## CLINICO- HAEMATOLOGICAL ALTERATION IN A LABRADOR DOG AFFECTED WITH BABESIOSIS AND ITS THERAPEUTIC MANAGEMENT

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## SUMMARY

A Labrador pup, four months old was presented with the history of anorexia, lethargy, high fever, marked yellow faeces. Thin blood smear examination by Giemsa staining method revealed the presence of *Babesia canis*; pyriform shaped organisms inside the RBCs. Haematological examination revealed anemia, thrombocytopenia and increase in number of circulating reticulocytes. Serum biochemistry revealed hypoalbuminemia, increase amounts of bilirubin in serum, elevated level of liver enzymes (ALT, AST and ALP). Subsequently, the animal was treated with a single dose of Inj. Imidocarb dipropionate @6.6 mg/kg, SC. Fiprofort Plus spot -on was applied topically for tick management, as it is a tick-borne disease. Giemsa stained thin blood smears were found to be negative after 10 days of treatment, followed by an uneventful recovery.

Keywords: Anemia, Babesia canis, Imidocarb dipropionate

Canine babesiosis is a worldwide disease in dogs, mainly caused by the two species of hemoprotozoan parasite viz. *Babesia canis* and *Babesia gibsoni*. *Babesia canis*, a large form 4-5  $\mu$ m in length, pyriform in shape, infecting the erythrocytes and is transmitted by the bite of *Rhipicephalus sanguineus* tick (Homer *et al.*, 2000). The present communication reports haematobiochemical alteration in a dog affected with Babesia canis and its therapeutic management.

A Labrador pup, four months old was presented to OPD, College of Veterinary and Animal Sciences, SVPUAT, Meerut, with a history of anorexia, lethargy, high fever, marked yellow faeces. Peripheral blood as well as whole blood was collected for laboratory examination to assess various blood parameters. The blood samples were also collected in heparinised vials for harvesting plasma for biochemical analysis. Plasma concentration of aspartate amino transferase (AST), alanine amino transferase (ALT), alkaline phosphatase (ALP), albumin and total bilirubin were determined by veterinary specific blood and clinical chemistry auto- analyzers (Mindray BC-2800 Vet and Agappe mispanano).

On clinical examination of the pup, body temperature was 104 °F, pale mucous membranes, spleenomegaly, jaundice and dullness were observed (Fig. 1) The diagnosis of babesiosis was confirmed by demonstration of the parasites within the infected erythrocytes in Giemsa stained thin blood smears. These are lightly basophilic pyriform as well as in tetrads as cruciform shaped with indistinct internal structures (Fig. 2) Haematobiochemical examination revealed leucocytosis with neutrophilia and eosinophilia, attributed to the inflammatory conditions induced by *B. canis* infection. Decreased haemoglobin, PCV, TEC, platelet count, increase in percentage of 
 Table 1

 Blood picture of the pup infected with Babesia canis

Blood Parameters	Patient's Values	Reference Values
		(Klaassen, 1999)
Total leucocyte count (103/µl)	23	6-17
Neutrophils (%)	91	58-85
Eosinophils (%)	10	0-9
Haemoglobin (g/dL)	7.8	12-19
PCV (%)	20	35-57
Total erythrocyte count $(106/\mu l)$	4.0	5.0-7.9
Platelet count (103/ $\mu$ l)	160	211-621
Reticulocytes (%)	3	0-1.0
Total protein(g/dl)	5.1	5.4-7.5
Serum albumin(g/dl)	2.0	2.3-3.1
Bilirubin(mg/dl)	0.9	0-0.3
ALT (IU/L)	125	10-109
ALP(IU/L)	152	44-147
AST(IU/L)	35	13-15

reticulocytes, decreased total protein, albumin, increase amounts of bilirubin and elevated level of liver enzymes :ALT, ALP, AST (Table 1) were observed.

Subsequently, the animal was treated with a single dose of imidocarb dipropionate (6.6 mg/kg, SC). Supportive treatment was made with hepatoprotectant; inj. Neohepatex TM (liver extract with vit B12, Biological E limited, India) @ 2 ml IM, BID; hematinic syp. Dexorange TM @ 10 ml, PO, BID. Fiprofort Plus TM (Fipronil + S-methoprene) spot -on was applied topically for tick management. Giemsa stained thin blood smears were found to be negative, 10 days after treatment. Animal started taking food. Temperature also subsided to100.5 °F. Though, current treatment strategies alleviate the clinical signs, but these blood parasites are rarely completely eliminated and whenever the immunity of animal lowers

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Fig. 1. Whitish conjunctival membrane



Fig. 2. *Babesia canis*, a large piroplasm and in tetrads as cruciform in erythrocytes of naturally infected dog (Giemsa stained blood smear under 100 X magnification)

the chances of reoccurrence of disease may occur (Irwin, 2010). Therefore, it is advised to the animal owners for control of ticks by regular spraying of anti-tick preparations in order to prevent recurrence and spread of further infection.

Light microscopy is highly specific and can be used to diagnose large forms of Babesia (e.g. B. canis). Also cure and a good therapeutic response are much more successful with infections of large-sized Babesia spp. as compared to infections by the small-sized species (Solano-Gallego and Baneth, 2011). Anemia and thrombocytopenia are the primary hematological abnormalities found in affected dogs (Furlanello et al., 2005). It is believed that the clinical signs are the result of tissue hypoxia following the anaemia and a concomitant systemic inflammatory response syndrome caused by marked cytokine release (Lobetti, 2006). The typical clinical sign observed in animals with babesiosis is hemolytic anemia (Jacobson and Clark, 1994), which is attributed to number of factors like, initiation of mechanism of antibody-mediated cytotoxic destruction of circulating erythrocytes, increased osmotic fragility of erythrocytes and serum hemolytic factors. Another root cause is production of autoantibody against the components of membranes of infected as well as uninfected erythrocytes causing intravascular and extravascular hemolysis (Irwin, 2005). Thrombocytopenia could be due to platelet sequestration in the spleen or immune mediated platelet destruction and development of disseminated intravascular coagulation (Boozer and Macintire, 2003). The hematological findings were in accordance with Sivajothi et. al. (2014). Showkat et. al. (2011) in their study indicated that Babesia infection in dogs apparently cause anemia and thrombocytopenia, which is in agreement with our results. In a study by Suresh et. al. (2017), the affected dogs showed significant increase in serum bilirubin, ALT, AKP, BUN and creatinine which is similar to our findings. Thus, our present work will be helpful in providing an insight to field veterinarians/ academicians and also to pet owners on the aspect of canine babesiosis, its diagnosis, treatment and management.

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