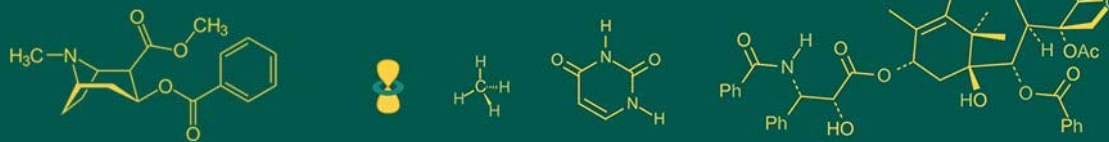


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**Bendangla Changkija**  
 College of Veterinary Science,  
 Assam Agricultural University,  
 Khanapara, Assam, India

**Habung Nakang**  
 College of Veterinary Science,  
 Assam Agricultural University,  
 Khanapara, Assam, India

**Ditul Barman**  
 College of Veterinary Science,  
 Assam Agricultural University,  
 Khanapara, Assam, India

**Arabinda Phukan**  
 College of Veterinary Science,  
 Assam Agricultural University,  
 Khanapara, Assam, India

**Deepa Lahkar**  
 College of Veterinary Science,  
 Assam Agricultural University,  
 Khanapara, Assam, India

**Pallavi Devi**  
 College of Veterinary Science,  
 Assam Agricultural University,  
 Khanapara, Assam, India

**Manoj Kumar Kalita**  
 Lakhimpur College of  
 Veterinary Science, Assam  
 Agricultural University,  
 Joyhing, North Lakhimpur,  
 Assam, India

**Prerona Patowary**  
 Assam Agricultural  
 University-Goat Research  
 Station, Burnihat, Kamrup  
 (M), Assam, India

**Corresponding Author:**  
**Prerona Patowary**  
 Assam Agricultural  
 University-Goat Research  
 Station, Burnihat, Kamrup  
 (M), Assam, India

## Canine babesiosis: A report of two different cases

**Bendangla Changkija, Habung Nakang, Ditul Barman, Arabinda Phukan, Deepa Lahkar, Pallavi Devi, Manoj Kumar Kalita and Prerona Patowary**

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### Abstract

Canine babesiosis is a common worldwide tickborne disease. Based on the examination of peripheral blood smears, two dogs were found to be positive for babesiosis. In case-1, the dog was presented with a history of fever, accompanied by inappetence and weakness whereas case-2 dog had fever, vomiting, anorexia and oliguria. Clinical examination of both the cases revealed pale and icteric mucous membrane, dehydration, high fever as well as presence of ticks on the body surface. Anemia, leucocytosis, and thrombocytopenia were found in the bloodwork. Creatinine, urea, ALT, AST, and total bilirubin levels were increased in the serum biochemical examination. Imidocarb dipropionate was used in conjunction with supportive therapy to treat both dogs. Case-1 recovered after treatment due to uncomplicated condition however case-2 did not respond to the treatment and died from acute renal failure brought on by babesiosis complication.

**Keywords:** Babesiosis, acute renal failure, icterus, ticks, imidocarb dipropionate

### Introduction

Canine babesiosis, a hemoprotozoan disease that affects both domesticated dogs and wild canids, is a clinically severe and geographically widespread illness [5]. It is naturally spread by the tick vector *Rhipicephalus sanguineus*. With the growth of the dog population and changes in climate, tick-borne diseases have emerged and re-emerged. The most frequent causes of the illness are *Babesia canis*, a large piroplasm, or *Babesia gibsoni*, a tiny piroplasm. Clinically, the illness can be divided into simple and complex variants. It has been proposed that uncomplicated canine babesiosis results from hemolysis, whereas severe canine babesiosis results from the development of multiple organ dysfunction syndrome (MODS) and systemic inflammatory response syndrome (SIRS) [16]. The severity of babesiosis is determined by the amount of parasite proliferation in the host's erythrocytes and the consequent lysis of cells. Acute renal failure (ARF), significant icterus in the hepatopathy, and hypoglycemia are signs of the disease's severe form, which also involves significant hemolytic anaemia, severe acid-base abnormalities, and multi-organ failure. Present communication reports both the forms of babesiosis in dogs and its clinical management.

### Case history and Clinical Findings

**Case-1:** A 15 months old, male Labrador retriever dog was presented to Veterinary Clinical Complex, College of Veterinary Science, AAU, Khanapara, Assam, India with history of fever, reduced intake of food and dullness. Clinical examination of the dog revealed pyrexia (103.1°F), tachycardia (172 bpm), pale visible mucous membranes, dehydration and presence of ticks (++) on the body surface. Peripheral whole blood was collected in EDTA vial (Levaram lifesciences pvt ltd) for laboratory examination. Blood smear examination revealed presence of piroplasmic *Babesia canis* organisms in the RBC (Fig.1). Haematology revealed leucocytosis with decreased haemoglobin level, PCV, TEC, thrombocytopenia and serum creatinine, urea, ALT, AST, and total bilirubin levels were increased (Table 1).

