



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2021; 9(1): 1899-1900

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Received: 10-11-2020

Accepted: 12-12-2020

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Intra uterine infection of *Babesia* organisms in a new-born calf

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Abstract

Among the various species of *Babesia*, Bovine babesiosis is mainly caused by *Babesia bigemina* and *Babesia bovis*. *Babesia* species are mainly transmitted by ticks and generally young calves immune to *Babesia* infection. In this case report, babesiosis was diagnosed in 5-days old Holstein- Friesian calf based on clinical signs, blood smear and haematological examination. Calf showed clinical signs of dull, depressed, high fever (106.2⁰F), congested mucous membrane, increased respiratory and heart rate with thumping sound, haemoglobinuria and profuse diarrhoea. The peripheral blood smear revealed the presence of usually paired *Babesia* organisms inside erythrocytes. Haematological study revealed reduced Hb level (4.6 gm %). Microscopic blood smear examination of the mother cow also revealed less than one percent of the erythrocytes were infected with *Babesia* parasites. Calf was treated with a single dose of Diminazene aceturate @ 3.5 mg/kg body weight deep intramuscular route along with supportive therapy consisting of antipyretic, antihistaminic and antidiarrhoeal. This is a rare report of intrauterine infection of Babesiosis in a new-born calf.

Keywords: babesiosis, new-born calf, intrauterine, haemtological profile, haemoglobinuria

Introduction

Babesiosis is caused by Genus *Babesia* is considered to be one of the most important haemoprotozoal diseases of livestock in India especially in exotic and cross bred dairy animals and cause severe economic losses to farmers both in exotic and crossbred dairy animals as high mortality. Since, there is age reverse immunity in babesiosis, the disease is less common in young calves. Most of the clinical cases of babesiosis occur in adult animals that are more susceptible to the disease. Clinically, it is characterized by high fever, haemoglobinuria, profuse diarrhea or constipation and anemia. Once the animal has recovered from the infection it becomes refractory to re-infection with the homologous strain due to the continual presence of the infection which confers preimmunity on the animal. Transmission of the disease is through the bite of *Boophilus microplus* in which transovarian transmission of the parasite occurs. Intrauterine transmission of *Babesia* parasite in calves seems to be very rare and accidental, probably requiring some pathological changes in the placenta ^[1-3]. However, Babesiosis in 42- day- old calf has been documented ^[4]. The present communication reports the rare incidence of babesiosis in a 5-day old female calf which occurred transplacentally.

Case History and Observations

A 5-day old Holstein-Friesian calf born from a crossbred H.F. cow of the second lactation was attended during a private visit in Amnaur Village of Saran District of Bihar, with the history of, stopped suckling, fever, passing coffee coloured urine and watery diarrhea. Clinical examination revealed that the animals had to have high fever (106.2⁰F), congested mucous membrane. The animal was dull, depressed and there was increased respiratory and heart rate with thumping sound. The animal passed coffee coloured urine and having profuse diarrhea. Based on history and clinical examination, a thin blood smear was prepared from the ear vein and blood sample was collected in a vial containing EDTA for haematological study.

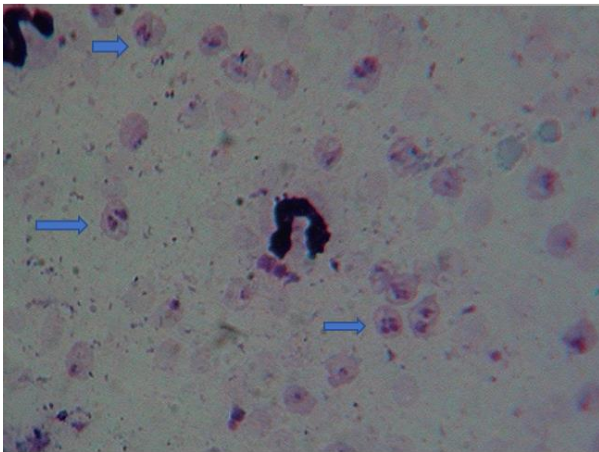
Results and Discussion

Blood smear examination and haematological studies were carried out at the Department of Veterinary Parasitology, Bihar Veterinary College, Patna. Examination of blood smear revealed that 40 percent of the Red Blood Cells were infected with *Babesia* organisms. A typical pear shaped organism was found in most of the infected erythrocytes.

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The Haematological study revealed very low haemoglobin content (4.6 gm %) of the blood. The total leucocyte count (TLC) count was 8650/ μ l of blood and the differential leucocyte count was almost normal with a minor increase in the neutrophil value (Neutrophils 49%, Lymphocyte 40%, Monocyte 5% and Eosinophil 6%). On the basis of microscopic examination and clinico-haematological observation, the disease was diagnosed a babesiosis. Immediately the case was diagnosed and the calf was treated with Diminazene acturate @ 3.5 mg/kg body weight deep intramuscular route along with supportive therapy consisting of antipyretic, antihistaminic and antidiarrhoeal. The calf did not respond to treatment and died after three hours. This might be due to flash killing of several organisms in a single full dose of Diminazene acetate which leads to obstruction in blood flow in blood vessels. Looking in to the typical nature of the case the blood smear of the mother cow was also collected and on examination it was observed that less than one percent of the erythrocytes were infected with *Babesia* parasites.



Babesia organisms inside Red Blood Cells

Indigenous breed (*Bos indicus*) is more resistant to the infection than the exotic breed (*Bos taurus*)^[5]. It has been observed that the young calves are more resistant to the disease than the adults. The possible transfer of maternal antibodies via colostrums is probably responsible for this resistance^[6]. However, there are few reports of fatal infection in new born calves^[7]. The development of babesiosis in calves, born of non-immune parents, when they were inoculated with infective blood or exposed to infected ticks at 12-55 days of age^[8]. In the present study after analyzing the possible aspect of the disease, it was observed that the calf was anorexic since birth which prevented it from suckling colostrum from the mother. As the investigation showed that the mother cow was carrying a subclinical infection of babesiosis, the colostrums must have antibabesial antibodies as the calf was anorexic. It is therefore concluded that the new born calf which picked up infection from its mother through intrauterine route suffered from clinical babesiosis. The severe anemia detected in the calf is due to erythrocytic destruction and resembles uncomplicated haemolytic anemia^[9] which led to haemoglobinuria and thumping hear sound may be due to low volume of blood and cardiac palpitation.

Conclusion

In this study, the 5- day old calf might have got the *Babesia* organisms infection through transplacental a route as mother

cow was a subclinical infection of babesiosis. This rare report of intrauterine infection of Babesiosis in a new-born calf may be documented.

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