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## Successful clinical management of canine babesiosis: A case report

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### Abstract

A three-years-old male Labrador dog with inappetence, pyrexia, weakness, vomiting, blood in the urine, and lateral recumbency since a week had been brought in. Clinical examination exhibited icteric mucous membranes, dehydration, high fever as well as ticks on the body surface. Anemia, leucocytosis, and thrombocytopenia were found in the bloodwork. BUN, creatinine, ALT, AST, and total bilirubin levels were all increased in the serum biochemical examination. *Babesia gibsoni* was found to be present in RBCs under microscope. Babesiosis was identified based on the patient's medical history, clinical symptoms, and laboratory findings. Imidocarb dipropionate, doxycycline, and supportive therapy were all used to treat the dog successfully.

**Keywords:** Imidocarb dipropionate, babesiosis, icteric mucus membrane, ticks

### Introduction

Canine Babesiosis is a clinically important and widely distributed hemoprotozoan illness in domesticated dogs and wild canids (Irwin, 2010) [5]. The tick vector *Rhipicephalus sanguineus* transmits it naturally. Tick-borne diseases have emerged and re-emerged as the dog population has grown and climatic circumstances have changed. *Babesia gibsoni*, a small piroplasm, or *Babesia canis*, a big piroplasm, are the most common causes of the disease. The species that causes canine babesiosis must be determined for diagnostic purposes, as each organism's virulence, prognosis, and reaction to anti-babesial medications may differ. The degree of parasite proliferation in the host's erythrocytes and subsequent cell lysis determines the severity of babesiosis. High fever, jaundice, pale or icteric mucous membranes, hematuria and epistaxis lymphadenopathy, and thrombocytopenia are common in dogs with babesiosis (Vial and Gorenflot, 2006; Gonde *et al.*, 2016) [13, 3]. Because it is a cost-effective diagnostic procedure, direct microscopic inspection of the stained blood smear is the most widely employed method [2].

Clinical symptoms of complex babesiosis are determined by the type of complication that occurs. Acute renal failure (ARF), hepatopathy with prominent icterus, and hypoglycemia are all symptoms of the severe form of the disease, which includes considerable haemolytic anaemia, severe acid-base abnormalities, and frequent secondary multiple organ failure. The dogs with haemo-concentrated babesiosis suffer acute renal failure, acute respiratory distress syndrome, or cerebral babesiosis have the worst prognosis, with fatality rates exceeding 50% and approaching 100% in some cases [8]. The current communication discusses about canine babesiosis caused by the *Babesia gibsoni* and its clinical management.

### Case History & Clinical Findings

A three-years-old male Labrador retriever was brought to the VCC, College of Veterinary Science, AAU, Khanapara, Assam, with a seven-day history of decreased food intake, vomiting, blood mixed urinating, and lethargy. The owner stated that the dog had received routine vaccinations and deworming. The infected dog's body temperature was 103.2<sup>o</sup> Fahrenheit, the visible mucous membrane was icteric, and ticks were identified on the body surface during clinical exams. Blood samples were examined for haemato-biochemical changes and the presence of haemoprotozoa for diagnostic purposes. Anemia, erythrocytopenia, thrombocytopenia, and leucocytosis were recorded on hemogram (Table: 1). Hyperbilirubinemia, azotemia, and elevated alanine aminotransferase activity were found in

the serum biochemistry. *Babesia gibsoni* was found in RBCs in a blood smear produced from peripheral blood and stained with Giemsa stain and viewed under oil immersion (x100) (Fig. 1). The case was diagnosed as canine Babesiosis based on clinical signs, tick history, and microscopic inspection of a blood smear. On days 0<sup>th</sup> and 21<sup>st</sup>, blood samples were obtained for haemato-biochemical and parasitological analysis.

