chennai suspected with the clinical symptoms of vomition, fever, oliguria, echhymotic patches with icteric mucous membrane and elevated creatinine level during the period from January 2023 to December 2023 were subjected to retrospective study. The collected data included details of breed, age, sex, vaccination history, haematology, serum biochemistry and MAT results.

Positive prevalence was higher in male dogs than female in canine leptospirosis. Canine leptospirosis was found to be higher in the age group of 1 year to 5 years.

Table 1: Sex-wise Positive prevalence of Leptospirosis

Sex	Positive	Positive prevalence (Per centage)
Female	15	35.71
Male	27	64.28

*Corresponding author : drprabhavet2003@gmail.com

Table 2: Age-wise Positive Prevalence of Leptospirosis

Age	Positive	Positive prevalence (Per centage)
0-1 yr	18	42.85
1-5yrs	21	50
>5yrs	3	7.14
Total	42	

Table 3: Positive prevalence of Leptospira serovar

S.No	Strains	Total no. of positive	Positive prevalence (Per centage)
1	Autumnalis	12	28.57
2	Australis	23	54.76
3	Ballum	10	23.80
4	Pyrogenes	3	7.1
5	Tarssavi	2	4.7
6	Javanica	2	4.7
7	Hebdomadis	2	4.7

Overall positive prevalence of canine leptospirosis was 41.17 per cent (42/102) based on microscopic agglutination test (MAT). Among 42 positive dogs, the prevalence of Australis, Autumnalis, Ballum and Pyrogenes were 23 (54.76 %), 12 (28.57%), 10 (23.80%) and 3 (7.1 %) respectively. While the prevalence of Tarssovi, Javanica and Hebdomadis were 2 (4.7%) each.

Microscopic agglutination test is the gold standard test for the diagnosis of Leptospirosis. MAT is serovar-specific and a titre of 1:100 and above is considered as positive (OIE, 2004). In this study overall Positive performance of canine Leptospirosis in and around Chennai was 41.17 per cent based on microscopic agglutination test this report was in compared with results of seroprevalence of 36 percent among dogs reported by Senthilkumar *et al.* (2023). Canine leptospirosis positive prevalence was found to be higher in the age group of 1year to 5years (50 per cent) and greater risks in middle-aged and older dogs (Arent *et al.*, 2013, Senthilkumar *et al.*, 2023). It is due to regular vaccination of puppies, irregular vaccination for adult dogs, senility, poor immune response and in urban areas during rainy season dogs were exposed to stagnant water found to be risk factor (Senthilkumar *et al.*, 2023).

Male dogs had higher positive prevalence when compared to female. Similar findings were noticed in the studies of Prabhavathy and Cecilia (2018) and might be due to fact that male dogs were more likely to roam and exposed to infection. Balakrishnan *et al.* (2008), Ambily *et al.* (2013) reported that serovars Australis and Autumnalis were found to be more predominant. Dogs acts as a maintenance host for serovar Canicola and Incidental host for other serovars and dogs acts as link between the reservoir of infection in the environment and human being.

Conclusion

Based on the retrospective study, it was found that Australis and Autumnalis was the predominant serovars in dogs while serovars like Ballum, Pyrogenes, Tarssovi, Javanica and Hebdomadis was the emerging strains. However, the commercial vaccine contains Canicola, icterohaemorrhagiae, Pomona and Grippotyphosa. Hence inclusion of new strains in the vaccine may prevent the infection between dogs and human being.

Acknowledgement

This work is supported by Tamil Nadu Veterinary and Animal Sciences University, Chennai, India. The authors are thankful to the Director, Directorate of

Clinics, TANUVAS, Chennai and the Dean, Madras Veterinary College, TANUVAS, Chennai for providing data and information details.

References

- Ambily R., Mini M., Joseph S., Krishna S.V., Abhinai G. 2013. Canine leptospirosis—A seroprevalence study from Kerala, India. *Vet. World.*, **6**:42–44.
- Arent, Z.J., Andrews, S., Adamama-moraitou, K., Gilmore, C., Pardali, D., Ellis, W.A. 2013. Emergence of novel *Leptospira* serovars: A need for adjusting vaccination policies for dogs. *Epidemiology and Infection*, **141**: 1148–1153.
- Balakrishnan, G., Govindarajan, R., Meenambigai, T. V., Jayakumar, V. and Manohar, M. B. 2008. Seroprevalence of animal leptospirosis in certain parts of Tamil Nadu. *Indian Vet. J.*, **85**: 227– 228
- Delaude, A., Rodriguez-Campos, S., Dreyfus, A., Counotte, M.J. and Francey, T. 2017. Canine leptospirosis in Switzerland- A prospective cross-sectional study examining seroprevalence, risk factors and urinary shedding of pathogenic leptospires. *Prevent Vet Med.*, **141**: 48-60, doi: 10.1016/j.prevetmed.2017.04.008
- Koteeswaran, A. (2006). Seroprevalence of leptospirosis in man and animals in Tamilnadu. *Indian J. Med. Microbiol.*, **24**:329-331.
- Koizumi, N., Muto, M.M., Akachi, S., Okano, S., Yamamoto, S. 2013. Molecular and serological investigation of *Leptospira* and leptospirosis in dogs in Japan. *J Med Microbiol.*, **62**(4): 630-636, doi: 10.1099/jmm.0.050039-0.
- Office Internationale des Epizootis. 2004. Leptospirosis. In Manual of Diagnostic Tests and Vaccines for Terrestrial Animals. Volume 1. 5th edition. OIE Biological Standards Commission, Paris, France; 2004:316-27
- Prabhavathy, H. and Cecilia Joseph. 2018. A Study on Prevalence of Canine Leptospirosis in Chennai. *Intas Polivet*, **19 (II)**: 393-394.
- Schuller, S., Francey, T., Hartmann, K., Hugonnard, M., Kohn, B., Nally, J.E. and Sykes, J. 2015. European consensus statement on leptospirosis in dogs and cats. *J. Small Anim. Pract.*, **6**:159–179. doi: 10.1111/jsap.12328.
- Senthilkumar, K., Tirumurugaan, K.G. and Ravikumar, G. 2023. Understanding the seroepidemiology of canine leptospirosis in Tamil Nadu: need for inclusion of additional serovars in dog vaccines. *Int J Bio-Resource Stress Manag*, **14**(1): 75-82, doi: 10.23910/1.2023.3341.