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Erythrocytic anaplasmosis with *Fasciolosis* in a cross-bred cattle: A case report

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ABSTRACT: An 8 year old cross bred female cow weighing about 250 kg was admitted to Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Pantnagar with the history of anorexia, reduced water intake, progressive weakness, high fever, shivering, tachycardia, laboured breathing and respiratory distress since 7-8 days. Animal was dehydrated and weak. Physiological parameters like rectal temperature, heart rate, and respiratory rate were found to be 104.6 °F, 89 beats/minute and 49/minute, respectively. Peripheral blood smear examination revealed the presence of *Anaplasma marginale* on the margin of erythrocytes. Faecal examination revealed presence of eggs of *Fasciola* spp. On the basis of these findings, the condition was diagnosed as erythrocytic bovine anaplasmosis and the case was treated with two doses of Oxytetracycline @ 10 mg/kg body weight intravenous in NSS, Meloxicam @0.5 mg/kg body weight I/M and Triclabendazole @ 12 mg/kg orally once. Improvement was noticed after 3 days of treatment.

Key words: *Anaplasma marginale*, cross breed cow, *Fasciolosis*

Anaplasmosis is a systemic tick borne infectious disease caused by five recognised species of *Anaplasma* viz. *A. marginale*, *A. centrale*, *A. bovis*, *A. phagocytophilum* and *A. ovis* belonging to the family Anaplasmataceae of the order Rickettsiales (Dumler *et al.*, 2001). *Anaplasma marginale* is an obligate intracellular rickettsial organism which infects the blood cells of mammals (Rymaszewska and Grenda, 2008). It mainly affects cattle but other ruminants like sheep, goats, buffalo and some wild ruminants can also be infected with the erythrocytic anaplasmosis (Kocan *et al.*, 2003). Cattle have been found to be more susceptible to *Anaplasma* infection than the buffalo (Rajput *et al.*, 2005). It is transmitted by the bite of hard tick *Rhipicephalus (Boophilus) microplus* which is considered to be the main vector (Aubry and Geale, 2011). Transmission of the disease also occurs mechanically by biting flies and blood contaminated fomites which act as alternative means of spread viz., infected RBCs through insect bites, needles and during minor operational procedures like dehorning etc. Transstadial transmission may also occur. Disease is characterised by progressive haemolytic anaemia, decrease milk production, jaundice, hyper-excitability, dullness, depression, weakness, dark coloured urine, loss of appetite, muscular tremors, constipation, pale mucus membrane and laboured breathing (Bram, 1983). In acute cases, abortion may occur. Despite recent advances for diagnosis of bovine anaplasmosis and other hemoprotozoan from clinical samples, classical Giemsa stained thin blood smear (GSTBS) parasitological method is a gold standard test for early, easy and economic detection of parasite.

Fasciolosis is a highly pathogenic disease caused by liver fluke species (Javaregowda and Rani, 2017). There are two important species that affect cattle and buffalo are *Fasciola hepatica* and *Fasciola gigantica*. *Fasciola hepatica* is widely prevalent in hilly areas and *Fasciola gigantica* in other places (Pandya *et al.*, 2015). Fasciolosis caused by *Fasciola gigantica* is one of the most economically morbid helminthic infections of cattle and buffalo in India (Murthy and D'Souza, 2015). Adult flukes are found in bile ducts of liver and cause inflammation and hyperplasia of the epithelium leading to cirrhosis of liver, cholangitis and cholecystitis resulting in mechanical obstruction of the biliary duct (Cable *et al.*, 1997). Chronic case may lead to jaundice. Traditionally, fluke infections have been diagnosed by detecting eggs in faeces (Anderson *et al.*, 1999). The present report describes a case of mixed infection of anaplasmosis and fasciolosis in a cross bred cattle.

Case history

An 8 year old, cross bred, female cow, weighing about 250 kg was brought to the Teaching Veterinary Clinical Complex of College of Veterinary and Animal Sciences, Pantnagar, Uttarakhand with the history of anorexia, reduced water intake, shivering, respiratory distress, marked reduction in milk yield since 7-8 days.

Clinical examination of the animal revealed pale mucus membrane (Figure 1), dullness, slightly enlarged pre-scapular lymph nodes, tick infestation, slightly dark coloured urine and foul smelling faeces. Physiological

parameters *viz.*, rectal temperature, heart rate and respiratory rate were found to be 104.6°F, 89 beats/minute and 49/minute, respectively. Animal was dehydrated and weak.

