

CO-INFECTION OF VECTOR- BORNE *BABESIA GIBSONI* AND *DIROFILARIA IMMITIS* IN A DOG - A REPORT

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SUMMARY

The present report describes about the successful management of a rare co-infection of vector-borne *Babesia gibsoni* and *Dirofilaria immitis* in a 7 month old pug puppy.

Keywords: *Babesia gibsoni*, Co-infection, *Dirofilaria immitis*, Dog

The risk of co-infections of arthropod-borne diseases are expanding in new regions as a result of various climate change that allows vectors to move and spread infectious diseases into new areas (Vichova *et al.*, 2014). The tick-borne *Babesia gibsoni* infects pets' red blood cells, causing hemolytic anaemia, fever, lethargy and thrombocytopenia while the mosquito-borne heart worm lives in the heart, lung and associated blood vessels of affected dogs, causing severe lung disease, heart failure and damage to other organ in the body. Tick-borne *Babesia gibsoni* infections are more frequent than filarial infections with *D. immitis* in North Eastern Region of India (Sarma *et al.*, 2019).

The present report describes about a rare co-infection of heart worm and *Babesia gibsoni* in a seven month old male pug pup presented to the Teaching Veterinary Clinical Complex, College of veterinary Sciences and Animal Husbandry, R.K. Nagar, West Tripura, Tripura with clinical signs of exercise intolerance, coughing, gasping and history of treatment for the last one month. The detailed clinical examination showed normal temperature (102 °F), elevated pulse and heart rate (130/min), very pale visible mucous membrane and enlarged popliteal lymph node. The capillary refill time (CRT) was 4 second. Abdominal palpation revealed the presence of mass in the peritoneal cavity. Auscultation of heart revealed right sided heart murmur while auscultation of lung showed crackles. Ultrasonography and X-ray examination revealed splenomegaly and the Vertebral Heart Score (8.8) was within normal reference range. Haematological studies were conducted by using Vet haematology analyser (BC-2800). The serum biochemical parameters and enzymatic activities were determined by double beam spectrophotometer using standard kits.

Microfilariae were confirmed by modified Knott's test (Genchi *et al.*, 2005) and *Babesia gibsoni* by using Giemsa stain.

Blood smear examination with Giemsa stain showed the presence of signet ring shaped *B. gibsoni* (Fig. 1), while, direct and Knott's method on blood examination revealed microfilaria of *Dirofilaria immitis* (Fig. 2). Haemato-biochemical values showed anaemia (haemoglobin, 4 gm/dl, packed cell volume, 14%, total erythrocyte count, $1.64 \times 10^6/\mu\text{l}$, mean concentration of haemoglobin, 24.3 pg) and elevated values of liver enzymes [aspartate aminotransferase (98 U/L), alanine aminotransferase (92 (U/L)]. Concurrence findings were reported in canine babesiosis case from Tripura (Kumar *et al.*, 2013). The serum creatinine (1.2 mg/dl), blood urea nitrogen (21 mg/dl) and alkaline phosphatase (8 IU) were within normal reference values.

The treatment of heart worm was instituted with inj ivermectin @ 0.2 ml subcutaneously at monthly intervals for six months and doxycycline 100 mg @ 1 tab orally once daily for 30 days since long term combined therapy of low dose ivermectin and doxycycline resulted in a significant faster decline in circulating microfilariae and higher adulticide activity in dogs (Bazzocchi *et al.*, 2008). The herbal hepato-stimulant was also given @ 5 ml orally twice daily for 1 month. Doxycycline efficacy against migrating tissue-phase larvae and juvenile worms has been reported (McCall *et al.*, 2011), whereas, ivermectin was used to eliminate adult worms with less potential for thromboembolism and perivascular inflammation (Kumar *et al.*, 2014). The *Babesia gibsoni* infection was treated with inj clindamicin @ 0.8 ml IM bid for 15 days as clindamicin gradually reduces parasitemia levels and gradually induces morphological changes by degeneration

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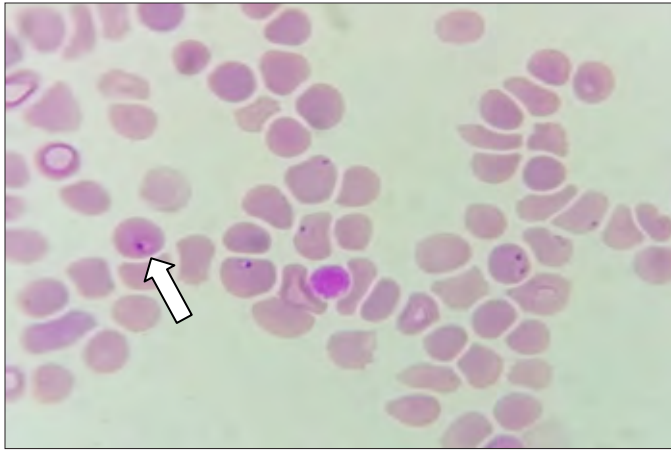


Fig.1. Signet ring shape (arrow) of *B. gibsoni* in RBC

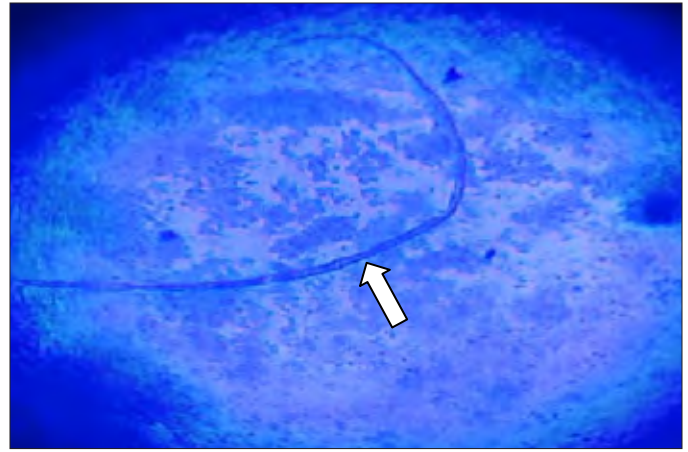


Fig.2. Microfilaria (L-1) of *Dirofilaria immitis*

of parasites in the majority of *Babesia gibsoni* infected dogs (Wulansari *et al.*, 2003). Besides, dog was given iron dextran @ 0.5 ml IM at 3 days intervals for 5 times to overcome severe anaemia associated with babesiosis even though iron may itself act as oxidant and usually not recommended initially in treatment as excess iron may lead to increased oxidative damage. Abnormalities identified with heart worm infection may include mild non-regenerative anaemia, neutrophilia and eosinophilia (Calvert and Rawlings, 1988) while haemolytic anaemia is characteristic of babesiosis. Prevalence of *B. gibsoni* and *H. canis* infection, and their co-infection was reported in dogs presented with clinical disease in Mizoram and Tripura states of India (Sarma *et al.*, 2019). The dog showed uneventful recovery after treatment and the *B. gibsoni* and microfilaria of *D. immitis* were not present in blood on day 7 of treatment on microscopic examination. Besides, haemato-biochemical values were found towards normal reference range. Thereafter, the pup was regularly examined at 15 days intervals for 6 months for the presence of microfilaria and *Babesia* spp. and both the organism were found to be absent in the blood sample.

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