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Concomitant *Anaplasma marginale* and *Anaplasma bovis* due to natural infection in a crossbred cow: A case report

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Abstract

A seven year old Crossbred Jersey cow was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu with a history of anorexia, reduced milk yield and respiratory distress for five days. Physical examination revealed depression, fever, enlarged prescapular lymph nodes, petechiae conjunctival mucous membrane, emaciated and tachypnoea. The blood profile revealed anemia and monocytosis. The Giemsa stained peripheral blood smear revealed the presence of *Anaplasma bovis* organisms in the monocytes and *Anaplasma marginale* in erythrocytes. The animal was treated with two doses of Inj. Long acting Oxytetracycline @ 20 mg/kg IM and along with supportive. Improvement was noticed after 3 days of treatment and uneventful recovery was noticed.

Keywords: *Anaplasma bovis*, *Anaplasma marginale*, oxytetracycline, bovine, anemia

Introduction

Bovine anaplasmosis is economically important tick born infection of bovine industry in worldwide [1]. The etiology of clinical form of bovine anaplasmosis are *Anaplasma marginale*, *Anaplasma centrale*, *Anaplasma phagocytophilum*. Anaplasmosis also called as Gall sickness, It's a intraerythrocytic rickettsia, *Anaplasma marginale*, which is transmitted biologically by infected ticks or mechanically by biting flies and contaminated fomites. The *Anaplasma bovis* also a tick born infection in cattle and it was previously called as *Ehrlichia bovis* [2]. Both the *Anaplasma marginale* and *Anaplasma bovis* were transmitted by *Rhipicephalus appendiculatus*, *Amblyomma variegatum* and *Hyalomma truncatum*. The *Anaplasma bovis* is mainly replicate in monocytes and produce infective elementary bodies [3]. The disease manifested of anaplasmosis are fever, anemia, fever, enlargement of peripheral lymphnodes, anorexia, weight loss, jaundice, uncoordinated movements, abortion and death [4]. The present article describes the concomitant *Anaplasma marginale* and *Anaplasma bovis* due to natural infection in crossbred cattle was reported and it was successfully managed.

Case history and Observations

A seven year old Jersey cross breed cow was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu with the history of anorexia, weakness, reduced milk yield and respiratory distress for five days. Physical examination revealed depression, emaciation, enlarged prescapular lymph nodes, petechiae conjunctival mucous membrane and ticks were noticed all over the body. Increased rectal temperature 104.5 °F, heart rate 82 per minute and respiratory rates 42 per minute were observed. Blood sample was directly collected from jugular vein in EDTA (Lavender capped tube) for hematology and clot activator (Red capped tube) for serum biochemical analysis. The blood smear was collected from tip of ear vein. Ticks were collected and identified as per standard procedure [5]. The hemogram was performed as per the procedure described by Benjamin [6]. Serum biochemistry was done in semi-autoanalyzer by using commercially available kits. The peripheral blood smear was fixed with methanol for a minute and stained with Giemsa stain for 30 minutes, and screened for the presence of blood parasites.

Results and Discussion

The Giemsa stained smear revealed the presence of *Anaplasma marginale* in RBC *Anaplasma bovis* (Fig 1) in the monocytes, and *Anaplasma bovis* in the monocytes (Fig 2). Babuprasath

