CASE REPORT

Therapeutic Management of Babesiosis in a Cow: A Case Report

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Babesiosis is a haemoprotozoan disease caused by intraerythrocytic protozoan parasites of the genus Babesia that infect a wide range of domestic and wild animals. It is one of the common tick borne haemoprotozoan diseases affecting the bovines in tropical and subtropical parts of Africa, Australia, America, and Asia including India (Kumar and Kala, 2018). In India, annual economic losses to livestock due to babesiosis are estimated to be about 57.2 million US dollars which is mainly caused by two most important species, *i.e., Babesia bovis* and *Babesia bigemina* (Bock *et al*., 2004). The cattle tick *Rhipicephalus microplus* is the main vector involved with the transmission and is the only known vector for bovine babesiosis (Souza *et al.,* 2018). Due to universal distribution of the ixodid tick, babesiosis is considered as the second most widespread blood-borne disease of animals (Homer *et al.,* 2000) and is prominently gaining increasing interest as an emerging zoonosis of humans also (Homer *et al.,* 2000; Zintl *et al.,* 2003). Clinical symptoms of Babesiosis are classical haemoglobinuria which is often present, with anaemia and jaundice that develops especially in more protracted cases (Bock *et al.,* 2004). The disease has been recorded in all the cattle breeds but more commonly in exotic and crossbred cattle than in indigenous ones (Chakrabarti, 2003). The present communication describes the haemato-biochemical profile and therapeutic management of a non-descript native cow with babesiosis infection.

Case History and Observations

A 3 years old non-descript cow was reported with the history of fever, anorexia, passing coffee coloured urine, reduced milk production in weak and lethargic condition at Santer village of Mhow (India) during screening. The cow was clinically examined. An elevated rectal temperature (105.2°F), accelerated heart rate and respiration, pale and icteric mucous membrane, coffee coloured urine and moderate tick infestation were observed.

For haemoprotozoan test 1 mL blood sample was collected from ear vein. Thin blood smear prepared, air dried, fixed with methanol, stained with Giemsa stain and examined under oil immersion (100X) revealed the presence of piroplasmic organisms (pear-shaped bodies joined at an acute angle) of babesia within 45% erythrocytes (Fig. 1).

Whole blood sample was collected from jugular vein in a vial containing EDTA for haematological studies and serum was separated from the blood collected in vial without EDTA and was used for biochemical analysis. The findings are presented in Table 1. The haemogram revealed the severe reduction in Hb, PCV, TEC and MCV indicative of haemolytic anaemia with elevated serum AST, ALT, bilirubin, BUN and creatinine generally observed in animals with babesiosis (Bal *et al*., 2016).

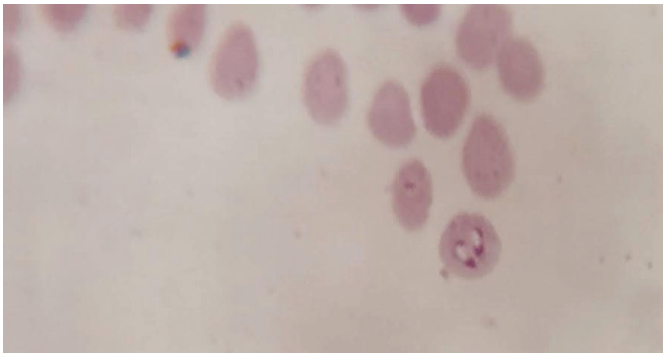

Fig. 1: A typically paired pyriform *Babesia bigemina* piroplasm with acute angle within the erythrocyte of Giemsa stained blood smear.

For molecular detection SpeI-AvaI restriction fragment of *Babesia bigemina* (278 bp) was amplified by PCR using the *Babesia bigemina* specific published primers sequence- Forward 5′-CAT CTAATT TCT CTC CATACCCCTCC-3′ ; Reverse

5′-CCT CGG CTT CAA CTC TGA TGC CAAAG-3′ (Figueroa *et al.,* 1992). Specific primer directed amplification of PCR assay revealed the amplicon at 278 bp in 1.2% agarose gel corresponding to *Babesia bigemina* (Fig. 2). Species specific identification was difficult on the basis of smear examination. PCR has proven to be very sensitive particularly in detecting *Babesia* spp. in carrier cattle (Liu *et al.,* 2014).