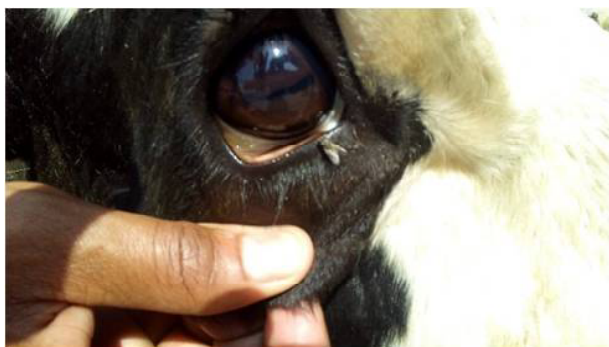


Figure 1: Picture showing the pale and yellowish mucous membrane

Laboratory Examination

Blood sample was taken from the jugular vein in the EDTA coated vial. Faecal samples were collected from rectum of the animal. Blood and faecal samples were sent to lab for estimation of haematological parameters like haemoglobin, packed cell volume, total erythrocytic count, mean corpuscular volume, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration and differential leukocytic count and screening for blood parasites. Haematological parameters were studied at 0 and 6th days post treatment (DPT) while differential leukocytic count was estimated at 0 DPT only. Faecal sample was examined by both direct smear and sedimentation method (Soulsby, 1982). Blood sample for parasite was examined by the thin blood smear method. For this, thin blood smear was made from fresh blood without anticoagulant, on a clean glass slide immediately after the withdrawal of blood from the vein. Blood smear was then air dried and fixed with absolute methanol for 1-2 minute. Blood smear was then stained with 20 % diluted Giemsa's stain for 40 minutes. Slide was then washed with running tap water and the smear was air dried. Thereafter, it was observed under oil emersion (Vatsya *et al.*, 2013). Slide was examined covering about 50 microscopic fields.

Diagnosis

Faecal sample revealed peculiar golden coloured, oval shaped operculated eggs which are characteristic of *Fasciola* spp. eggs (Fig. 2). Thin blood smear revealed peculiar dot forms of *Anaplasma marginale* at the margin of stained RBCs (Fig. 3) (Soulsby, 1982). Hematological studies revealed a low hemogram (Table 1). Differential leukocytic count (DLC) revealed 62% neutrophils, 35%

lymphocytes, 3% eosinophils, 4% monocytes and 0% basophils.



Fig. 2: *Fasciola* spp. eggs in the faecal sample prepared by sedimentation method (400 x).

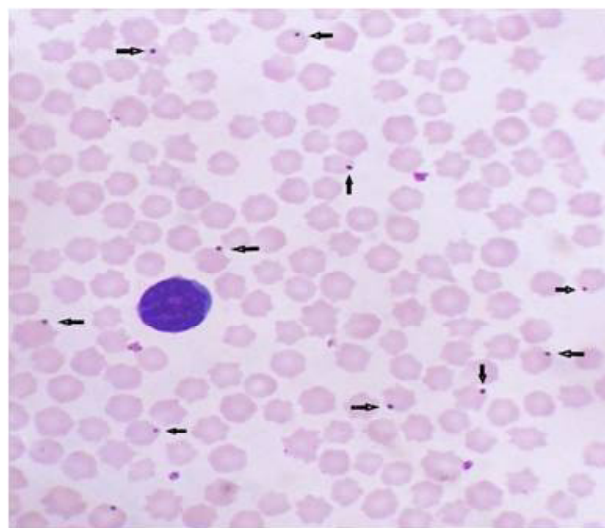


Fig. 3: *Anaplasma marginale* on margin of red blood cells seen under oil emersion.

Table: 1: Hematological parameters of the animal at 0 and 6th day post treatment

Parameters	0 day	6 th day
Hb (g/dl)	4	6.4
PCV (%)	12	18
TEC (Million/Cu mm)	2.77	3.80
MCV (fl)	43.33	47.37
MCH (g/dl)	14.5	16.85
MCHC (pg/dl)	33.34	35.56

Treatment

Animal was treated with Oxytetracycline@10 mg/kg body weight by slow intravenous administration after mixing it in 1000 ml of normal saline solution daily for 6 days. Meloxicam @0.5 mg/kg body weight was administered by deep intramuscular route, Triclabendazole@12mg/kg was given once orally, injection B-complex was given @10 ml by intramuscular route once on alternate day for 6 days. Other supportive therapy like iron supplement Ferritas @ 10 ml deep intramuscularly every 3rd day, iron syrup Rakkt @50 ml orally daily for 10 days, injection Belamyl @ 10 ml intramuscularly on alternative days for 10 days, syrup Multistar plus @ 50 ml orally for 10 days. As the animal responded to treatment, improvement was noticed 3rd DPT as clinical signs started to subside from 3rd DPT onwards with decreasing body temperature. Faecal sample found negative for *Fasciola* spp. egg after giving anthelmintic at 4th DPT. Appetite started to improve. Stool and dark coloured urine started returning to normal.

CONCLUSION

Combined infection of *Anaplasma marginale* and *Fasciola* spp. in a cross bred cow was successfully treated with administration of Oxytetracycline and Triclabendazole, respectively.

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