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Anaplasma marginale infection in a cow: A case report

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Abstract

A 4 years and 6 months old cow with a clinical history of inappetance, weakness, reduced milk yield, raw turmeric colour loose stool, dark urine colour, high body temperature (103.9°F), tachycardia, slight lung congestion, papery white mucous membrane and tick infestation was found to be suffering with *Anaplasma marginale*. On microscopic examination of blood smear *Anaplasma marginale* organisms were diagnosed. Low haemoglobin level (6.5g/dl), low PCV (18.7%) and low erythrocyte count (4.34M/mm³) were observed on haematological analysis. It was treated with Oxytetracycline @ 10 mg/kg body weight intravenously by mixing with 500 ml of normal Saline solution 12 hourly for 5 days, Restobal @ 50 ml orally twice daily for 10 days, Tribivet injection @ 10 ml intramuscularly at alternate day for 5 occasions were found effective. Though clinical signs started to subside from 2nd day of post-treatment with decreasing body temperature, increasing appetite, stool and urine colour returning to normal but complete recovery was observed around 21st days of post-treatment and that was accounted by returning the milk yield normal level and maintenance of all other body condition.

Keywords: *Anaplasma marginale*, crossbred cow, Giemsa stain, oxytetracycline

Introduction

Anaplasma marginale is an obligate intraerythrocytic rickettsial organism belonging to the family Anaplasmataceae of the order Rickettsiales (Dumler *et al.*, 2001) [4]. Cattle, sheep, goats, buffalo and some wild ruminants can be infected with the erythrocytic *Anaplasma* but cattle have been found to be more susceptible to *Anaplasma* infection than the buffalo (Rajput *et al.*, 2005) [5].

It is transmitted mainly by tick *Rhipicephalus* (*Boophilus*) microplas which is considered to be the main vector (Aubry *et al.*, 2011) [2]. Mechanical transmission by biting flies or blood-contaminated fomites act as alternative means of spread. Infection is characterised by progressive haemolytic anaemia associated with production, abortion, hyper-excitability, dullness/depression, rapid deterioration of the physical condition, brownish urine, loss of appetite, muscular tremors, constipation, pale mucus membrane and laboured breathing (Bram, 1983) [3]. 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.

Case history

A 4 years and 6 months old cow was brought to the TVCC, College of Veterinary Science, AAU, Khanapara, Guwahati-22 with a complaint of inappetance, weakness, reduced milk yield, raw turmeric colour, loose stool, dark colour urine, high body temperature (103.9°F), tachycardia, slight lung congestion, papery white mucous membrane and infestation with tick were observed. The cattle was administered Oxytetracycline @ 10 mg/kg body weight intravenously by mixing with 500 ml of normal saline solution 12 hourly for 5 days, Restobal @ 50 ml orally twice daily for 10 days, Tribivet injection @ 10 ml intramuscularly at alternate day for 5 occasions were found effective.

Materials and Method

Faecal sample was examined both by direct smear and sedimentation method (Soulsby 1982) [6]. A drop of blood sample was taken on a clean grease free microscope glass slide, spread by the edge of another slide at an acute angle, air dried and fixed with absolute methanol for 2-3

minutes. The fixed thin blood smear were stained with 10 % Giemsa's stains (1 ml of stock Giemsa's stains was diluted in 9 ml of distilled water or phosphate buffered saline-PBS) for 30 minutes. Excess stain was removed by distilled water. The slide were air dried and examined under a compound microscope using oil immersion objective (100 x). Each slide was examined covering about 50 microscopic fields for detection of *Anaplasma marginale*. Both blood smear examination and calculation of haematological parameters viz. haemoglobin concentration, Packed cell volume (PCV %), total erythrocytes count were done pre treatment and post treatment at weekly interval for three weeks.

Treatment

Treatment with Oxytetracycline@ 10 mg/kg body weight intravenously by mixing with 500 ml of normal saline solution 12 hourly for 5 days, Restobal @ 50 ml orally twice daily for 10 days, Tribivet injection @ 10 ml intramuscularly at alternate day for 5 occasions.

Result and Discussion

Faecal sample was found to be devoid of any kind of parasitic ova/egg/oocyst. Thin blood smear showed presence of dot forms (Fig. 1) of *Anaplasma marginale* (Soulsby, 1982) [6] at the margin of stained RBCs. Blood picture revealed decreased Hb concentration, PCV level and RBC count (Table no. 1). Clinical signs started to subside from 2nd day of post-treatment with decreasing body temperature, increasing appetite, stool and urine colour returning to normal but complete recovery from parasite and symptoms was observed around 21st days of post-treatment and that was accounted by returning the milk yield normal level and maintenance of all other body condition. Low haemoglobin level (6.5g/dl), low PCV (18.7%) and low erythrocyte count (4.34M/mm³) were similar with the finding of Arunkumar and Nagarajan (2013) who also observed similar trends of haematological values in *Anaplasma* infected animals.



Fig: Picture showing at the margin of erythrocyte dot like form of *Anaplasma marginale* in giemsa stained blood smear (x100).

Table 1: Blood picture of *Anaplasma marginale* infected cattle

	Parameter		Days post treatment	
	0	7	14	21
Hb(g/dl)	6.50	8.10	9.20	10.80
PCV (%)	18.70	24.5	28.00	30.10
RBC(M/mm ³)	4.34	5.10	5.70	6.0

Conclusion

Anaplasma marginale can be successfully treated in cow with administration of Oxytetracycline, Restobal, Tribivet. Confirmation of *Anaplasma marginale* and treatment is

necessary if the cow has clinical signs of inappetance, weakness, reduced milk yield, raw turmeric colour loose stool, dark urine colour, high body temperature, tachycardia, lung congestion, papery white mucous membrane and tick infestation.

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