Therapeutic Management of Babesiosis in a Cow: A Case Report

Shivani Bante1*, Rajendra Kumar Bagherwal1, Vivek Agrawal2, Shweta Rajoriya3


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).

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

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).

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S’-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).

**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 aceturate. 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 haemat-biochemical parameters were in normal range after treatment.

**ACKNOWLEDGEMENT**

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**REFERENCES**


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

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Reference Values*</th>
<th>Pre treatment Values</th>
<th>3rd day Post- treatment</th>
<th>7th day Post- treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>8-15</td>
<td>5.1</td>
<td>6.8</td>
<td>8.1</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>24-46</td>
<td>14.32</td>
<td>18.75</td>
<td>24.68</td>
</tr>
<tr>
<td>TEC (X 10^6/μL)</td>
<td>5.0-10.0</td>
<td>3.97</td>
<td>4.88</td>
<td>5.97</td>
</tr>
<tr>
<td>TLC (X10^3/μL)</td>
<td>4-12</td>
<td>8.05</td>
<td>7.38</td>
<td>6.78</td>
</tr>
<tr>
<td>MCV (fl)</td>
<td>40-60</td>
<td>36.07</td>
<td>38.4</td>
<td>41.3</td>
</tr>
<tr>
<td>MCHC (g/dL)</td>
<td>30-36</td>
<td>35.61</td>
<td>36.26</td>
<td>32.82</td>
</tr>
<tr>
<td>Neutrophils (%)</td>
<td>15-33</td>
<td>36</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>Lymphocytes (%)</td>
<td>45-75</td>
<td>59</td>
<td>60</td>
<td>61</td>
</tr>
<tr>
<td>Monocytes (%)</td>
<td>0-8</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Eosinophils (%)</td>
<td>0-20</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>78-132</td>
<td>145.24</td>
<td>139.46</td>
<td>130.41</td>
</tr>
<tr>
<td>ALT(U/L)</td>
<td>11-40</td>
<td>53.61</td>
<td>52.96</td>
<td>47.62</td>
</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>1.0-2.0</td>
<td>2.1</td>
<td>1.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Bilirubin(mg/dL)</td>
<td>0.01-0.5</td>
<td>2.38</td>
<td>2.08</td>
<td>0.56</td>
</tr>
<tr>
<td>BUN (mg/ dL)</td>
<td>20-30</td>
<td>32.91</td>
<td>29.13</td>
<td>14.2</td>
</tr>
</tbody>
</table>

*Kaneko et al. (2008)


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.

For Further details, please contact:

Dr. R.K. Bagherwal and Dr. B.P. Shukla
Organizing Secretaries,
College of Veterinary Science & Animal Husbandry, Mhow, Indore (MP), India
Whatsapp No.: 9589387634 (RKB), 9826298323 (BPS).