

PREVALENCE OF *BABESIOSIS* IN CATS IN LAHORE, PAKISTAN

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ABSTRACT

An epidemiological study was conducted at Pet centre, University of Veterinary and Animal Sciences Lahore for the prevalence of *Babesiosis* in cats. A total of (n=5,183) cats, during the year January 2007 to December 2009 were examined. The monthly prevalence of *Babesiosis* and distribution by age breed and gender were calculated by chi square test for comparison. The overall prevalence was 163 (3.14%) with significant difference ($p > 0.05$) among the different seasons. The prevalence rate was high during the year and the peak was found in summer and autumn. The passive surveillance /prevalence rate in male was 70(2.69%) and in females 93(3.6%). Overall prevalence rate of *Babesiosis* according to age were high with 28 (4.55%) among the cat age group of 25 months and above, 20(2.32%) in cats of 13 months to 24 months, 62(2.13%) in below six months, and 53(1.47%) in seven to 12 months and. Overall prevalence according to breeds were calculated in cross breed cats 106(3.22%), Persian 22(2.72%), Siamese 35(3.27%) and Himalayan 0(0.00%)

Key words: Prevalence, *Babesia*, *Babesiosis*, Cats.

INTRODUCTION

The most common worldwide tick borne infectious disease of animal, *Babesiosis*, and is attracting the researcher's attention by dint of its zoonotic importance. In dogs and cats, *Babesiosis* was originally considered as a tropical and subtropical disease, but at present it is also recognized with increasing frequency in temperate regions of the world. In the free roaming cats and dogs the extent of the population is a big problem especially for zoonotic diseases. These stray animals act as a reservoir of infectious diseases and the zoonotic vector borne diseases sharing the same micro environment as pet and humans.

Feline *Babesiosis* is less common and not well investigated as compared to the dogs. The present study will be based on the morphological studies of parasites obtained from a variety of wild and domestic hosts. The ticks have a role in the economy of a country as they are the potential blood sucking ectoparasites and especially in the summer season they suppress all other arthropods parasites in the number and the variety of different diseases that is transmitted to the domestic pet, livestock and poultry (Castro and Newman, 2003). *Babesiosis* in cattle, dogs and cats causes severe economical and emotional losses (Schettters *et al.*,1995). *Babesia* also called piroplasm, a name due to their pear shaped out lines. Many different species of *Babesia* exist with varying host specificity (Gardiner *et al.*1988).In cats, *Babesia felis* is the organism commonly known to infect. These have *Ixodid* tick vectors and are found throughout Asia, Africa, Europe, the Middle East and North America

(Taboada, 1998). In addition to it, *Rhipicephalus sanguineus* and *Dermacentor variabilis* are also believed to be the potential vectors of the disease (Birkenheuer *et al.*,1999). There is also a seasonal prevalence of clinical *Babesiosis* especially when there is a peak tick population. A climatic factor includes high temperature leading to its high prevalence. Following tick attachment the trophozoites of *Babesia* are released into the blood, infecting the erythrocytes. That is multiplied by binary fission within erythrocyte. Taboada, in 1998 reported that the cases of feline *Babesiosis* range from a hyper acute, shock associated, hemolytic crisis to an in apparent, sub-clinical infection. The symptoms as described by Birkenheuer *et al.*, 1999 of an acute form of *Babesiosis* include pyrexia, weakness, mucous membrane paled, depression, lymphadenopathy, splenomegaly and general malaise. According to the study of Gardiner *et al.*,1988; Taboada, 1998;and Birkenheuer *et al.*,1999 Laboratory test of *Babesiosis* showed anemia, thrombocytopenia, hypo albuminemia and bilirubinuria. Initially the anemia is normocytic, normochromic and non regenerative, but later develops into a macrocytic, hypochromic, regenerative anemia with reticulocytosis (Gardiner *et al.*,1988; Taboada,1998).