**Case-2:** A 7 years old, female German shepherd dog was presented to Veterinary Clinical Complex, College of Veterinary Science, Khanapara, Assam with a history of fever,

anorexia, oliguria with reddish coloured urine, severe weakness and occasional vomiting since the last 5 days. Clinical examination of the dog revealed rise in body temperature (103.8°F), icteric mucus membranes, increased heart rate (194 bpm) and tachypnoea (56/min) along with respiratory distress. Dog had very scanty urine output during urinary catheterization, with passage of reddish coloured urine and vomited several times during examination. Peripheral Giemsa stained blood smear examination revealed presence of piroplasmic *Babesia canis* organisms in the RBC (Fig. 2) Hematology revealed leucocytosis with decreased haemoglobin, PCV, TEC, thrombocytopenia with increase in serum creatinine, urea, ALT, AST, and total bilirubin (Table 1).

**Treatment & Discussion:** Based on the clinical signs, and laboratory examination, the case was diagnosed as babesiosis in both the dogs. Both the cases were treated with inj. Imidocarbdiopropionate @ 6.6 mg/kg body, two doses, 14days apart subcutaneously and Doxycycline @ 10 mg/kg b.wt orally for 14days. For case-1 ancillary treatment with vitamin B complex inj. @ 2 ml, intramuscularly daily for 2 weeks, inj. Meloxicam @ 0.5 mg/kg body weight for three days and intravenous administration of iron sucrose @ 2.5 ml in 50 ml of NSS on alternate days for four occasions was administered and daily oral supplementation of iron syrup @ 5 ml per day was advised. After completion of two weeks of therapy Case-1 responded favourably and attains its normal activities. For case-2 ancillary treatment with inj. ondansetron @ 2 ml IV, 5% DNS IV @ 15 ml/kg body weight along with above therapy (case-1) was administered. Urinary catheterization also carried out to evacuate urine since the dog was suffering from oliguria. But the dog did not respond to the therapy and died on the 3<sup>rd</sup> day of treatment. Dogs with simple babesiosis (case-1) had fever, anorexia, and weakness; these results are consistent with other research [14]. Clinical signs of more complex form of babesiosis vary depending on the specific issue that arises. Clinical signs and symptoms seen in the current cases include fever, weakness, anorexia, tachycardia, tachypnea, and depression. The clinical signs and symptoms are believed to be the consequence of a systemic inflammatory response syndrome brought on by significant cytokine release and tissue hypoxia that follows anaemia [10]. Acute renal failure (ARF), hepatopathy with noticeable icterus, hypoglycemia, and severe acid-base imbalances with frequent secondary multi-organ failure are among the consequences that can be seen in the severe form of the disease [8]. The worst prognosis is for dogs with haemoconcentrated babesiosis and cases of acute renal failure, acute respiratory distress syndrome, or cerebral babesiosis; in these cases, mortality can reach 100% even with intensive, and sophisticated therapies [16]. When dogs have renal impairment from babesiosis, as in the current case-2, sign of oliguria is an indication of poor prognosis or further deterioration of condition is a warning indication [9]. Present clinical observation was in agreement with the previous reports [12]. Low haemoglobin levels indicate anaemia, which could be caused by haemoglobin loss owing to RBC rupture in dogs [7, 15]. The common abnormality in the investigated parameters was thrombocytopenia. The mechanisms of the thrombocytopenia are not yet fully understood in babesiosis [2]. *Babesia* initiates a mechanism of antibody-mediated cytotoxic destruction of circulating

erythrocytes. Auto-antibodies are directed against components of the membranes of infected and uninfected erythrocytes. This causes intravascular and extravascular haemolysis, which leads to anaemia. Previously it was recorded the anaemia in 74% of dogs with babesiosis and in all the cases anaemia was normocytic and normochromic [3]. The current communication showed an increased amount of bilirubin and increased ALT, AST activity which could be caused by inflammatory cytokines or hypoxia that causes liver/muscle damage [4]. The high creatinine and urea were most likely related to babesiosis associated renal cell damage due to the development of refractory hypotension, resulting in decreased renal tissue perfusion and glomerular filtration rate [15, 17]. Diagnosis of *Babesia* was done on the basis of peripheral blood smear examination following similar procedure used for diagnosis of blood parasite in different animals as described previously [13]. The treatment of babesiosis in dogs requires both specific and supportive/ancillary 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. Dogs with babesiosis treated with imidocarbdiopropionate and doxycycline was found to be suitable [1, 11, 14]. In dogs affected with babesiosis, early diagnosis and appropriate treatment results in good prognosis, but severely affected or untreated animals may succumb to disease as was seen in case-2.

