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. Piroplasms one 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 trypanosomosis 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 out line. 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 temperatures 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,
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.

<table>
<thead>
<tr>
<th>Month</th>
<th>Season</th>
<th>Total dog case</th>
<th>Babesia Cases</th>
<th>Babesia Percentage</th>
<th>Total dog case</th>
<th>Babesia Cases</th>
<th>Babesia Percentage</th>
<th>Total dog case</th>
<th>Babesia Cases</th>
<th>Babesia Percentage</th>
</tr>
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<tbody>
<tr>
<td>Mar</td>
<td>Spring</td>
<td>355</td>
<td>1</td>
<td>0.63</td>
<td>351</td>
<td>3</td>
<td>2.2</td>
<td>403</td>
<td>0</td>
<td>1.31</td>
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<tr>
<td>Apr</td>
<td></td>
<td>374</td>
<td>3</td>
<td>0.81</td>
<td>475</td>
<td>1</td>
<td>0.2</td>
<td>573</td>
<td>2</td>
<td>0.34</td>
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<tr>
<td>May</td>
<td></td>
<td>552</td>
<td>4</td>
<td>0.73</td>
<td>637</td>
<td>4</td>
<td>0.63</td>
<td>719</td>
<td>10</td>
<td>1.39</td>
</tr>
<tr>
<td>June</td>
<td>Summer</td>
<td>727</td>
<td>4</td>
<td>1.75</td>
<td>638</td>
<td>24</td>
<td>3.76</td>
<td>653</td>
<td>8</td>
<td>0.12</td>
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<tr>
<td>July</td>
<td></td>
<td>675</td>
<td>8</td>
<td>1.22</td>
<td>637</td>
<td>26</td>
<td>4.08</td>
<td>581</td>
<td>25</td>
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<tr>
<td>Aug</td>
<td></td>
<td>483</td>
<td>6</td>
<td>1.25</td>
<td>636</td>
<td>29</td>
<td>4.60</td>
<td>507</td>
<td>24</td>
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<tr>
<td>Sep</td>
<td>Autumn</td>
<td>563</td>
<td>9</td>
<td>1.63</td>
<td>646</td>
<td>30</td>
<td>4.65</td>
<td>504</td>
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<tr>
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<td>628</td>
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<td>634</td>
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<td>604</td>
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<td>Nov</td>
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<td>508</td>
<td>11</td>
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<td>596</td>
<td>15</td>
<td>2.52</td>
<td>558</td>
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<td>Dec</td>
<td>Winter</td>
<td>496</td>
<td>9</td>
<td>1.82</td>
<td>614</td>
<td>12</td>
<td>1.97</td>
<td>520</td>
<td>12</td>
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<tr>
<td>Jan</td>
<td></td>
<td>371</td>
<td>2</td>
<td>0.57</td>
<td>561</td>
<td>12</td>
<td>0.22</td>
<td>552</td>
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<tr>
<td>Feb</td>
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<td>0.00</td>
<td>463</td>
<td>1</td>
<td>0.22</td>
<td>313</td>
<td>2</td>
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</table>

Table 352
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 nyphal stage which is the most likely stage to transmit the disease.

REFERENCES


