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Concurrent infection of babesiosis and amphistomiasis in a dairy cow complicated with traumatic pericarditis

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Abstract

A 6 year old crossbred jersey cow was presented with a history of anorexia and watery diarrhea for 3 days during the month of April 2017. The peripheral blood smear was positive for *Babesia bigemina* and blood picture showed anaemia. Serum biochemistry revealed hypoproteinemia and hypoalbuminemia. Faecal examination revealed no parasites initially. The animal was treated with Diaminazene aceturate @ 3.5 mg/kg bwt along with electrolytes and supportive therapy. Improvement observed after treatment for Babesiosis. Second time the animal presented with anorexia, jowl edema with bilateral engorgement of jugular vein after 7 days of initial treatment. Faecal examination revealed *Amphistome* sp egg. Thoracic radiography showed radio opaque metal in reticulum without adhesion. ECG revealed reduced amplitude of QRS complex. Ultrasound assessment of thorax showed severe pericardial effusion, ultrasound guided pericardiocentesis yielded, pericardial fluid analysis revealed low leukocyte count and no growth on culture. So the case is confirmed as Aseptic traumatic pericarditis. Thereafter animal was treated with single dose of Oxytetracycline oral suspension @ 10mg/kg and Injection Oxytetracycline 10mg/kg along with supportive therapy given for consecutive five days. Pericardial effusion was reduced on third day of treatment. The animal was recovered successfully and moderate improvement in blood picture was observed

Keywords: Cow, Pericardial effusion, Amphistomiasis, Babesiosis

Introduction

Parasitic infections constitute a major problem in cattle breeding industry by lowering vitality and decrease the production and reproductive performance of animals indirectly [1]. Among parasitic diseases, babesiosis and amphistomiasis causes major economic losses than any other parasitic infection in terms of productivity and death. Babesiosis is one of the important tick borne diseases of cattle in tropical and subtropical areas, caused by intraerythrocytic protozoa *Babesia bigemina* and *Babesia bovis*, which is characterized by fever, anorexia, reduced milk yield, hemolytic anemia, hemoglobinuria and jaundice [2]. Amphistomiasis is one of the emerging infectious diseases in ruminants caused by a variety of *Paramphistome* sp causes mortality and low productivity [3]. Large number of immature flukes in the duodenum causes diarrhoea, anorexia, rough hair coat, intestinal haemorrhages, anaemia, reduced milk production and intermandibular edema and death [4].

Traumatic pericarditis is a common disorder in cattle following ingestion of metallic foreign bodies through feed and fodder [5]. The incidence is more common in cattle and buffalo than other animals and also in pregnant and recently calved animals due to increased intra-abdominal pressure pushes the foreign body towards the thorax and pierces the pericardium at one or more place results in pericarditis [6]. Pericarditis is an inflammation of the pericardium with accumulation of fluid or exudate between the visceral and parietal pericardium impairs the ability of heart to pump and shows signs of congestive heart failure [7]. In cattle, it is often attributable to a reticular foreign body that has penetrated the reticular wall, diaphragm and pericardial sac, rarely caused by the penetration of the wire through the skin, with subsequent migration into the sternbrae and pericardial sac [8]. The haematogenous spread of infectious diseases such as colibacillosis, pasteurellosis, salmonellosis and anaerobic infections may also causes pericarditis, which is less common and is usually masked by signs of septicemia [9]. The present paper describes the concurrent anemic crisis associated with Babesiosis, Anaplasmosis and traumatic pericarditis in a dairy cow.

Materials and Methods

A 6 year old crossbred jersey cow was presented to Large Animal Medicine Unit of TVCC, VC&RI, Orathanadu with a history of anorexia and watery diarrhoea for 3 days during the month of April 2017. On clinical examination, animal showed dullness and depression, pale conjunctival mucous membrane, sluggish rumen motility with normal prescapular lymph node. The rectal temperature was 40.2 °C, heart rate 65/min, pulse rate 74/min and respiratory rate 22/min. The clinical samples peripheral blood smear, faeces, whole blood and serum samples were collected for laboratory analysis. The peripheral blood smear was stained with Giemsa stain after methanol fixation for a minute [10]. The stained blood smear was screened for haemoprotozoa under light microscope. Faecal sample was processed by centrifugal sedimentation technique. Haematological analysis was carried out as per procedure mentioned by Benjamin [11]. Biochemical analysis was done with semi-autoanalyzer. A week later the same animal was presented with anorexia, intermandibular edematous swelling with bilateral engorgement of jugular vein. For further laboratory analysis again peripheral blood smear, whole blood, serum and fecal sample were collected. Radiography of thorax was taken. Electrocardiography of heart was taken with Portable ECG machine by using base apex lead system. The ultrasound examination of heart was done on third to sixth intercostal space by using 3.5-5.0 MHz convex probe. Pericardiocentesis was done at ventral one third of 5th intercostals space. About 350 ml of yellow colored clear serous fluid with fibrin shreds was collected and analyzed. Culture of pericardial fluid was also done.

