

EPIDEMIOLOGY AND SEASONAL ABUNDANCE OF CANINE *BABESIOSIS* IN LAHORE, PAKISTAN

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ABSTRACT

Babesiosis is a tick borne protozoan disease of domestic and wild animals. Objective of this study was to record its seasonal prevalence in canine especially in dogs, came at the Pet Centre, University of Veterinary and Animal Sciences Lahore, Pakistan, which is the oldest and famous veterinary research hospital in Pakistan. The period of study was from January 2005 to December 2007. The blood samples were collected from the tip of the ear and blood smears stained with Diff-Quik and Giemsa stain which were examined under a microscope. According to the result the percentage of infection was highest during the summer and autumn months. The overall number / percentage were 54 % 1.21%, 173 % 3.25%, 75 % 2.11% and 13 % 0.54%, during Spring, Summer, Autumn and Winter season respectively, for the period from 2005 to 2007. Special measures and medicines were advised to the patient and additional precautions like tick spray, ticks bath and better hygienic conditions throughout the peak season were adopted.

Key word: *Babesia*, *Babesiosis*, Lahore, Seasonal occurrence.

INTRODUCTION

Piroplasmosis, a disease is caused by vector-borne parasites comprising two main genera, *Babesia* and *Theileria*. Piroplasmids are of international interest and one morphological similar protozoan parasites that exploit mammalian erythrocytes in their life cycle. A number of species and sub species are being reported in both dogs and cats. In Pakistan, several clinical descriptions have been published. Their presence is common during the summer season due to the high prevalence in these seasons by suppressing all other arthropod parasites and varieties of diseases which they transmit to livestock, poultry and to the domestic pets. (Castro and Newman, 2003). *Babesiosis*, *theileriosis* and *trypanosomiasis* are the important blood protozoan diseases in mammals and are of great importance in Punjab Anonymous, (1999). *Babesia* species are tick borne parasites (intra-erythrocytic apicomplexan) found in variety of domestic and wild animals. Schetters *et al.*, (1995) reported that *Babesiosis* in dogs and cattle cause severe economical and emotional losses.

Babesia is among the group of organisms called piroplasm, its name derives from their pear-shaped outline. Gardiner *et al.*, (1988) explained many different species of *babesia* existing with varying host specificity. Both *Babesia canis* and *Babesia gibsoni* are common for the infection in dogs. Both of these are found throughout Asia Africa, Europe, North America and the Middle East, and have *Ixodid* tick vectors whereas *Babesia canis* being more prevalent Taboada, (1998). Moreover, *Rhipicephalus sanguineus* and *Dermacentor variabilis*

are also believed to be the potential vectors of the disease Birkenheuer *et al.*, (1999). Evidence of animal to animal direct transmission is also found like during bites of an infected dog having abrasions to a naive dog. Poor ticks surveillance and control Kennels are at high risk for housed animals to develop *Babesiosis*, Birkenheuer *et al.*, (1999). There is seasonal prevalence; the greatest incidence is after peak of the tick population. Of the climatic factors, air temperature is the most important because of its effect on tick with activity- higher temperature, humidity and rainfall have little effect. Cases of canine *Babesiosis* range from a hyper acute, shock associated, hemolytic crisis to an inapparent, subclinical infection Taboada, (1998). The acute form of *Babesiosis*, is characterized by general findings such as pyrexia, weakness, pale mucous membrane, depression, lymphadenopathy, splenomegaly and general malaise Birkenheuer *et al.*, (1999). Anemia, thrombocytopenia, hypoalbuminemia and bilirubinuria are mostly documented during laboratory studies. Gardiner *et al.*, (1988); Taboada, (1998); Birkenheuer *et al.*, (1999). Initially normocytic, normochromic and non-regenerative anemia, later develops usually into a macrocytic, hypochromic, regenerative anemia with reticulocytosis (Gardiner *et al.*, 1988; Taboada, 1998). During the study of blood smear intraerythrocytic trophozoites are demonstrated, classically using by Giemsa, Romanowsky Field's and modified Wright's stains. Sampling of blood from capillary yields more diagnostic smears than sampling of blood from a larger vein (Perkins, 2000).

The control of ticks can be achieved by vaccination, by improving genetics, by fungi and bacteria (as bio-control) and chemical acaricides Willadsen,

(2006). Similarly control of *Babesiosis* can be achieved by various chemotherapeutic agents Vial and Gorenflot, (2006).

Study Areas: All the cases of *Canine* were recorded from the official register of Pet Centre, University of Veterinary and Animal Sciences.

MATERIALS AND METHODS

TECHNIQUES USED

Collection of Blood Sample from dogs: Blood sample were collected from the ear tips of the dogs after clipping and cleaning with a spirit swab. (Perkins 2000). The sharp needle was pricked to get a drop of the blood on the slide.

