A SURVEY OF CANINE BABESIOSIS IN AND AROUND LUDHIANA DISTRICT, PUNJAB

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Babesiosis caused by *Babesia canis* and *B. gibsoni* is a tick borne protozoal parasite prevalent in the canines worldwide. In the current study, a total of 532 blood samples, were collected and examined from canines with a history of persistent high fever presented at Small Animal Clinics, GADVASU, Ludhiana, (Punjab) during a period of one year (January, 2011 to December, 2011). Examination of Giemsa stained peripheral blood smears revealed that 5.82% (31/532) of canines were positive for canine babesiosis comprising of *B. gibsoni* (5.45%) and *B. canis* infections (0.37%). A comparable prevalence of *B. gibsoni* was recorded in all age groups but, *B. canis* was recorded only from the dogs above 1 year of age. Also, the prevalence of canine babesiosis was comparatively higher in females (6.22%) as compared to males (5.57%).

Key words: Canine, *Babesia canis*, *Babesia gibsoni*, Punjab

Introduction

B*abesia* species are tick-transmitted apicomplexan parasites that infect a wide range of vertebrate hosts and cause severe diseases in wild and domestic animals. The identification of individual species has traditionally been based on the host specificity and on the morphology of the intra-erythrocytic forms (piroplasms). *Babesia canis* (large 3.0–5.0 µm) and *B. gibsoni* (small 1.5–2.5 µm) are recognized as the two species that cause canine babesiosis worldwide and are transmitted by *Dermacentor reticulatus* in Europe, *Rhipicephalus sanguineus* in tropical and subtropical regions and *Haemaphysalis leachi* in South Africa (Uilenberg, 2006). *B. canis* usually occurs as a single pear-shaped piroplasm or in pairs of merozoites divided by binary fission within the erythrocyte.

Cases of canine babesiosis may present with a wide variation of severity of clinical signs, ranging from a hyperacute, shock associated, hemolytic crisis to an inapparent, sub-clinical infection. Dogs presented with the acute form of babesiosis, are characterized by clinical findings such as pyrexia, weakness, pallor mucous membrane, depression, lymphadenopathy, splenomegaly and general malaise. Lethargy is the most common symptom, followed by anorexia, pale mucous membranes, vomiting, amber to brown urine, splenomegaly, jaundice, weight loss, tachycardia and tachypnea.

Canine babesiosis is considered to be amongst one of the most widespread canine vector-borne disease (CVBD) causing pathogens because of its close association with the tick *R. sanguineus* and the cosmopolitan distribution of this tick species. Though large surveys on canine babesiosis are scanty, a number of reports suggest that the parasite infects dogs worldwide. In India, a variable prevalence of canine babesiosis has been reported viz. 0.66% to 8.9% in referral canines in Uttar Pradesh (Chaudhuri, 2006); 21.7% in Assam (Chandhuri and Varshney, 2007), 5.4% in Hissar, Haryana (Bansal *et al*., 1985), and 3.17% of *B. gibsoni* and 1.26% *B. canis* in Punjab (Eljadar, 2010). Direct microscopic examination is the conventional method for detecting *Babesia* spp. in animal blood samples. This is a conclusive, feasible and low cost diagnostic method (Caccio *et al*., 2002). The present study was undertaken to determine the prevalence of canine babesiosis by microscopy in and around Ludhiana (Punjab).

Materials and methods

A total of 532 blood samples, were collected and examined from canines presented at Small Animal Clinics, GADVASU, Ludhiana, (Punjab) during various months (February, May, July, August, October and November) of the year 2011. Blood samples from dogs presented with a history of persistent high fever and suspected for haemoprotozoan diseases, were collected aseptically from cephalic vein in vials containing anticoagulant (EDTA). To make a thin blood film, a drop of blood was placed on a clean glass slide, air-dried, fixed in methanol, stained with Giemsa (Coles, 1986) and examined under light microscope by using the oil immersion objective.

Results and discussion

Examination of Giemsa stained peripheral blood smears revealed that 5.82% (31/532) of canines were positive for canine babesiosis (Table 1). In recent past comparable prevalence of canine babesiosis has been reported by several workers (Eljadar 2010; Singh *et al*. 2011a, b; Singh *et al*., 2012) from the same region of Punjab state. The lower prevalence of babesiosis in dogs recorded in the present study and recent past can be attributed to the fact that there has been a substantial improvement in the managemental practices involved in canine keeping. This has decreased the exposure probability of canines to the vector tick thus leading to a decrease in the cases of canine babesiosis in the region. Further, a much higher prevalence of *B. gibsoni* (5.45%) was recorded as compared to *B. canis* infection (0.37%) from the region and the results are in harmony with previous reports (Eljadar 2010; Singh *et al*. 2011a; Singh *et al*., 2012). Although it is known that infection with either of these pathogens can result in severe and fatal disease, they can remain clinically undetectable in chronically infected dogs due to very low and often intermittent parasitaemias. Infection may not be apparent or diagnosed until such animals are immuno-compromised by unrelated disease or following splenectomy (Homer *et al*., 2000).

Table 1: Prevalence of canine babesiosis in and around Ludhiana

Parameter		**No. examined**	**Positive for *B. gibsoni* (%)**	**Positive for *B. canis* (%)**	**Total (%)**
Sex	Male	323	17 (5.26)	1 (0.31)	18 (5.57)
	Female	209	12 (5.74)	1 (0.47)	13 (6.22)
Age	<1 year	98	6 (6.12)	0	6 (6.12)
	>1 year	434	23 (5.29)	2 (0.46)	25 (5.76)
Total		**532**	**29 (5.45)**	**2 (0.37)**	**31 (5.82)**

In a large study conducted in Chennai, *B. gibsoni* was reported with a prevalence of 0.1% in client-owned dogs using bloods smear evaluation (Sundar *et al*., 2004). Other studies report 8.9% and 221.7% of dogs in Uttar Pradesh (Chaudhuri, 2006) and Assam (Chaudhuri and Varshney, 2007), respectively, infected with *Babesia*, but the species of piroplasm infecting these dogs was not reported. The pathogenicity of *Babesia* is believed to vary in different regions of India and this is likely due to host factors and/or differences in the species present.

With reference to the age of the host, the results of the current study indicated a comparable prevalence of *B. gibsoni* in all age groups but, *B. canis* was recorded only from the dogs above 1 year of age and the results are similar to earlier reports (Singh *et al*., 2012). The prevalence of the babesiosis was comparatively higher in females (6.22%) than male dogs (5.57%) which may be correlated to a smaller sample size collected during one year period.

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