Results and Discussion

The stained peripheral blood smear was positive for *Babesia bigemina*. Faecal sample was negative for parasitic egg and oocyst. The haematological analysis revealed decreased level of haemoglobin, packed cell volume and red blood cell count. The serum biochemistry showed decreased level of protein and albumin (Table 1). This is in accordance with the report of Alam and Nasr [1] except liver enzymes. Who reported that animal infected with babesiosis and theileriosis showed significant reduction of the total protein, albumin, globulin, cholesterol, triglycerides and glucose level and elevated level of liver enzymes AST, ALT, Alkaline phosphatase and total bilirubin. In this study the animal was treated with injection Diaminazene acetate @ 3.5 mg/Kg b.wt. Melaxicum @ 0.5 mg/Kg b.wt, Chlorpheniramine maleate @ 0.5 mg/Kg b.wt along with supportive therapy Vitamin B1, B6 and B12 (Tribivet) 10 ml intramuscularly and Sharcoferal 50 g twice a day P/o. The animal was temporarily

recovered; improvement in blood picture was noticed after 7 days of treatment (Table 1). This is concomitant with the report of Jayalakshmi *et al.* [12]. The same animal again presented with anorexia, intermandibular edema (Fig. 1) and bilateral engorgement of jugular vein (Fig. 2) after a week of initial treatment for babesiosis. On further laboratory analysis, the peripheral blood smear was negative for haemoprotozoa, the faecal sample was positive for *Amphistome* sp, but initially negative. Thoracic radiography revealed wire like radio-opaque metal object. Electrocardiography showed reduced amplitude of QRS complex (0.5 mV in the base apex lead) which is an indication of pericardial effusion. This is in concomitant with the report of Athar *et al.* [5]. Who reported the most ECG changes in QRS complex was less than 1.5 mV in the base-apex lead. The ultrasonographic assessment of heart revealed severe pericardial effusion results in separation of pericardium from epicardium and is evident over the ventricles (Fig. 3). This is in concordance with the report of Sojka *et al.* [8]. The effusion appeared as anechoic to hypochoic, with small amount of fibrin adhered to the epicardium. This is in accordance with the report of Streeter *et al.* [13]. Pericardial fluid analysis revealed leukocyte count 1250 cells/ μ l, total protein 3.2 g/dl and no growth on culture. So, the case was confirmed as aseptic pericarditis. Blood picture revealed anemia and neutrophilia, which may be due to concurrent parasitic infection and traumatic injury to the heart. The animal was treated with single dose of Oxytoclozanide oral suspension @ 10 mg/Kg b.wt for amphotomiasis. The disappearance of intermandibular edema was observed after three days of treatment. This is in concordance with the report of Suchita *et al.* [14]. Who reported that intermandibular edema was started to disappear on 3rd day and completely disappeared on 7th day of Oxytoclozanide therapy. The other treatment like Inj.Oxytetracycline @ 10 mg/Kg b.wt diluted in 5% Dextrose Normal Saline and was given intravenously. The supportive therapy like Melaxicum 0.5 mg/Kg b.wt, Chlorpheniramine maleate @ 0.5 mg/Kg b.wt, Vitamin B₁, B₆ and B₁₂ (Tribivet) 10 ml and Frusemide @ 0.3 mg/Kg b.wt were given intramuscularly. Post treatment ultrasound examination of heart revealed slightly reduced level of pericardial fluid on next day. The above mentioned treatment was continued for consecutive four days except frusemide. The dose of frusemide was increased @ 0.5 mg/Kg b.wt and was given for one more day. Ultrasound examination of heart on third day revealed significant reduction of pericardial fluid (Fig. 4). The animal resumes feed intake and blood picture was moderately improved after treatment. The animal was clinically recovered successfully.

Table 1: Results of Haematobiochemical parameters.

Parameters	Haemogram			Serum biochemistry			
	Prior to treatment	7 DAT	15 DAT	Parameters	Prior to treatment	7 DAT	15 DAT
Haemoglobin (g/dl)	4.2	5.80	6.10	Total protein	5.3	5.84	6.21
PCV (%)	12.0	17.0	22.0	Albumin	2.2	2.00	2.60
RBC ($10^6/\mu$ l)	2.32	3.29	4.10	Globulin	3.1	3.84	3.61
WBC ($10^3/\mu$ l)	12.20	5.90	6.80	AST	75.0	75.0	70.0
MCV (fl)	51.7	51.6	53.60	Creatinine	0.7.0	0.58	0.46
MCH (pg)	18	17.6	17.30	BUN	28.0	24.0	34.0
MCHC (g/dl)	35	34.0	32.20	Glucose	62.0	68.0	65.0

DAT-Days after Treatment



Fig 1: Intermandibular edema



Fig 2: Bilateral engorgement of jugular Vein



Fig 4: USG-Reduction of pericardial effusion after treatment

Conclusion

The concurrent anemic crisis associated babesiosis and anaplasmosis in animal is prevented by proper deworming and tick control measures. In traumatic pericarditis, typical clinical signs such as tachycardia, muffled heart sound, distension of jugular vein and brisket edema are not always present in all cases. Treatment is usually not rewarding in late cases. However, early diagnosis of pericardial effusion without any adhesion gives good prognosis. The pericardial effusion in cow was best managed with pericardiocentesis, diuretics, broad spectrum antibiotics and anti-inflammatory drugs. The disease may be prevented by proper managerial practices.

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Fig 3: USG-Pericardial effusion before treatment

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