EPIDEMIOLOGICAL STUDIES ON CANINE BABESIOSIS

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Canine babesiosis is increasing in incidence and prevalence and is now a major problem in dogs. During this study, a total of 250 dogs were screened for babesiosis using blood smear examination over one year period from September 2014 to August, 2015 in West Bengal and 32.80% were found positive. The dogs were grouped on the basis of their age, sex and breed and season of the year. The female dogs were more prone to disease than male dogs (60.98 vs. 39.02%), whereas the incidence of disease was higher in 13 to 36 months (14.8%) than older age groups. Crossbreds were more prone to the infection (10.0%) than purebreds. Warm and humid season played a key role in the spread of disease. Predominant vector of the disease was found to be *Rhipicephalus* species.
Keywords: Babesia, Dog, Epidemiology.

Babesia species are tick-transmitted apicomplexan parasites infesting a wide range of wild and domestic animal hosts. Canine Babesia are morphologically classified into large and small forms. *Babesia canis* (large) (4–5 µm), *Babesia gibsoni* (small) (1–2.5 µm) (Schoeman and Leisewitz., (2006). Differences in geographical distribution, vector specificity and antigenic properties subdivided the former species into three subspecies, namely *Babesia canis* transmitted by *Dermacentor reticulatus* in Europe, *B. canis vogeli* transmitted by *Rhipicephalus sanguine* in tropical and subtropical regions and *B. canis rossi* transmitted by *Haemaphysalis leachi* in South Africa. *B. gibsoni* occurs in Asia, North America, Northern and Eastern Africa, Australia and Europe (Birkenheuer *et al*., 1999; Muhlnickel *et al*., 2002; Criado-Fornelio *et al*., 2003). The purpose of the present study was to find out the disease pattern of canine babesiosis in relation to various parameters (age, sex, and breed of the dogs and season of the year) for future prophylaxis.

Materials and Methods

Data of epidemiological survey and vector identification studies undertaken through September 2014 to August 2015 at the Department of Veterinary Parasitology was analysed in our study, at department of Medicine, West Bengal University of Animal and Fishery Sciences, Kolkata, W.B. A total of 250 dogs showing signs of babesiosis such as pale mucus membrane, depression, pyrexia, anorexia, weight loss etc. were included in the study. Pertinent signalment (breed, age, sex of the patient) and history from each individual dog was collected. During clinical examination, the presence of ticks detected on the coat of the dog was also incorporated. Metrological data for the study period was also obtained. Occurrence of the disease was studied in relation to age, breed, sex and season.

Statistical Package for Social File, SPSF-21 version and Microsoft Office Excel 2007 were used for data analysis**.**

Results

Epidemiological study:

A total of 250 numbers of dogs in and around, Kolkata were screened during September 2014 to August 2015 for Babesiosis and out of them 82 animals (32.80%) were found clinically and cytologically positive. Out of 82 positive samples 78 animals were found infected with *Babesia gibsoni* (small) (1–2.5 µm) and 4 animals with *Babesia canis* (large) (4–5 µm) respectively. As per records blood smears were stained by the standard Giemsa staining method then examined under oil immersion for the presence of intra-erythrocytic protozoa like *Babesia gibsoni, B.canis*.

Part of M.V.Sc. Thesis

Statistical analysis of the data (Table-1, 2, 3 and 4) revealed that occurrence of Babesiosis was highest among dogs, 13 to 36 months of age (14.80%) followed by 37 to72 months (8.80%). Occurrence was more in female dogs (60.98%) than in male dogs (39.02%). The highest percentage of the disease positive cases was found in Crossbreds, whereas lowest percentage was found in Doberman. The disease was more prevalent during the months of June, July, August, September compared to rest of the period.

Table 1: Occurrence of canine babesiosis in relation to various age groups

Age	No. of dogs screened	No. of positive cases	Overall percentage
Up to 12 months	78	16	6.40
13 to 36 months	95	37	14.8
37 to 72 months	55	22	8.80
Above 72 months	22	07	2.80

Table 2: Occurrence of canine babesiosis in relation to sex

Sex	No of positive cases	Percentage
Male	32	39.02
Female	50	60.98
Sex ratio (M:F)	1:1.56	

Table 3: Occurrence of canine babesiosis in relation to breeds

Breed	No. of dogs	Positive	Percentage
Labrador	43	24	9.60
Spitz	33	08	3.20
German Shepherd	23	07	2.80
Doberman	33	04	1.60
Cocker Spaniel	27	05	2.00
Pug	33	09	3.60
Crossbred (non-descript)	58	25	10.0

Table 4: Showing month wise incidence of canine Babesiosis

Month	No of samples Examined	Positive samples	Percentage positive
September 2014	23	10	4.00
October 2014	14	08	3.20
November 2014	14	05	2.00
December 2014	21	02	0.80
January 2015	11	00	0.00
February 2015	16	00	0.00
March 2015	21	04	1.60
April 2015	20	06	2.40
May 2015	23	09	3.60
June 2015	27	11	4.40
July 2015	31	13	5.20
August 2015	29	14	5.60
Total	**250**	**82**	**32.80**

Discussion

Babesiosis can infect dogs of all ages, although most infected dogs are less than three years old. On the other hand, the older dogs were also prone to babesia infection. Older animals are predisposed for babesial complications. In the present study the age of dogs with babesiosis varied from 12 months to > 72 months age indicating no specific susceptible age group agreeing with the reports of Varshney *et al.* (2003). However, dogs in the age group 13 to 36 months (14.8 %) showed higher prevalence followed by dog of 37 to 72 months (8.80 %) and up to up to 12 months (6.40 %) least in the age above 72 months (2.80 %). The present study indicated that female dogs were more prone to babesiosis than male dogs. Bitches were mostly affected due to their hormonal status that may lead to higher level of infection as also reported by Mellanby *et al*. (2011). However, some other studies as by Martinod *et al*. (1986) showed that the sex ratio was the same in the sick and in the total population of dogs, there was no difference in susceptibility to *B. canis* between males and females.

Higher incidence of babesiosis in the present study was observed during the months of July and August, as also reported by other authors like Jacobson (2006) that Babesiosis occurred with the highest incidence in summer in canines; and most of the cases were diagnosed during the spring periods as reported by Porchet *et al*. (2007). Analysis of the data of infected dogs from September 2014 to August 2015; revealed that peak numbers occurred from July to August. The present results revealed that the evidence of canine babesiosis is high during September 2014 and May2015 to August 2015 (4.0 % and 3.6 %, 4.40%, 5.20% and 5.60%, respectively). As this disease was spread by ticks *Rhipicephalus sanguineus* and their prevalence is also high during summer and rainy season. Higher incidence of canine babesiosis might be due to high ambient temperature and humidity, which seem to be more conducive for the sustenance of tick vectors *Rhipicephalussanguineus* as also reported by Bansal *et al*. (1985). A similar finding was recorded by Lorusso *et al*. (2010). According to them the largest population of ticks was found in August, September, January and July. The present observation of higher incidence during hot humid weather condition is in full agreement with the earlier observation of Varshney *et al*. (2003), Chaudhuri (2006) and Senthil *et al*. (2009).

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