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Short Communication

Prevalence and hematological changes associated with *Babesia bigemina* in crossbred cattle of West Tripura District

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Abstract

A total of 282 suspected blood samples were screened using Giemsa stain from January 1, 2014 to January 1, 2019 for blood parasite infections in cross bred cattle infested with ticks, between 6 months to 10 years with clinical symptoms such as anorexia, pyrexia, enlarged superficial lymph nodes, pale conjuctival mucus membrane, hemoglobinuria, nasal discharge and grinding of teeth. Out of 282 suspected blood samples 38 (13.47 %) blood samples were found positive for *Babesia bigemina* infection using Giemsa stain.

Keywords: *Babesia bigemina,* Crossbred cattle, Prevalence, Hematology, West Tripura

Babesiosis is a hemoprotozoan disease of wide range of domestic and wild animals, caused by various species of intra-erythrocytic *Babesia*, transmitted by ticks and characterized by high fever, haemolytic anaemia, jaundice and haemoglobinuria. Blood parasites infections especially Babesiosis, Theileriosis, Anaplasmosis and Trypanosomiasis are considered some of the major impediments in the health and productive performance of the cattle (Rajput *et al*., 2005). Babesiosis has got a serious economic impact due to obvious reason of death, decreased production and lowered working efficiency (Chawdhury *et al*., 2006). Most of the blood parasites are tick borne and is of great economic importance in Asia and has always been a formidable barrier to the survival of exotic and crossbred cattle in India. Present study was undertaken to know the prevalence of blood parasites in crossbred cattle in West Tripura district of Tripura.

Materials and Methods

A total of 282 suspected blood samples were screened from January 1, 2014 to January 1, 2019 for blood parasites infections in crossbred cattle infected with ticks, between age group of 6 months to 10 years with clinical symptoms such as inappetance to anorexia, pyrexia, enlarged superficial lymph nodes, pale conjuctival mucus membrane, haemoglobinuria, nasal discharge and grinding of teeth.

Blood samples were collected in EDTA vials from all 282 crossbred suspected cattle and 6 apparently healthy animals, and were examined on the same day by Giemsa's stained blood smear. The hematological parameters such as hemoglobin, total erythrocyte count and packed cell volume were recorded using Vet Haematology Analyser.

The Babesia positive cases were treated with diminazene aceturate (Nilbery®) @ 3.5 mg/kg body weight IM as single dose, besides symptomatic treatment for fever with inj Meloxicam paracetamol combination (Melonex plus®) @ 1 ml/15 kg b. wt IM and inj. Iron preparation (Feritas®) @ 1ml/50 kg b wt. IM at 3 days intervals for 3-4 occasions given only in anemic animals.

Results and Discussion

Most common clinical signs observed were anorexia or inappetence (38/38), pyrexia (32/38), enlarged superficial lymph nodes (1/38), pale conjuctival mucus membrane (8/38) (Fig 1), haemoglobinuria (24/38) (Fig 3), nasal discharge (8/38), teeth grinding (3/38) and ticks over the body (35/38) (Fig 3). In the present study, clinical signs of fever may be due to release of inflammatory byproducts while pale mucous membrane and haemoglobinuria may be associated with haemolytic anaemia.

Among 282 cattle screened by Giemsa's stained blood smear examination, 38 (13.47%) were found positive for *Babesia bigemina* parasites. Our findings are in accordance with Banerjee et al., (1983) who reported 14.53 per cent occurrence while our findings are higher than previously reported by Ibrahim *et al.* (2012) 8.8 % and Alim *et al*. (2012) 9.25 % in crossbred and indigenous cattle, respectively. Out of 473 blood smears, 74 (15.65%) samples were reported positive for *Babesia* spp by Bhatnagar *et al*. (2015).

Haematological values in *Babesia* spp infected

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Table 1: Haematological changes associated with *Babesia bigemina* infection in crossbred cattle in West Tripura

Parameters	Healthy animals (Mean±SD) (n=6)	Diseased Animal (Mean±SD) (n=38)
Haemoglobin (gm/dl)	9.63±1.21	7.51±0.61*
TEC (x106/µl)	6.72±0.9	5.17±1.01*
PCV (%)	33.63±4.33	23.78±2.59*
MCH (pg)	15.06±1.35	12.17±2.12
MCV (fL)	52.67±4.50	36.13±8.10
MCHC (g/dl)	28.6±0.9	23.1±0.43
TLC (x10^3//µl)	9.43±1.91	15.32±1.86*
Lymphocytes (%)	55.18±7.49	61.10±4.31
Neutrophils (%)	42.50±2.59	36.08±4.33
Monocytes (%)	1.17±0.75	1.21±0.52
Eosinophils (%)	0.82±0.41	1.31±0.75
Basophils (%)	0.33±0.50	0.3±0.52

*P<0.05

crossbred cattle revealed significantly (p<0.05) lower values of haemoglobin, PCV and TEC and significantly (p<0.05) higher values of TLC than healthy crossbred cattle (Table 1). The clinical signs of haemoglobinuria occur at the peak of haemolytic crisis and may lead to decreased values of Hb, PCV, TEC and immediately after haemolytic crisis, a brief lymphocytosis and monocytosis combine to cause leukocytosis (Gungi *et al.,* 2016).

The Diminazene aceturate is an anti-babesial drug used against *Babesia bigemina* infection where as non-steroidal anti-inflammatory drug was used to overcome pyrexia while iron-sorbitol preparation was given to improve the decreased haemoglobin level associated with babesioisis in cattle (Tuvshintulga, *et al.,* 2019). Babesiosis cases showed good response to Diminazene aceturate along with supportive therapy and recovered completely except for one which died due to severe anaemia. In conclusion, a total of 13.47 % prevalence of *Babesia bigemina* was observed in suspected blood samples of crossbred cattle in West Tripura district of Tripura observed.

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