SEROPREVALENCE OF LEPTOSPIROSIS IN DOGS IN WAYANAD

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Abstract

Apioneer study was conducted to detect the presence of antibodies against Leptospiraserovars in sera of dogs in Wayanad district of Kerala employing the Microscopic Agglutination Test (MAT). Antibodies against the Spirochaete were detected in 12 out of 34 sera tested (35.29 %). It was also observed that Pyrogenes is the most prevalent serovar indogs inWayanad.

Keywords: *Leptospirosis, MAT, Seroprevalence*

Leptospirosis is a globally important anthropozoonosis caused by pathogenic *Spirochaete* of genus *Leptospira*. Numerous mammalian species act as maintenance hosts (natural carriers) including feral, farm and pet animals (Faine*et al.,*1999; Levett, 2001) and humans act as incidental hosts (Ko*et al.,* 2009) for this disease. In developing countries including India, leptospirosis can be considered as one of the emerging public health problems which causes morbidity and mortality in domestic animals as well as human beings.

Leptospirosis is endemic in Wayanad district of Kerala as it has conditions congenial for the survival of the causative agent. There is heavy rainfall, water holding soil, sharing of natural water resources by man and animals, and large number of rodents and stray dogs. Though many studies have identified the prevalent *Leptospira* serovars in many districts in Kerala, no study has been carried out in this aspect in Wayanad. The present study was carried out to identify the prevalence of various *Leptospira* serovars in dogs in Wayanad district employing the Microscopic Agglutination Test (MAT).

Materials and Methods

A total of 34 dog sera were tested in this study. Samples included those collected from leptospirosis suspected cases presented at Teaching Veterinary Clinical Complex, those submitted to the Department of Veterinary Microbiology, College of Veterinary and Animal Sciences, Pookode for diagnosis of leptospirosis and random samples collected from different

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areas of Wayanad. Twelve reference serovars namely,*Leptospira interrogans* serovar Australis, Autumnalis, Bataviae, Canicola, Grippotyphosa, Hebdomadis, Icterohaemorrhagiae, Javanica, Pomona, Pyrogenes, Sejroe and Leptospira *bergpetersenii* serovar Tarassovi were used as antigens for conducting MAT. These serovars were obtained from the Department of Veterinary Microbiology, College of Veterinary and Animal Sciences, Mannuthy, Kerala and were maintained by routine subculturing in liquid leptospira culture medium (Leptospira medium base EMJH, Difco) with supplement (Leptospira enrichment EMJH, Difco). All the serum samples were subjected to MAT as per previously reported procedure (Faine, 1982). Briefly, 1:100 dilution of the sera were prepared and the diluted sera (50µl) were mixed with each of the reference serovars (50 µl) in 96 well U-bottom microtitre plates and kept for incubation for two to three hours at 37 ºC. Negative controls were set for each test. After incubation, the mixtures were examined by dark field microscopy for agglutination of leptospires. Serum samples which has shown 50 per cent agglutination in titres equal to or more than 1:100 were considered as positive (Vijayachari *et al*., 2001).

Results and Discussion

Out of the 34 samples tested, 12 (35.29 %) were found to be positive for leptospira antibodies. The serovars against which antibodies were detected were Pyrogenes, Grippotyphosa, Bataviae, Canicola, Javanica, Pomonaand Australis. The predominant serovarwas Pyrogenes (6 samples) followed by Grippotyphosa (5 samples), Bataviae (3 samples), Canicola (2 samples), Javanica (2samples), Pomona (1 sample) and Australis (1 sample) (Table 1). Four samples (11.76%) had antibodies against a single serovar whereas antibodies against two serovars were detected in eight animals (23.52 %) (Table 2).

A study conducted in Thrissur district of Kerala in 2009 - 2010, detected Australis as the predominant servovar followed by Pomona, Grippotyphosa, Icterohaemorrhagiae, Autumnalis, Pyrogenes, Canicola, Javanica and Patoc. Mixed infections with Canicola andPyrogenes,Australis and Icterohaemorrhagiae, Australis and Javanica, Grippotyphosa, Icterohaemorrhagiae and Pomona, Australis and Pomona, and Icterohaemorrhagiae and Pomona were also detected (Abhinay*et al*., 2012). In a separate study conducted by Ambily *et al*. (2013) in the districts of Thrissur, Palakkad and Kozhikode, the most predominant serovar found was Autumnalis followed by Australis, Pomona, Grippotyphosa, Canicola, Pyrogenes, Icterohaemorrhagiae, Javanica, and Patoc. Mixed infection with Icterohaemorrhagiae and Autumnalis, Grippotyphosa and

Table 1. Result of testing dog sera for antibodies against *Leptospira* serovars by MAT

Serovar	Number of samples showing titre in MAT (1:100 or more)	Percentage of samples positive
Pyrogenes	6	17.65
Grippotyphosa	5	14.71
Bataviae	3	8.82
Canicola	2	5.88
Javanica	2	5.88
Pomona	1	2.94
Australis	1	2.94
Icterohaemorrhagiae	0	0.00
Autumnalis	0	0.00
Hebdomadis	0	0.00
Sejroe	0	0.00
Tarassovi	0	0.00

Table 2. Serovar combinations detected by MAT in dog sera

Serovar	Number of samples showing titre in MAT (1:100 or more)
Canicola and Grippotyphosa	2
Bataviae and Pyrogenes	3
Pyrogenes and Javanica	1
Pyrogenes and Australis	1
Grippotyphosa and Javanica	1

Icterohaemorrhagiae, Canicola and Icterohaemorrhagiae, Javanica and Pyrogenes, and Canicola, Icterohaemorrhagiae and Pomona were detected. Another study conducted by Soman *et al.* (2014), in northern and central Kerala, revealed that the most predominant *Leptospira* serovar in canine sera was Pomona followed by Australis, Canicola and Grippotyphosa. Mixed infections were also found out which included Canicola and Australis (1 sample), and Grippotyphosa, Australis and Pomona (1 sample).

In the present study, though the serovars Australis, Autumnalis and Pomona that were reported to be the predominant serovars in different regions of Kerala, it was observed that in Wayanad the widely occurring serovar is Pyrogenes. It is also observed that serovars involved in mixed infections observed in Wayanad are different from those previously reported in Kerala. This study gives the first insight into the serovars causing leptospirosis in canines in Wayanad. More studies have to be conducted to know the infecting serovar in other animal species especially bovines.

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