

Management of *Babesia gibsoni* infection in a Great Dane Dog

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Abstract

Canine babesiosis is a hemolytic disease which is caused by *Babesia canis* and *B. gibsoni*. In this case report, a two-year-old male Great Dane dog was presented with the history of inappetence, dullness and partial blindness for last 10 days. Animal was dull with elevated rectal temperature, slightly tachycardia and hyphema. Thrombocytopenia, elevated liver enzymes, anemia, leukocytosis and increased blood urea nitrogen were observed. Blood smear examination showed presence of intra-erythrocytic piroplasm organisms. Upon confirmatory diagnosis with *B. gibsoni*, the treatment was initiated with Atovaquone in combination with Azithromycin. Hematinic, antioxidant, platelet booster syrup and hemostatic drugs were given twice daily for 5 days. The animal had uneventful recovery following therapy.

Keywords: *Babesia gibsoni*, Blindness, Atovaquone, canine

Introduction

Canine babesiosis is one of the most significant and potentially fatal hemoprotozoan diseases transmitted by ticks to dogs. Babesiosis produced by *Babesia gibsoni* is less severe and persistent than *Babesia canis*. Clinical signs include anorexia, lethargy, icterus, vomiting, and loss of body condition. Although paraplegia, blindness, ocular bleeding, immune-mediated haemolytic anaemia are rare findings, but were noticed by some clinicians (Gonde *et al.*, 2017). This article describes clinical manifestation of Babesiosis and its management in a dog.

Case History and Observations

A 1.5-year-old male Great Dane dog was presented to Teaching Veterinary Clinical Complex, ICAR- Indian Veterinary Research Institute, Izatnagar with a history of fever, weakness, anorexia, dullness, tick infestation, blindness, dark yellow urine, tarry colored feces and erythematous skin lesions on the ventral abdomen. On clinical examination, the animal was having high temperature (105°F), increased heart rate (125 Beats/ minutes), and enlarged popliteal lymph nodes. Congested conjunctival mucus membrane (Fig. 1a), hyphema (Fig. 1b) and echymotic haemorrhagic lesions on the inguinal region (Fig. 2a) were noticed. Pupillary light reflex was sluggish in both eyes and

the animal was unable to see obstacles. Decreased haemoglobin, packed cell volume, erythrocytopenia, and thrombocytopenia, along with leucocytosis were observed. Increased levels of total protein, globulin, serum glutamic oxaloacetic transaminase (SGOT), alkaline phosphatase (ALP), blood urea nitrogen (BUN), and creatinine were observed (Table 1). Blood smears revealed the presence of intra-erythrocytic *Babesia gibsoni*, and few spherocytes (Fig.3). Confirmatory diagnosis was done through PCR which revealed *B. gibsoni* (Fig.4).

Treatment and discussion

The treatment regimen was initiated with Atovaquone (@13.3 mg/kg twice a day) in combination with Azithromycin (@10 mg/kg once a day, orally for 10 days). Supportive therapy included DNS (@ 25mg/kg b. wt. once daily IV for 3 days), hematinic (Iron, folic acid and vitamin B12- 8-10 ml orally), antioxidant (Ascorbic Acid @20mg/kg PO), platelet booster syrup (extract of *Cariya papaya* leaves, *Tinospora cordifolia* and *Andrographis paniculate*- 10 ml PO), hemostatic drugs (Ethamsylate- 300 mg total dose PO BID twice daily for 5 days). Prednisolone (@2 mg/kg b. wt. IM twice a week) was administered to manage immune-mediated haemolytic anaemia. There was significant improvement in clinical signs, improvement in vision and had complete recovery in 10 days.

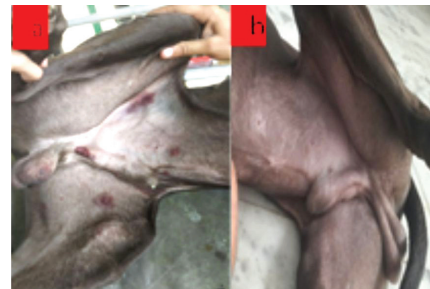
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Table 1. Haemato-Biochemical values

Parameters (%)	Day of presentation (before therapy)	10 days post-treatment	Reference range
Hb (g/dl)	10	11	12-18
PCV (%)	29.5	34	37-55
TEC ($\times 10^6 / \mu\text{l}$)	3.8	4.5	5.5-8.5
TLC ($\times 10^3 / \mu\text{l}$)	19.7	14.6	6-17
Neutrophils (%)	70	71	60-77
Lymphocytes (%)	22	13	12-30
Monocytes (%)	08	06	3-10
Eosinophil (%)	01	00	3-10
Basophil (%)	00	00	0-1
Platelets ($\times 10^6 / \mu\text{l}$)	42	210	150-450
Total protein (g/dl)	9.6	7.9	5.4-7.5
Albumin (g/dl)	2.8	3.1	2.3-3.1
Globulin (g/dl)	6.8	2.9	2.3-3.1
SGPT(IU/L)	43.5	92	10-109
SGOT(IU/L)	102.5	48	13-15
ALP(IU/L)	385	109	76-119
BUN (mg/dl)	88	32	8-28
Creatinine(mg/dl)	1.14	1.10	0.5-1.7



**Fig. 1: a Congested conjunctiva
b Hyphema c After therapy**



**Fig. 2: a Ecchymotic haemorrhage on inguinal region.
B No Ecchymotic haemorrhage on inguinal region**

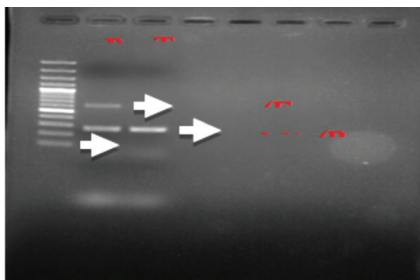


Fig. 3: Confirmation of *B. gibsoni* in the blood sample of a dog by PCR and 2D gel electrophoresis. L: Ladder, PC: Positive Control, TS: Test Sample

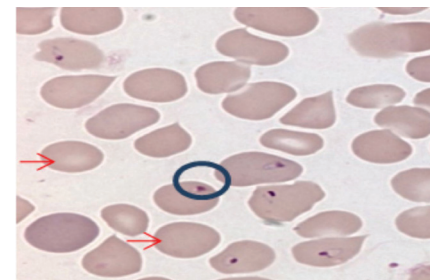


Fig. 4: Identification of *B. gibsoni* by microscopical examination. Blue circle: *B. gibsoni*; RBC with Red arrow: Spherocytes.

Decreased Hb and RBC levels might be due to direct mechanical disruption caused by parasite as it leaves red blood cells, intravascular hemolysis, and immune-mediated or non-immune mediated destruction of red blood cells or due to severe anemia (Venkatesakumar *et al.*, 2018). Rise in level of ALP could be due to damage or dysfunction of biliary system. Increased activities of ALT were might be due to escape of these enzymes from the damaged hepatic parenchymal cells either because of necrosis or changes in membrane permeability, indicating impaired hepatic function (Reddy *et al.* 2014). Atovaquone selectively block protozoan mitochondrial electron transport causing inhibition of pyrimidine and ATP synthesis whereas azithromycin is a macrolide antibiotic that binds to the 50S subunit of the prokaryote ribosome and inhibits the translation of mRNA and bacterial protein synthesis (Baneth, 2018). Additionally, Prednisolone acetate has been administered to mitigate auto-immune haemolysis.

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