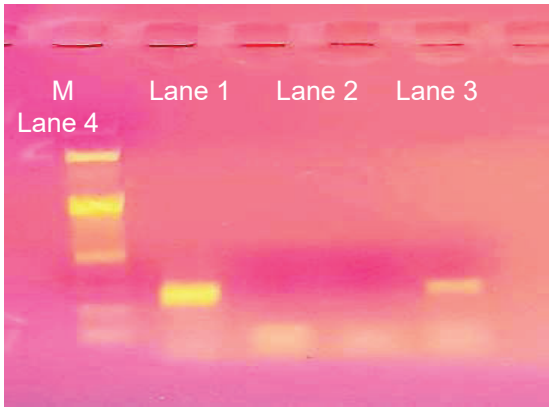

Fig. 2: Agarose gel (1.2%) electrophoresis showing amplified DNA from *Babesia bigemina* (278 bp), M: Molecular marker 100 bp DNA Ladder, Lane 1: Amplification of babesia genomic DNA- Positive control, Lane 2: Negative control, Lane 3: Healthy Control, Lane 4: infected cow under study.

Treatment and Discussion

The cow was treated with a single dose of Diminazine aceturate (Inj. Berenil RTU, Hoechst®) 3.5 mg/kg body weight intramuscularly (Maharana *et al.,* 2018). For supportive therapy anti-inflammatory (Inj, Meloxicam, Intas Pharma @ 0.2-0.5 mg/kg b.wt., IM), antihistamine (Inj. Chlorapheniramine maleate, Alembic Pharmaceutical Ltd. @ 0.5 mg/kg b.wt.,, IM) and fluid therapy for three days and haemantinics (Inj. Feritas Intas Pharmaceuticals® @ 1 mL/50 kg b.wt., IM once in 2 days) were given.

Most of the clinico-haematological findings of babesiosis found in our case were similar to those reported earlier by Kumar and Kala (2018). A marked improvement in the clinical parameters; along with normal rectal temperature (101°F), heart rate and respiration rate were noticed on 3rd day post-treatment. Similar to our findings Laha *et al.* (2012) reported decreased milk production that recovered after 2 weeks of treatment with Diaminazine acetutrate. In babesiosis, anaemia develops due to destruction of RBCs by parasitic load and reduction in erythrogenesis with increase in neutrophils (Maharana *et al*., 2018).

The observations on biochemical profile were in accordance with the previous reports of Esmaeilnejad *et al*. (2012) resulted from kidney dysfunction and muscle catabolism. Elevated values of haemato-biochemical parameters were in normal range after treatment.

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Table 1: Haemato-biochemical values of cow affected with Babesiosis

Parameters	Reference Values*	Pre treatment Values	3rd day Post- treatment	7th day Post- treatment
Hemoglobin (g/dL)	8–15	5.1	6.8	8.1
PCV (%)	24–46	14.32	18.75	24.68
TEC (X 10^6/µL)	5.0–10.0	3.97	4.88	5.97
TLC (×10^3/µL)	4-12	8.05	7.38	6.78
MCV (fL)	40–60	36.07	38.4	41.3
MCHC (g/dL)	30–36	35.61	36.26	32.82
Neutrophils (%)	15–33	36	35	34
Lymphocytes (%)	45–75	59	60	61
Monocytes (%)	0–8	1	1	1
Eosinophils (%)	0–20	4	4	4
AST (U/L)	78-132	145.24	139.46	130.41
ALT(U/L)	11-40	53.61	52.96	47.62
Creatinine (mg/dL)	1.0–2.0	2.1	1.8	1.5
Bilirubin(mg/dL)	0.01-0.5	2.38	2.08	0.56
BUN (mg/ dL)	20-30	32.91	29.13	14.2

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ANNOUNCEMENT

X Annual Convention and National Symposium of SVSBT-2023

Extension of Date of Abstract Submission

This is to inform that on request from many participants, the last date of submission of Abstract through **e-mail svsbt2023@gmail.com is extended till 23rd September, 2023 for presentation in the *X Annual Convention*** of the Society for Veterinary Science & Biotechnology ***(SVSBT)*** and ***National Symposium on "Recent Biotechnological Advances in Health and Management of Livestock, Poultry and* Companion Animals"** to be Hosted by College of Veterinary Science & Animal Husbandry (NDVSU, Jabalpur), **Mhow, Indore, M.P. during 5th to 7th October, 2023**. The other details floated in Brochure cum Invitation remain unchanged. The abstracts received **after 23rd September, 2023 will not be entertained**.

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