**Table 1:** Hemato-biochemical parameters comparison between 0<sup>th</sup> day and 21<sup>st</sup> days of treatment in dog with Babesiosis

Parameters	0 <sup>th</sup> day of treatment	21 <sup>st</sup> day of post treatment
Hb(g/dl)	7.2	10.7
PCV(%)	21.5	32.1
TEC (10 <sup>6</sup> /mm <sup>3</sup> )	4.7	5.9
TLC (10 <sup>3</sup> /mm <sup>3</sup> )	17.5	12.3
Platelets (10 <sup>5</sup> /mm <sup>3</sup> )	101	174
BUN (mg/dl)	72	57
Creatinine (mg/dl)	2.3	1.4
Total bilirubin (mg/dl)	0.9	0.4
AST (U/L)	68	55
ALT (U/L)	82	60



**Fig 1:** Microscopic view of *Babesia gibsoni* in RBCs of the infected dog

### Treatment & Discussion

The therapeutic management of canine babesiosis in this case included injecting imidocarb dipropionate at a rate of 6.6 mg/kg B.W. subcutaneously for two doses separated by 14 days, and injecting atropine sulphate at a rate of 0.04 mg/kg B.W. subcutaneously 15 minutes before Imidocarb administration. The antibiotic Doxycycline was given orally for 21 days at a dose of 10 mg/kg body weight per day. The supportive treatment includes fluid replacement via IV infusion of 5 percent DNS followed by Ringers lactate (RL) for 7 days, (ii) Pantoprazole @0.5 mg/kg IV daily for 7 days, and (iii) Ondansetron at a rate of 0.5 mg/kg body weight for 7 days. To control vomiting, it was given intravenously. Injection of Vitamin B-complex @2ml IV OD for 5 days, followed by 2 tsf.hematinic syrup PO BID for 7 days.

Ticks carry *Babesia* species, which are intra-erythrocytic parasites. The presence of merozoites in a peripheral blood smear is commonly used to diagnose *Babesia* spp. infection. Fever, anorexia, dullness, hemoglobinuria, icterus, anaemia, and thrombocytopenia were seen in this instance, which were also reported by Peterson, 2006; Nelson and Couto, 2009 [10, 11]. Hb, PCV, TEC, and total platelet count were all significantly lower in the dog, following treatment although they returned to normal. Low haemoglobin levels indicate anaemia, which could be caused by haemoglobin loss owing to RBC rupture in dogs (Kshama, 2017; Venkatesakumar *et*

*al.*, 2018) [9, 12].

Furthermore, there is was a significant decrease in PCV and total RBC count, which could be attributable to *Babesia gibsoni*-induced reductions in RBCs in the blood (Birkenheuer, 2012; Harrus *et al.*, 1997; Venkatesakumar *et al.*, 2018) [1, 4, 12]. Because of the parasites' poisons, the affected dog developed leukocytosis. *Babesia* causes hemolytic anemia and multiple organ dysfunction syndrome (MODS), both of which are caused by the systemic inflammatory response syndrome (Jadhav *et al.*, 2011) [6]. The current communication showed a raised amount of bilirubin and increased ALT activity, both of which are signs of liver stress, which could be caused by inflammatory cytokines or hypoxia that causes liver damage (Gonde *et al.*, 2016) [3]. In our case, the high BUN and creatinine were most likely related to babesiosis, which damages renal cells due to the development of refractory hypotension, resulting in decreased renal tissue perfusion and glomerular filtration rate (Zygner and Wedrychowicz, 2009; Venkatesakumar *et al.*, 2018) [14, 12]. In the current investigation, Imidocarb dipropionate treatment was found to be beneficial. Imidocarb's mechanism comprises nucleic acid damage and cellular repair and replication inhibition (Karunakaran *et al.*, 2011; Birkenheuer, 2012) [7, 1]. The present case was followed up on the twenty-first day of treatment. A peripheral blood smear stained with Giemsa stain on day 21 after therapy revealed that *Babesia gibsoni* was not present. The haemato-biochemical parameters were greatly improved. The dog recovered completely clinically, with a spectacular response and uneventful recovery. The treatment of babesiosis in dogs requires both specific and supportive techniques. The goal of supportive treatment is to restore appropriate tissue oxygenation by correcting anaemia, particularly if it is severe, as well as dehydration and electrolyte abnormalities.

### Conclusion

The results of this clinical case study demonstrated that a combination therapy of Imidocarb dipropionate@6.6mg/kg and Doxycycline @ 10mg/kg, together with supportive therapy, is effective against *B. gibsoni* with no side effects and the dog recovered without difficulty.

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