

Occurrence of Canine Ehrlichiosis in Andhra Pradesh

L. Narayana Rao^{1*}, B. Shobhamani², V. Vaikunta Rao³ and K.V. Subramanyam⁴

¹Assistant Professor, Deptt. of Veterinary Clinical Complex (Veterinary Medicine), NTR CVSc, Gannavaram-521 102

²Professor, Department of Veterinary Medicine, CVSc, Tirupati-517 502

³Professor & Head, Department of Veterinary Medicine, Clinical Complex, CVSc, Tirupati-517 502

⁴Professor & Head, Department of Veterinary Microbiology CVSc, Proddatur-516 360

¹MVSc Student, ²Professor, ³Professor & Head, Department of Veterinary Medicine, NTR CVSc, Gannavaram-521 102

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ABSTRACT

A retrospective study was conducted to investigate the hospital based occurrence of canine ehrlichiosis. A total of 750 dogs presented to the Veterinary Clinics of Gannavaram and Vijayawada were screened for canine ehrlichiosis. On clinical examination, it was found 126 dogs were infested with ticks and 50 dogs exhibited clinical signs suggestive of ehrlichiosis. Using different diagnostic methods, 6%, 18%, 30% and 34% dogs were found positive for *Ehrlichia canis* by peripheral blood, buffy coat smear examination, rapid antibody detection kit and nested polymerase chain reaction (PCR), respectively. The breed-wise occurrence was highest in Belgian Shepherd (50%) and lowest in Spitz/Pomeranian (20%), whereas, age-wise occurrence was the highest (66.66%) in 1-2 years, followed by 25% to 36.66% in other age groups. The occurrence was 38% and 26.31% in male and female dogs, respectively.

Key words: Canine ehrlichiosis, *Ehrlichia canis*, occurrence

INTRODUCTION

Canine ehrlichiosis, a tick borne disease, is caused by *Ehrlichia canis*, an obligate intracellular rickettsia of genera *Ehrlichia*, family Anaplasmataceae and order Rickettsiales (Price and Sayer, 1983). The disease is regarded as an emerging pathogen. *E. canis* is transmitted by brown dog tick *Rhipicephalus sanguineus* (Rotondano *et al.*, 2015). Canine ehrlichiosis is characterized by fever, anorexia, weakness, epistaxis, lymphadenopathy, anemia and ocular changes. The disease is diagnosed by clinical signs, hematologic abnormalities, demonstration of morulae in peripheral monocytes, and detection of serum antibodies to *E. canis* by the indirect immunofluorescence antibody (IFA) test (Waner, 2000). Molecular techniques like polymerase chain reaction (PCR) serve as a sensitive and specific diagnostic tool. It is highly reproducible and also aids in fast interpretation of the disease. An early diagnosis of the disease is imperative to ensure successful treatment and good prognosis. Canine ehrlichiosis is considered as an emerging rickettsial disease in dogs. The objective of present study was to investigate the hospital based occurrence of canine ehrlichiosis Gannavaram and Vijayawada.

MATERIALS AND METHODS

The present study was carried out at Veterinary

Clinical Complex, NTR College of Veterinary Science, Gannavaram and NTR Super Specialty Veterinary Hospital, Vijayawada from January, 2018 to October, 2018. A total of 750 dogs were examined clinically and age, breed, gender were also recorded during the study period. On clinical examination, 126 dogs were found infestation of ticks. Fifty (50) dogs showed the signs suggestive ehrlichiosis and were screened by different diagnostic methods. Whole blood samples were collected in vials with ethylene diamine tetraacetic acid from suspected dogs. Thin peripheral blood and buffy coat smears were made from whole blood for direct microscopic examination using Giemsa stain. Rapid diagnosis was carried out by using Anigen Rapid *E. canis* Ab test kit (BIONOTE, republic of Korea) as per the manufacturer's instruction. The deoxyribonucleic acid (DNA) was extracted from the blood samples by using QI Aamp (QIAGEN) DNA isolation kit. Nested polymerase chain reaction (PCR) was performed using 25 µL PCR reaction mixtures in two rounds. In first round, genus specific primers [ECC (5' - AGA ACG AAC GCT GGC GGC AAG C-3') and ECB (5'-CGT ATT ACC GCG GCT GCT GGC A-3')] were used and species specific primers [ECAN5 (5' CAA TTA TTT ATA GCC TCT GGC TAT AGG A- 3') and HE3(5' TAT AGG TAC CGT CAT TAT CTT CCC TAT-3')] were used in second round of PCR.