Babuprasath *et al.* [7] reported *Anaplasma bovis* (Ehrlichia bovis) in a crossbred cow. Jayalakshmi *et al.* [8] reported incidence of Anaplasmosis in cattle of Cauvery delta region of Tamil Nadu. Kolte *et al.* [9] stated that anorexia, pyrexia, anaemia and lymph node enlargement these observation similar to the present case report. Soulsby [5] reported that high temperature, dehydration and reduced milk yield these observations was similar to current case report. Hemato-biochemical alteration of *Anaplasma marginale* and *Anaplasma bovis* infection in crossbred cattle are given in Table 1. On the day of infection, the hematology revealed severe anemia and monocytosis which was lower than the standard hematological parameter in cattle [3] and it correlated with Jayalakshmi *et al.* [8]. In this case anemia may be due to parasitemia leading to multiplication of the organism in the erythrocytes which results intravascular hemolysis. The Monocytosis may be due to the multiplication of the *A.bovis* within the cells. Serum biochemistry revealed reduction in total protein and albumin and elevated bilirubin, AST and ALP level were noticed, this was lower than standard value [3] and the elevation of liver enzymes and reduction in protein due to liver parenchymal damage [10]. The animal was treated with two dose of long acting Oxytetracycline @ 20 mg/kg IM at 72 hrs intervals. Supportive therapy with Inj. Meloxicam @ 0.5mg/kg IM, Inj. Vitamin B1, B6 and B12 @ 10ml total dose IM for three days, mineral supplements and oral haematinic for 15 days. The clinical improvement was observed after three days of therapy. Oxytetracycline and hematinic is more effective for Anaplasmosis this agreement with Radostits *et al.* [3]. Post treatment analysis was done after 15 days, and improvement in hematology and biochemical parameters were observed. The animal recovered uneventfully.

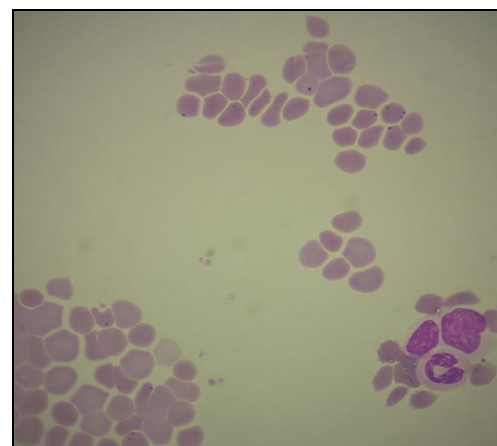


Fig 1: Peripheral blood smear: Cow - *Anaplasma marginale* (1000x)

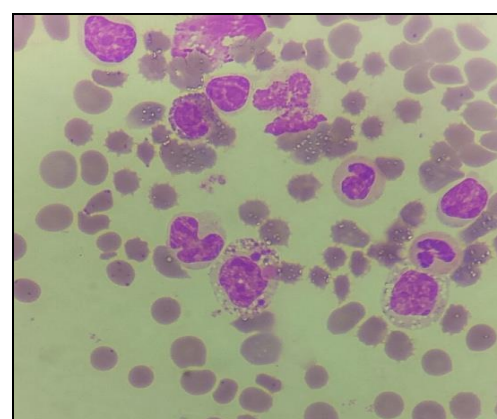


Fig 2: Peripheral blood smear: Cow - *Anaplasma bovis* (1000x)

Table 1: Hemato-biochemical alteration of *Anaplasma marginale* and *Anaplasma bovis* infection in crossbred cattle.

Parameters	Reference level (Radostits <i>et al.</i> , 2000) [3]	Before treatment (0 day)	After treatment (15 days)
Hb (g/dl)	8.5–12.2	4.6	8.9
PCV (%)	22–33	12.1	28.7
RBCs (10 ⁶ /μl)	5.1–7.6	3.2	6.8
WBCs (per/μl)	4900–12,000	7250	8540
Neutrophils (%)	15–33	22	25
Basophils (%)	0–2	0	1
Eosinophils (%)	0–20	2	5
Lymphocyte (%)	45–75	61	65
Monocytes (%)	0–8	15	4
Total Protein (g/dl)	5.7–8.1	5.2	5.8
Albumin (g/dl)	2.1–3.6	2.0	2.3
Total Bilirubin (mg/dl)	0.01–0.5	0.78	0.45
Direct Bilirubin (mg/dl)	0.04–0.44	0.62	0.38
AST (U/L)	78–132	265	135
ALP	0-200	542	196

Conclusion

Concomitant *Anaplasma marginale* and *Anaplasma bovis* due to natural infection in a Crossbred Cow was recorded.

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