A clinico pathological and therapeutic report on Babesiosis in buffaloes

P Ramadevi, KV Ramakrishna and Vijayabhaskar

Abstract
Clinico pathological and therapeutic aspects of Babesiosis in two graded Murrah buffaloes were described. The animals were reported to Veterinary Hospital Eluru, West Godavari district, Andhra Pradesh, India during June-July 2017. Pyrexia (103.8°F) anorexia, hemoglobinuria, poor body condition scores and dehydration were prominent clinical signs and ataxia and staggering gait were also observed. Intra erythrocytic Babesia bigemina organisms could be found in peripheral blood smear. Hematological examination revealed anemia (Hb 6.1 & 2.7g/dl; low RBC 3.47X10*6/µl & 1.1X10*6 µl; PCV 20% & 10.7%) thrombocytopenia, lymphocytosis, monocytosis, elevated hepatic enzymes, (AST 165.6 & 286 IU/L) creatinine (2.5 & 4.6mg/dl), hypoalbuminemia (2.5 & 2.1g/dl) and hypocalcemia (8.66 & 7.65mg/dl). Both the animals were treated with diamenzene @3.5 mg/kg, along with intensive support therapy. Buffalo 1 recovered with regressed parasitemia within 24hrs and urine color became normal in 48 hours, appetite and production could be restored after supportive treatment for 10 days. Buffalo 2 died despite intensive treatment in with significant hematopoietic abnormalities.

Keywords: Babesia bigemina, haemoglobinuria, anemia, hematopoietic changes, diamenzene, anemia

1. Introduction
Of the prevalent tick born haemoproteozoa diseases among animals, infections caused by hematotropic parasites of the genus Babesia is important in view of their widespread nature which is second only to trypanosomosis [1]. This intraerythrocytic protozoan is prevalent among tropical and subtropical countries including India causing significant morbidity and mortality [2]. The clinical syndrome of babesiosis has considerable impact on health, production and economic viability of affected animals [3]. B bigemina and B bovis—are widespread in tropics and sub tropics and as there are many common features of the diseases caused by different Babesia, much of the information pertaining to them can be applied to other species [4]. Infection, sub acute to chronic can cause retarded growth in calves, death, increased abortion rate, sterility, reduced milk and meat production and high costs of prevention and treatment [5]. Incidence in costal Andhra Pradesh is periodic, influenced by climatic stress, nutritional deficiencies, changing breed composition of herd, selection of geographically unadopted breeds, tick population and lack of acaricidal treatment. The objective of the present study was to discuss the varied clinico pathological and therapeutic aspects of Babesiosis in two buffaloes presented to veterinary hospital Eluru of West Godavari district.

2. Materials and Methods
Two graded Murrah buffaloes (1&2) presented to Veterinary Hospital Eluru, West Godavari district Andhra Pradesh, India, between June-July 2017, constituted the subjects of the study. History includes anorexia, depression and coffee colored urine. The animals were maintained under semi intensive housing system with poor ventilation and were stall fed. Moderate pyrexia (103.4°F), haemoglobinuria, anorexia, reduced ruminal moments constipation were observed in both and ataxia, staggering gait, muscle tremor, constipation were recorded in the second animal. Mucus membrane are pale pink in the first and pale in the second but there is no icterus in both the animals. Tick infestation inside the ears and thighs was observed in both the animals. Thick and thin blood smears collected from ear vein were stained with Giemsa stain [6]. Blood in K2 EDTA and serum samples were collected and subjected to hematological and bio
Hussein et al., (2007) [24] reported the significant increase in aspartate aminotransferase, alanine aminotransferase and gamma glutamyltransferase (GGT) in babesiosis. Anemia and hematopoietic changes are more pronounced in Buffalo 2 where in significant hypoalbuminemia, hypoglycemia and hypocalcemia are recorded which can be attributed to anoxia and inadequate supplementation. Low albumen levels may be due to pronounced hemolytic crises, proteinuria associated with renal failure and anemia in relation to high rise of body temperature [25] and anemic anoxia complicated by circulating immunocomplexes [12]. Reduction of albumin level probably corresponds to disturbance in liver function, urinary loss of albumin associated with proteinuria and anoxia. Babesia can cause disruption in liver function that leads to decrease albumin synthesis [29].