Preparation of Blood Smears: Thin blood smears of all blood samples prepared by adopting standard methods of Pershing *et al.* (1995) and Herwaldt *et al.* (1996)

Staining of Blood Smears: The slide of the blood smears were stained with the standard Giemsa's staining method Saal (1964). The slides were labeled in pencil or indelible ink and were kept in a slide box to be examined later.

Identification of *Babesia*: The slides thus prepared were examined under the microscope at 10X for the presence of the parasite. *Morphologically Babesia* parasites were identified by using light microscopy. By using a micrometer at 1,000 magnifications the size of parasites was determined Gad *et al.*, (2004).

RESULTS AND DISCUSSION

A total of 19,546 dogs, (6,171, 6,888 and 6,487 respectively) during the year 2005-2007, were examined at the Pet Centre, University of Veterinary and Animal Sciences, Lahore for the prevalence of *Babesiosis*. These dogs came to the pet centre for different reasons,

including infectious and non infectious diseases, routine check up, de-worming, vaccination, different traumatic injuries, accidental cases and health certifications. The dogs that came were all pet dogs of different age and gender. The seasons in Lahore, Pakistan were divided into four seasons, which were spring (March-April), summer (May-August), autumn (September-October) and winter (November-February).

Total number of dog cases registered during the spring season were 1,279, 1,275 and 1,372, during summer 2,349, 2,553 and 2,196, during autumn 1,004, 1,210 and 1,078, during winter 1,539, 1,850 and 1,841 in 2005, 2006 and 2007 respectively (table 1).

Overall numbers / percentage were 54 / 1.38%, 173 / 3.48%, 75 / 2.28% and 35 / 0.67%, during spring, summer, autumn and winter season respectively, in 2005-2007. (Figure 1).

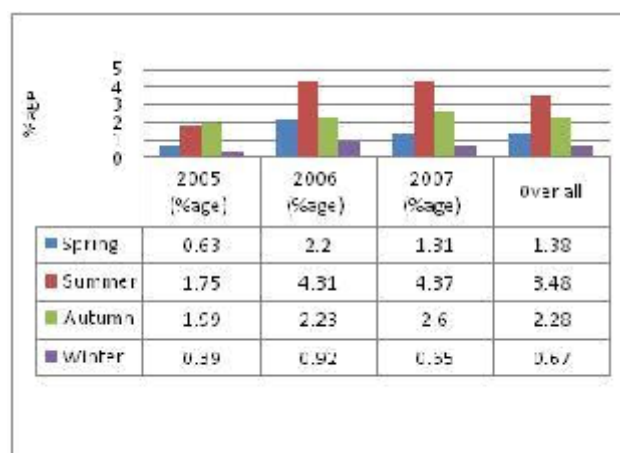


Figure 1: Occurrence of *Babesiosis* in different seasons

Table 1: Occurrence of *Babesiosis* in different seasons.

Month	Season	2005			2006			2007		
		Total dog case	<i>Babesia</i> Cases	<i>Babesia</i> Percentage	Total dog case	<i>Babesia</i> Cases	<i>Babesia</i> Percentage	Total dog case	<i>Babesia</i> Cases	<i>Babesia</i> Percentage
Mar	Spring	355	1	0.63	351	3	2.2	403	0	1.31
Apr		374	3		475	1		573	2	
May	Summer	552	4	1.75	637	4	4.31	719	10	4.37
June		727	4		638	24		653	8	
July		675	8		637	26		581	25	
Aug	Autumn	483	6	1.99	636	29	2.23	507	24	2.6
Sep		563	9		646	30		504	16	
Oct		628	18		634	25		604	31	
Nov	Winter	508	11	0.39	596	15	0.92	558	16	0.65
Dec		496	9		614	12		520	12	
Jan		371	2		561	12		552	8	
Feb		439	0		463	1		313	2	

The result reveals that the percentage of canine *Babesiosis* is high during summer and autumn as compared to the other seasons. As this disease is spread by the ticks and their prevalence is also high during summer and autumn. Similar findings were recorded by Lorusso *et al.* (2010) according to them the largest population of ticks was found in August, September, January and July.

A high prevalence was found in the pets which came for routine treatment, and concurrent infections with different hemoplasmas were frequently observed. Studies of hemoplasma infections in domestic dogs reveal that these agents are more commonly detected in regions with warmer climates, suggesting that distinct bloodsucking arthropods may play a role in the transmission of hemoplasmas in different countries.

In conclusion, hemoplasma infections especially *Babesiosis* in dogs, were highly prevalent during the season when there is high prevalence of ticks especially during spring and autumn. A strict tick control programme may be undertaken to control this disease by using registered pesticides at the proper time. Flea and tick repellent and checking daily for the presence of ticks especially at the nymphal stage which is the most likely stage to transmit the disease.

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