**Table 1:** Hemato-biochemical parameters of both the cases affected with babesiosis

Parameters	Case 1	Case 2	Normal range
Hemoglobin (g/dl)	7.8	6.9	10-18
TEC ( $10^6/\text{mm}^3$ )	4.8	4.2	5.5-8.5
PCV (%)	22.9	20.3	35-55
TLC ( $10^3/\text{mm}^3$ )	18.2	20.41	6-17
Platelets ( $10^5/\text{mm}^3$ )	112	98	120-600
Creatinine (mg/dl)	1.8	2.9	0.5-1.5
Urea (mg/dl)	68	97	18-55
Total bilirubin (mg/dl)	0.6	0.8	0-0.5
AST (U/L)	72	110	9-49
ALT (U/L)	75	93	8-57



**Fig 1:** Microscopic view of *Babesia canis* in RBCs of the infected dog (case 1)



**Fig 2:** Microscopic view of *Babesia canis* in RBCs of the infected dog (case 2)

### Conclusion

Current treatment strategies for babesiosis often ameliorate the clinical signs of infection, but these hemoparasites are seldom completely eliminated, and when immunocompromised, recrudescence may occur. So, owners should be advised for proper control of the ticks by using anti-tick spray/spot on preparation and regular grooming of their pets to prevent recurrence and spread of infection.

### Reference

1. Birkenheuer AJ, Levy MG, Savary KC, Gager RB, Breitschwerdt EB. *Babesia gibsoni* infections in dogs from North Carolina. *J Am. Anim. Hosp. Assoc.* 1999;35:125-128.
2. Boozer AL, Macintir DK. Canine babesiosis. *Vet. Clin. N. Amer. Small Anim. Pract.* 2003;33:885-904.
3. Furlanello T, Fiorio F, Caldin M, Lubas G, Solano Gallego L. Clinico pathological findings in naturally occurring cases of babesiosis caused by large form *Babesia* from dogs of Italy. *Vet. Parasitol.* 2005;134:77-85.
4. Gonde S, Chhabra S, Uppal SK, Singla LD, Randhawa SS. A unique case of *Babesia gibsoni* infected dog with paraplegia. *Journal of Parasitic Diseases.* 2016;40(4):1605-1608.
5. Irwin PJ. Canine Babesiosis. *Vet. Clin. Small Animal* 2010;40:1141-1156.
6. Keller N, Jacobson LS, Thompson PN, Schoeman JP. Prevalence and risk factors of hypoglycemia in virulent canine babesiosis. *Journal of Veterinary Internal Medicine.* 2004;18:265-270.
7. Kshama MA, Mamatha GS, Puttalakshamma GC. Successful Treatment of *Babesia gibsoni* infection in a Splenectomized dog. *Intas Polivet.* 2017;18(1):183-184.
8. Leisewitz AL, Jacobson LS, De Morais HS, Reyers F. The mixed acid-base disturbances of severe canine babesiosis. *Journal of Veterinary Internal Medicine.* 2001;15:445-452.

9. Lobetti RG. Babesiosis, Infectious diseases of the dog and cat, 3rd ed., edited by C.E. Greene. Philadelphia: W.B. Saunders; c2006.
10. Lobetti RG, Jacobson LS. *Journal of the South African Veterinary Association.* 2001;72:23-28.
11. Patowary P, Phukan A, Dutta TC, Baishya BC, *et al.* Successful clinical management of canine babesiosis: A case report. *The Pharma Innovation Journal.* 2022;11(3):185-187.
12. Reddy BS, Kumari KN, Sivajothi S. *Comp Clin Pathol.* 2014. DOI 10.1007/s00580-014-1893-y.
13. Sivajothi S, Rayulu VC, Malakondaiah P, Sreenivasulu D. *International Journal of Livestock Research.* 2013;3(3):48-56.
14. Taboada J, Babesiosis. *Infectious Diseases of the Dog and Cat.* Greene, C. (Ed.), WB Saunders, Philadelphia; c1998. p. 473-481.
15. Venkatesakumar E, Kumar V, Ramprabhu R. Diagnosis and Management of Concurrent Ehrlichiosis and Babesiosis in a Dog. *Intas Polivet.* 2018;19(2):267-268.
16. WelzIC, Leisewitz AL, Jacobson LS, Vaughanscott T, Myburgh E. *Journal of the South African Veterinary Association.* 2001;72:158-162.
17. Zygner, Wedrychowicz. Influence of anemia on azotemia in dos infected with babesiosis in Poland. *Bulletin-veterinary institute in pulawy.* 2009;53(4):663-668.