RESULTS AND DISCUSSION

In the present study, 6% (3/50), 18% (9/50), 30% (15/50) and 34% (17/50) dogs were found positive for *Ehrlichia canis* by peripheral blood, buffy coat smear examination, rapid antibody detection kit and nested polymerase chain reaction (PCR), respectively. In the current study, 47.05% were found positive for *E. canis* from 17 suspected dogs from Guntur district, whereas, 30.0%, 27.7% and 25.0% dogs were positive for *E. canis* from 10, 18 and 4 suspected samples from Vijayawada (Kennels), Krishna district and Kakinada, respectively. Lakshmanan *et al.* (2006) found 50% and 19.38% prevalence of *E. canis* by PCR and blood smear examination, respectively. The serological prevalence of *E. canis* in dogs was reported to 68.6% and 80% in Chennai and north India, respectively (Tresamol *et al.*, 1994; Singla *et al.* (2011). Rani *et al.* (2011) reported 20.6% of prevalence of *E. canis* in dogs by molecular diagnostic technique in north India.

Breed wise occurrence showed maximum positivity in Pugs (50%) and Belgian Shepherd (50%), followed Rottweiler (33.33%), Dachshund (33.33%), Labrador Retriever (27.27%), mongrel (25.00%) and Pomeranian Spitz (20%) breeds. In the present study, purebreds were more affected as compared to mongrel and the finding in accordance



Fig. 1: Breed wise incidence of canine ehrlichiosis

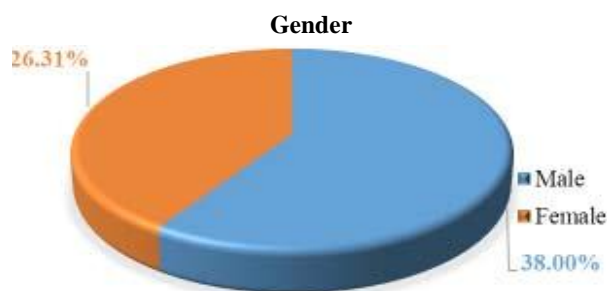


Fig. 2: Gender wise incidence of canine ehrlichiosis

with earlier study (Dhankar *et al.*, 2011). Similarly, Lakshmanan *et al.* (2006) recorded more positivity of *E. canis* in German shepherd and Labrador breeds. The variation in the occurrence of ehrlichiosis in different breeds of dogs might be due to the variation

Table 1: Occurrence of canine ehrlichiosis in Andhra Pradesh

Category	Classification	Number suspected	Number suspected positive	Percentage
Area	Guntur district	17	8	47.05%
	Vijayawada (Kennel club)	10	3	30.00%
	Krishna district	18	5	27.70%
	Kakinada	4	1	25.00%
	Rajahmundry	3	0	0.00%
	Eluru	3	0	0.00%
	Breed	Pug	8	4
Belgian Shepherd		2	1	50.00%
German Shepherd		8	3	37.50%
Rottweiler		9	3	33.33%
Dachshund		3	1	33.33%
Labrador Retriever		11	3	27.27%
Non-descript/Mongrel		4	1	25.00%
Spitz/Pomeranian		5	1	20.00%
Age	Less than 1 year	8	2	25.00%
	1-2 year	6	4	66.66%
	2-3 year	6	2	33.33%
	3-4 year	11	4	36.36%
	4-5 year	12	3	25.00%
	More than 6 years	7	2	28.00%
Gender	Male	31	12	38.00%
	Female	19	5	26.31%
	Total	50	17	34.00%

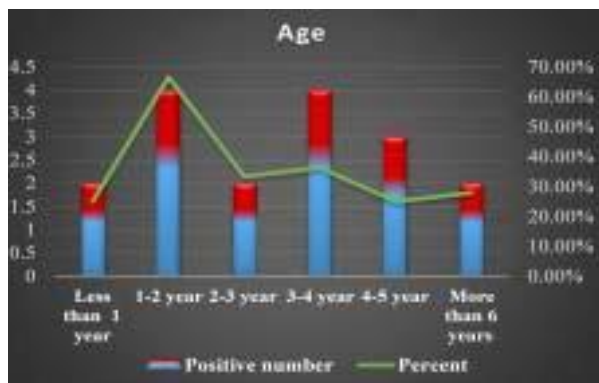


Fig. 3: Age wise incidence of canine ehrlichiosis



Fig. 4: Area wise incidence of canine ehrlichiosis

in the population size of different breeds in and around the study area. Age wise occurrence showed maximum positivity in 1-2 years (66.66%) age group, followed by 3-4 years (36.36%), 2-3 years (33.33%), <6 years (28%) and 1 year and 4-5 years (25%) age groups of dogs. Similar finding is also recorded in earlier study where the rate of incidence of *E. canis* infection was ranged between 25-36 percent in different age groups of dogs (Harrus *et al.* 1996). In the present study, the more occurrence of canine ehrlichiosis in male (38%) than female dogs (26.31%) could be due to preference of keeping male dogs by owners or visit of more male dogs to the clinics as compare to females during the study period. In earlier studies, Harrus *et al.* (1997) observed high incidence rate of canine ehrlichiosis in male dogs whereas, Bhadesiya *et al.* (2015) documented higher rate of prevalence in female dogs. However, no predilection for age, gender and breed on canine ehrlichiosis was reported by previous authors (Tresmol *et al.*, 1994; Harrus *et al.*, 1996).

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