Babesiosis is diagnosed classically by demonstrating intraerythrocytic trophozoites in a stained blood smear by Giemsa, Romanowsky, Field's and modified Wright's stains. Blood derived from capillaries is more fruitful for diagnostic smear than large veins (Perkins, 2000). Seasonal other serodiagnostic tests are gaining wide popularity being increasingly available and more reliable.

MATERIALS AND METHODS

This study was performed during the years 2007 to 2009 at Pet Centre UVAS, Lahore, Pakistan. Information concerning the age (determined by questioning the owner and examining the dentition), and gender were recorded. The cats were categorized in four groups i.e. less than six months, between seven to twelve months, thirteen months to two years and 25 months to 5 years of age. The impact of season on prevalence was also recorded.

Collection of Blood sample: Blood sample was collected from the ear tips 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 was prepared by adopting standard methods of (Persing D.H.A. *et al.* 1995 and Herwaldt *et al.*, 1996)

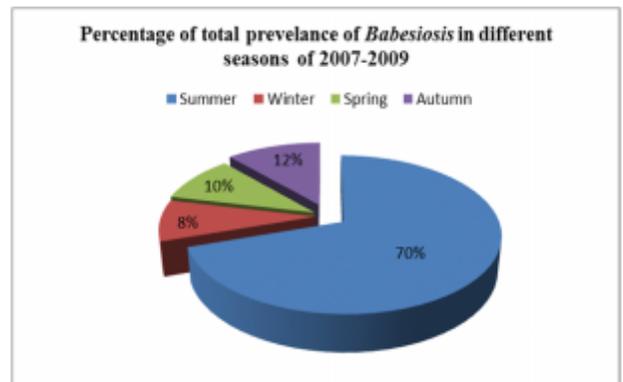
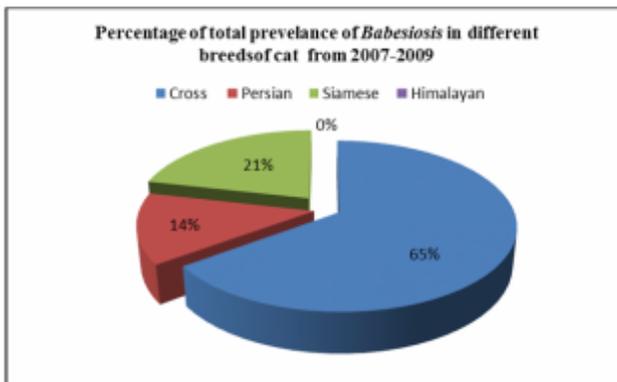
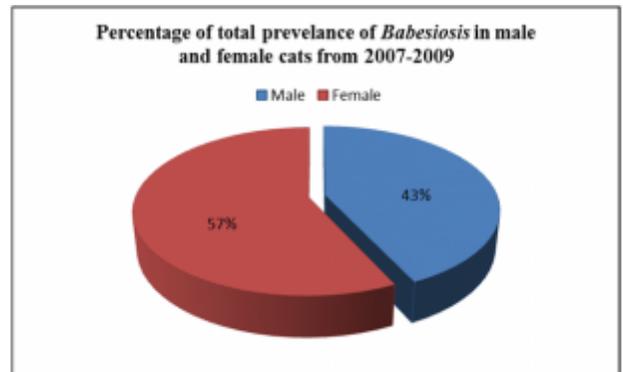
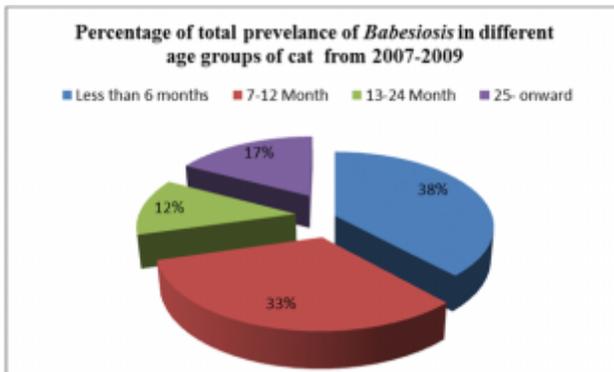
Staining of Blood Smears: The slide of the blood smears was stained with the standard Giemsa's staining method (Hendrix 1998). The slides were labeled in pencil or indelible ink and were kept in slide box to examine later on.

