

A six year (2006–2011) retrospective study of hemoprotozoan parasites affecting dogs in Chennai, Tamil Nadu, India

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Abstract With the changing global scenario there is effect not only on the human survival but also on the prevalence of existing pathogens and appearance of new infectious agents among animal population. This paper emphasises the need for prevalence studies. A retrospective study for 6 years on prevalence of hemoprotozoans in dogs in Chennai showed *Babesia gibsoni* the predominant parasite of dogs. Details are discussed in this paper.

Keywords Hemoprotozoans · Prevalence · Dogs

Introduction

The Indian subcontinent has a tropical climate which not only supports a diverse range of flora and fauna but also the pathogenic organisms flourish in these tropical conditions. The Indian dog population is estimated at 25 million of which 5 million are pets and the rest 80 % are family, community or feral dogs (Megat Abd Rani et al. 2010). These populations of dogs have been identified to serve as host for various hemoprotozoan parasites which include *Babesia gibsoni*, *Babesia canis*, *Ehrlichia canis*, *Hepatozoon canis* and *Trypanosoma evansi*.

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Many of the aforementioned blood protozoa have been reported earlier in the country. But there has been a variation in their distribution pattern as a consequence of climatic changes. This distribution change may also be attributed to increase in dog breeding practices, importation of new breeds of dogs and along with it new species of parasites as well. This paper addresses the need for prevalence studies for regular monitoring with the objective to analyse the current scenario and the associated changes in the incidence of hemoprotozoan parasites in animals.

Materials and methods

A total of 14,992 blood smears collected during the 6 year period spanning from January 2006 to December 2011 from dogs brought to Madras Veterinary College Teaching Hospital form the basis of the study. Peripheral blood smears were collected from dogs exhibiting clinical signs such as pyrexia coupled with haematuria, haemoglobinuria, tick infestation and lymphadenopathy. Smears screened as routine of pre-surgical check-up or post-surgical follow-up were not included in this study.

Results and discussion

Of the 14,992 smears that were screened, 1,986 (13.25 %) cases were positive for blood protozoa. There was a perceptible increase in the number of cases reported to the hospital with clinical signs warranting a blood smear examination. The number of cases rose from 1,404 in 2006 to 5,693 in the 2011. *B. gibsoni* ranked first among the hemoprotozoan infection in dogs accounting 56.65 %. This is followed by *E. canis* (23.21 %) and *H. canis* (11.23 %). Only

5.54 % of dogs were positive for *B. canis*. Thus *Babesiosis* alone accounted for nearly 62.19 % of the total infection. Both *B. canis* and *B. gibsoni* are recorded in India Chaudry and Varshney (2007) the awareness of the preponderance of *B. gibsoni* is only recent Senthil Kumar et al. (2004).

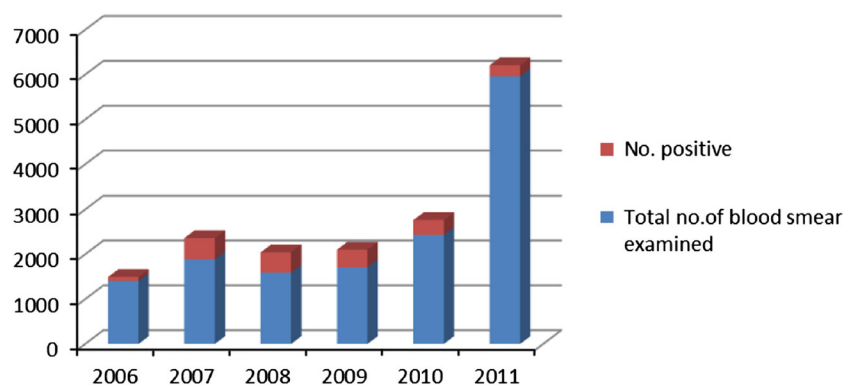
Reemergence of *B. gibsoni* in dogs at Chennai was reported in 2002 (Harikrishnan et al. 2002) and since then *B. gibsoni* is encountered regularly. Similar findings have been documented by Birkenheuer et al. (2005) in USA, where an increased incidence of *B. gibsoni* was recorded as against *B. canis vogeli*. This is in contrast to a report by Sundar et al. (2004) which revealed just 0.08 % incidence of *B. gibsoni* in Chennai.

Canine Monocytic Ehrlichiosis was first reported in India by Mudaliar (1944). Ehrlichiosis was later reported by Murali Manohar and Ramakrishnan (1982), Harikrishnan et al. (2001), Lakshmanan et al. (2007), Harikrishnan et al. (2009). Samaradhni et al. (2003) recorded Ehrlichiosis at Nagpur where 10.87 % of the cases were that of *H. canis*. The incidence of *H. canis* was reported by Pawar and Gatne (2005) in Mumbai. Most of the protozoans recorded are endemic to Tamil Nadu as well as to India. In such endemic areas a complication envisaged is the frequent presence of

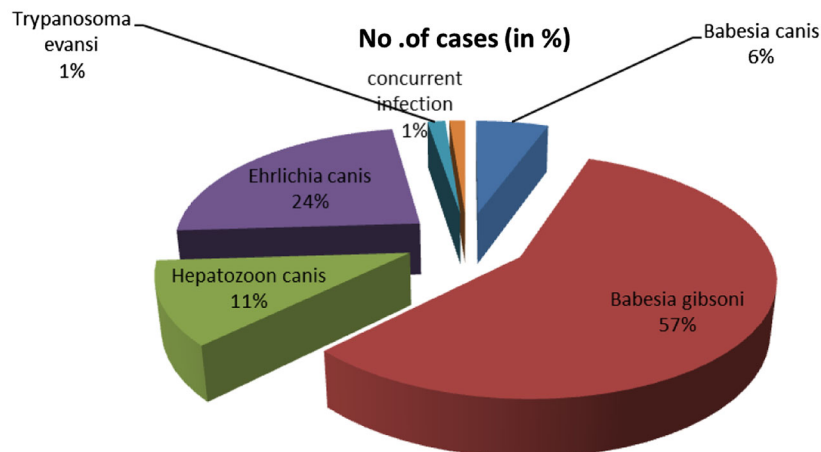
co-infection especially when the animals live in areas with high population density of vectors. One of the important vectors is *Rhipicephalus sanguineus* which transmits more than one pathogen. Importance is given to such co-infections as there are strong possibilities of the disease pathophysiology getting altered in such a scenario.

In this study 1.21 % dogs alone showed concurrent infection. These included concurrent infections of *B. canis* and *E. canis* (28.57 %), *B. canis* and *B. gibsoni* (4.76 %), *E. canis* and *B. gibsoni* (9.52 %), *E. canis* and *H. canis* (28.57 %), *H. canis* and *B. gibsoni* (28.57 %). Concurrent infections with *E. canis*, *B. canis* and *H. canis* have been reported by Mudaliar (1944), Murali Manohar and Ramakrishnan (1982), Juyal et al. (1994). In the recent past also, concurrent infections of *E. canis* with *H. canis* (Ramprabhu et al. 2001; Smitha et al. 2003; Ananda et al. 2005) and concurrent infection of *E. canis* with *B. gibsoni* have been reported (Harikrishnan et al. 2005). *Trypanosoma evansi* accounted for only 1.36 % of the total infection and they have biting flies as their vectors. An incidental finding was 0.81 % microfilaria in blood. Speciation of the microfilaria was however not carried out.

Year-wise data on number of protozoans recorded



Distribution pattern of Hemoprotozoan infections in Chennai from 2006-2011



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