3.1 Treatment

Diminazene aceturate is effective against B. bigemina, but less effective against B. bovis and B. divergens [27]. This is locally available and economical than imidocarb. Both the animals were treated with ready to use Diminazene diaceturate inj. @3.5mg /Kg BW (Berinil RTU Hoechst) given as a single dose. Flunixine meglumine@2.2 mg/Kg (Megludyn, Virbac Pharma) BID day as an antiinflammatory for 3 days. Dextrose normal saline @ 25 ml/kg to combat the moderate dehydration and also to flush hemoglobin sequestrated in renal tissue. Iron sorbital 10mg /kg as a single injection (inj. Ferritas, Intas Pharma) deep intramuscular to combat anemia. B-complex and liver extract preparations (Rumrec, Virbac pharma) were given @ 10 ml /animal /5days as hepato regenerative interventions. Protozoa were cleared from peripheral blood after 12 hours of treatment and by the end of 24 hours the color of the urine was almost normal in both the animals and appetite was partially restored in the first animal which received continued supportive therapy with mineral supplements, concentrate feeding and oral iron sorbital for a period of 15 days. However the second animal deteriorated, recumbent and succumbed on the second day of treatment despite intensive therapy which can be attributed anemic anoxia and hepato renal damage. It is opined that supportive therapy is as important as specific treatment and the recovery is influenced by severity of anemia and extent of pathological changes.

Table 1: Hematobiochemical changes due to Babesiosis in buffaloes.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Parameter</th>
<th>Buffalo 1</th>
<th>Buffalo 2</th>
<th>Normal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hemoglobin (g/dl)</td>
<td>6.1</td>
<td>2.7</td>
<td>8-15.0</td>
</tr>
<tr>
<td>2</td>
<td>RBC 10^6/µl</td>
<td>3.47</td>
<td>1.1</td>
<td>5.0-10.0</td>
</tr>
<tr>
<td>3</td>
<td>WBC 10^3/µl</td>
<td>3.8</td>
<td>2.5</td>
<td>4.0-12.0</td>
</tr>
<tr>
<td>4</td>
<td>PCV %</td>
<td>20</td>
<td>10.7</td>
<td>25-35</td>
</tr>
<tr>
<td>5</td>
<td>MCV fl</td>
<td>58</td>
<td>98.6</td>
<td>40.0-48.0</td>
</tr>
<tr>
<td>6</td>
<td>MCH pg</td>
<td>17.5</td>
<td>24.5</td>
<td>14.0-18.0</td>
</tr>
<tr>
<td>7</td>
<td>MCHC g/dl</td>
<td>30.5</td>
<td>25.2</td>
<td>30.0-36.0</td>
</tr>
<tr>
<td>8</td>
<td>Platelets 10^3/µl</td>
<td>127</td>
<td>46</td>
<td>100-800</td>
</tr>
<tr>
<td>9</td>
<td>Glucose (mg/dl)</td>
<td>60.8</td>
<td>38.5</td>
<td>45-65</td>
</tr>
<tr>
<td>10</td>
<td>Total protein (g/dl)</td>
<td>7.4</td>
<td>7.2</td>
<td>6.0-8.0</td>
</tr>
<tr>
<td>11</td>
<td>Albumen (g/dl)</td>
<td>2.8</td>
<td>2.1</td>
<td>2.5-3.8</td>
</tr>
<tr>
<td>12</td>
<td>Calcium mg/dl</td>
<td>8.66</td>
<td>7.65</td>
<td>9.0-11.0</td>
</tr>
<tr>
<td>13</td>
<td>AST IU/l</td>
<td>165.5</td>
<td>286</td>
<td>60-125</td>
</tr>
<tr>
<td>14</td>
<td>ALT IU/l</td>
<td>46.5</td>
<td>88</td>
<td>23.0-90.0</td>
</tr>
<tr>
<td>15</td>
<td>Creatinine mg/dl</td>
<td>2.4</td>
<td>4.6</td>
<td>1.02-2,17</td>
</tr>
</tbody>
</table>

4. Conclusion

Babesios as a clinical entity is comparatively rare among buffaloes though chronic and carrier states are suspected. Identification of protozoa with Giemsa stained blood smears collected at the height of pyrexia is adequate under field
conditions. The presence of a few infected ticks or even a clinically infected animal may act as focus of infection for the other susceptible animals in the area and may be responsible for subclinical infection or carrier state threatening the health status and economic viability of animals. Evaluation of hemato biochemical changes is essential to know pathognomic effects on the animal including type and severity of anemia and extent of involvement of vital organs and their functioning and can be of immense value to predict a therapeutic outcome. Severe anemia and significant organ damage are responsible for the death despite the treatment. Early detection, specific chemotherapy and intensive supportive therapy are essential for the successful management of the clinical babesiosis in buffaloes.

5. Acknowledgements
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6. References