Identification of *Babesia*: The slides thus prepared were examined under the microscope at 10X for the presence

of the parasite. *Babesia* were identified with morphological description by using light microscope. The size of parasites were determined by using a micrometer at 1,000 magnifications (Gad Baneth *et al.*, 2004)

RESULTS AND DISCUSSION

A total of 5,183 cats, during the year 2007 to 2009 (1,579, 1,917 and 1,687) respectively were examined. The monthly wise prevalence of *Babesiosis* and distribution by age breed and gender were calculated by chi square test for comparison. The overall prevalence was 163 (3.14%) from 2007-2009 and 3.04%, 3.18%, 3.20% in 2007, 2008 and 2009 respectively with significant difference ($p > 0.05$) between different season. The prevalence rate was high during summer and autumn. The overall prevalence rate regarding sex was 70 (2.69%) in male out of 2,599 and 93(3.6%) in female out of 2,584 cats. Overall prevalence rate of *Babesiosis* from 2007 to 2009 in different age groups were high percentage of 28(4.55%) in the age groups consisting of above 25 month age, 62(2.13%) in the cats below six months of age, 53(1.47%) in the age group from seven to twelve months of age whereas 20(2.32%) in the cats of 13 months to 24 months of age. Overall Prevalence during 207 to 2009, according to breed were calculated as (3.22%, 2.72%, 3.27% and 0%) Cross breed, Persian, Siamese cats and Himalayan breed respectively.





Cross cat suffering from *Babesiosis*



Cross cat suffering from *Babesiosis*

Babesiosis, is a disease having major economic impact on the cattle industries with varying degrees of importance in horse, sheep, goats, pigs, dogs and cats throughout the world. *Babesia felis* has been reported in domestic cats in Africa and India. The data regarding cats is scarce while considering other sources, it was observed that in canine disease was found as 27% in United Kingdom, (Shaw *et al.*, 2003), France 45 percent (Credoz-Taupin 1995), Hungary 5.7 percent (Sandor, *et al.*, 2006). It is most commonly infectious disease of animals worldwide, with mild fever and anemia normally and in severe cases high fever be experienced causing haemolysis, secondary hepatic along with renal dysfunctions. During present study the younger cats were found to be more susceptible to *Babesiosis* which supports the idea of Gosh *et al.*, 2007 that *Babesiosis* could be more common in the younger animals and the animals that are free roaming in nature. The same observation was recorded by Mritunjay *et al.*, 2008. This age preference may be due to the increase susceptibility to infection and also having low immunity as compared to the older one. Prevalence of *Babesiosis* in cats was found high in humid seasons like in monsoon period (July-August). Similar results were also documented by different scientists (Birkenheuer *et al.*, 1999, Kar, *et al.*, 2008 and Pavlidou *et al.*, 2008), which might be due to the high risk of vectors during that period. Prevalence of *Babesiosis* in different breeds of cats showed that cross breeds and Siamese breeds were highly affected group while Persian and Himalayan cats were least affected. In the study by Martinod *et al.*, 1986, different breeds of dogs have different level of susceptibility irrespective of size. Disease was equally recorded among male and female cats as already mentioned in the data regarding cat in group irrespective of sex. <http://scialert.net/asci/author.php?author=Berhanuandlast=Mekibibn> dogs Martinod *et al.*, 1986 found no difference in susceptibility to *Babesia canis* among male and females. During present studies ticks and fleas were regularly collected from all cat cases. Different seasons

were found to have different concentration of ticks and fleas, but main species were found to be *Rhipicentor tick* and in fleas *Ctencephalides felis*. The study also showed that cross cats were more relished by ticks (65.7%) and fleas (48%), while in Persian cats (11.42%) ticks and (8%) fleas. However in Siamese and Himalayan cats the ticks and fleas were observed in much less concentration.

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