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Rare incidence of Babesiosis in a calf and its therapeutic management: A case report

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Abstract

The present study is on a rare incidence of babesiosis in a four month old calf, as the disease is more common in adults due to inverse age resistance. The calf was presented with a history of coffee coloured urine and anorexia. On clinical examination, mild icteric mucous membrane enlarged superficial lymph node and tick infestation were observed. Hematological parameters revealed an anaemic blood picture and piroplasms of *Babesia bigemina* were identified by microscopical examination of peripheral blood smear. The calf was successfully treated with diminazene aceturate, oxytetracycline along with supportive therapy and oral hematinics. The animal showed improvement within three days of therapy and had an uneventful recovery after two weeks.

Keywords: *Babesia bigemina*, calf, hemoglobinuria, anaemia, Diminazene aceturate

Introduction

Bovine babesiosis is one of the common tick-borne haemoprotozoal infections in tropical countries, especially in India. Babesiosis is caused by intraerythrocytic protozoan from the genus *Babesia* under the family Babesidae and order Piroplasmida, within the phylum Apicomplexa that infect a wide range of domestic and wild animals and occasionally man. In cattle industry, the most affecting important species are *Babesia bigemina* and *B. bovis* (Bock *et al.* 2004) [1]. The organism multiplies within the erythrocytes of the vertebrate host, asexually producing two or more trophozoites. Infected red blood cells liberate trophozoites, which invade and infect a large number of red blood cells (Soulsby, 1882) [2]. Crossbred cattle show higher susceptibility than zebu cattle and buffaloes, which mainly act as carriers (Jithendran *et al.* 1997) [3]. The clinical form of the disease is characterized by anemia, fever, hemoglobinuria, and even death in some cases. (Sharma *et al.* 2013) [4].

As quick and cheap, Leishman / Geims stained thin blood smear by microscopic examination of *Babesia* piroplasms is a gold standard test, however, it has low sensitivity and usually fails to detect carrier animals been a demerits (Criado-Fornelio *et al.* 2009) [5]. Though the incidence of the disease is rare in calves up to 9-12 months of age due to inverse age resistance, clinical cases of babesiosis have also been reported in neonatal calves (Venu *et al.* 2015; Rajeev Kumar *et al.* 2018) [8, 6]. This paper presents the rare case of *Babesia bigemina* in a male calf, its identification and successful therapeutic management.

History and clinical observation

A four month old HF cross male calf was presented with the history of anorexia and coffee coloured urine (Fig.1) for the past one day. On Clinical examination, mild icteric mucous membrane and enlarged superficial lymph node along with tick infestation were observed. Temperature and respiration rate were within the normal range, whereas heart rate was mildly elevated. Whole blood, clotted blood and peripheral blood smear were collected for hematological, serological and haemoprotozoan examination respectively. The haematological and biochemical findings were listed in Table 1. The peripheral blood smear stained with Leishman stain on examination under oil immersion confirmed the presence of *B. bigemina* (Fig.2a & 2b) as described by Soulsby (1982) [2].

Treatment and Discussion

The calf was treated with Diminazene aceturate @3.5 mg/kg body weight and three dose of long acting Oxytetracycline @20mg/kg body weight as deep intramuscular injections.

Ivermectin was used for the control of endo and ectoparasites at the dose rate 0.2mg/kg subcutaneously. Supportive medication with Phenylbutazone @4mg/kg, Tribivet @5ml/kg and Chlorphenaramine maleate @0.5mg/kg intramuscularly for five days along with oral haematinics (Syrup aRBCe RAKKT @ 15ml/ day). After one week of the treatment, the calf became clinically normal with the absence of organism on peripheral blood smear screening.

A strong innate immunity exhibited in young calves compared to adult cattle. There is an age-related immunity towards primary infection of cattle with babesiosis (Goff *et al.* 2001)^[13], and the infected calves do not develop the severe form of the disease (Zintl *et al.* 2005)^[12]. However *Babesia bigemina* infection in young calves was reported rarely in India (Karunakaran *et al.* 2011; Venu *et al.* 2015)^[7,8].

The haematological alterations in the present case were due to intense hemolysis by the intraerythrocytic *Babesia spp.*, resulted in the clinical symptoms of haemoglobinuria, anaemia and also elevated heart rate as a compensatory mechanism and this result was in agreement with Constable *et al.* 2017^[9]. The serum total protein and albumin were found to be lower in affected calf. Similar finding was reported by Aziz *et al.* 2020^[14] and it might be due to acute phase of the disease, prolonged insufficient caloric intake or decreased hepatic protein synthesis by affected animal (Talkhan *et al.* 2010)^[15].

The present case in a four month old calf with clinical symptoms, was successfully treated with diminazene aceturate, oxytetracycline along with supportive therapy and oral hematinics in similar with the findings of Karunakaran *et al.* 2011^[7]; Bal *et al.* 2016^[10]; Dinesh, 2021^[11].

In conclusion, the rare incidence of babesiosis in calves related to colostrum-derived antibodies and high levels of tick transmission and responded to diminazene aceturate, oxytetracycline therapy. In order to control babesiosis, proper management and rotational use of acaricides drugs are the essential keys.

Table 1: Haemato – Biochemical Parameters

Parameters	Young calf	Range (Units)
Haemoglobin	3.1	8.5–12.2g/dl
PCV	9.4	22–33%
RBC	2.11	5.1–7.6 million/ μ L
WBC	13000	4900–12000
Neutrophils	36	30–40%
Lymphocytes	63	50–60%
Total Protein	4.6	6.76–7.46 g/dl
Albumin	2.8	3–3.6 g/dl
AST	114	78–132 IU/dl
ALP	174	0–488 IU/dl
Glucose	52	45–75 mg/dl
Phosphorous	5.3	5.6–6.5 mg/dl



Fig 1: Haemoglobinuria in an affected calf

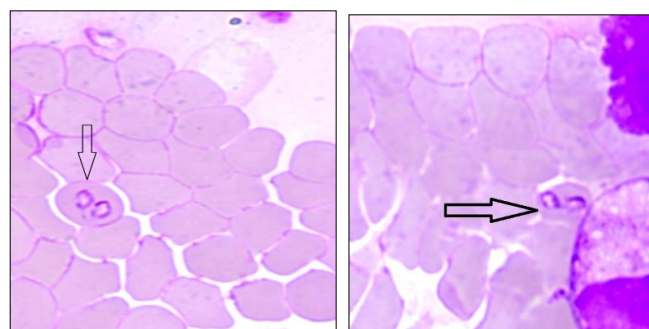


Fig 2a and 2b: *Babesia bigemina*

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