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Detection and treatment of babesiosis in crossbred cow

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Abstract

The present study was carried out in a 5 year old, female, Holstein Friesian cow that was presented with fever, paleness of mucous membranes, dyspnoea and coffee colored urine. Peripheral blood samples from ear vein and whole blood samples from jugular vein were collected for thin blood smear examination and haematology. Ticks present on the animal were collected for identification of vector. Results revealed piroplasms of *Babesia* in erythrocytes by giemsa staining of thin blood smear. Haematology showed significant decrease in Haemoglobin (Hb), Packed Cell Volume (PCV) and Total Erythrocyte Count (TEC). The ticks were identified as *Rhipicephalus* spp.

Keywords: Babesiosis, crossbred cow, vector tick, Haemoglobinuria

Introduction

Babesiosis is a tick transmitted disease caused by intraerythrocytic protozoan parasite of genus *Babesia*. *Babesia* is infecting wide range of domestic and wild animals and some species have zoonotic importance [15]. Disease has been characterized by anaemia, fever and haemoglobinuria [13]. Southern cattle tick *Rhipicephalus microplus* acts as vector for protozoan agent of cattle fever *Babesia bigemina* [3]. *Babesia bovis* and *B. bigemina* are the most prevalent species which are found in most of the tropical and subtropical regions, due to the universal distribution of the ixodid tick that acts as vector [2]. Tick borne diseases cause major losses to livestock industry throughout the world [1]. The disease is commonly seen in crossbred cattle under stress [9]. Acute phase of disease is seen when the tick population is high leading to death in few days and PCV counts falling below 20 percent [14].

In India Babesiosis and anaplasmosis cause losses of about 57.2 million US dollars annually [7]. Detection and treatment of babesiosis is primary in controlling the disease, conventional methods like microscopy are cheapest and fastest methods to identify *Babesia* parasites in blood smears apart from their limited sensitivity and specificity [8].

Case History

A 5-year-old, female, crossbred Holstein Friesian cow was presented with fever, paleness of mucous membranes, dyspnoea and coffee colored urine for 2 days. Clinical examination revealed elevated temperature of about 105⁰ F, increased heart rate, dyspnoea, reduced appetite with tick infestation on the body. At Peripheral blood smears from ear vein and whole blood samples were collected for giemsa staining and haematological study.

Treatment

Based on examination of *Babesia* in blood smears and the symptoms exhibited the animal was treated with Diminazene aceturate (Inj. Berenil RTU, Hoechst®) @3.5 mg/kg b.wt I/M and Melonex 20ml intramuscularly for 3 days. Supportive therapy was given by administering 5 percent dextrose normal saline intravenously for 4 days and haematonic (Inj. Feritas, Intas Pharmaceuticals) given @ 10ml intramuscularly for 5 days.

Material and Methods

Peripheral blood collected from ear veins were made into thin smears and fixed in methanol. The smears were giemsa stained at 1 in 10 dilution for 30 minutes and examined under oil immersion objective of microscope.

Whole blood samples were collected from jugular vein in EDTA coated vacutainers for haematological analysis. Blood samples were evaluated for various haematological parameters.

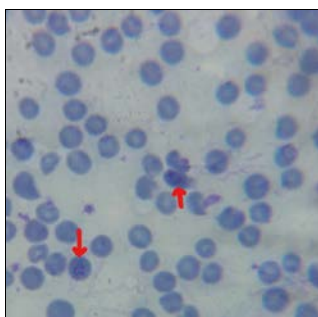


Fig 1: Pyriform stages of *Babesia* in red blood cells

Table 1: Haematological values of affected cow

Blood Parameter	Values
Total Erythrocyte Count ($\times 10^6/\mu\text{L}$)	3.0
Haemoglobin (g/dL)	4.0
Packed Cell Volume (%)	13.0
Mean Corpuscular Volume (fL)	35.6
Mean Corpuscular Haemoglobin (Pg)	10.52
Mean Corpuscular Haemoglobin Concentration (g/dL)	21.40
Total Leukocyte Count ($\times 10^3/\mu\text{L}$)	14.0
Neutrophils (%)	38
Lymphocytes (%)	58
Monocytes (%)	2
Eosinophils (%)	2
Basophils (%)	-

Results and Discussion

Giemsa stained thin blood smears revealed pyriform developing stages of *Babesia*. Haematological results showed low levels of Haemoglobin (Hb), Packed Cell Volume (PCV) and Total Erythrocyte Count (TEC). Post treatment, clinical and haematological values came back to normal when analysed after 3 days of treatment. Finding of *Babesia* in the current investigation is consistent with earlier reports that stated, the susceptibility of adult cattle to babesiosis [1]. The clinical signs observed with babesiosis such as fever, coffee colored urine and pale mucous membranes were supported by some studies [8]. Haematological findings in the present study were in accordance with findings [4] that reported Lymphocytosis and monocytosis after haemolytic crisis. Ruptured red blood cells stimulating significant increase in the lymphocyte and monocytic count [1] that aid in cleaning toxic remnants of haemolysis was supported by studies that [5] stated that infections of *Babesia* will lead to stimulation of body defense mechanisms. Previous studies [12] opined that decrease in haemoglobin (Hb), packed cell volume (PCV), differential leukocyte count (DLC), total leukocyte count (TLC) and total erythrocytic count (TEC) might be due to intravascular haemolysis which were consistent with haematological values in current investigation. Studies suggested *R. microplus* to be the predominant tick responsible for transmission of *Babesia* which was identified in the present study [6].

Conclusion

From the findings of present study, it can be concluded that the observed changes in haematological values in *Babesia* infected crossbred cow helps in understanding the disease prognosis and corrective measures for supportive therapy. The

conventional method of detecting parasitic stages in giemsa stained thin blood smears can reliably be used to diagnose the disease in acute stage and is so far the fastest and cheapest method that can be used in field conditions.

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