Acute anaplasmosis in a holstein-friesian cross breed cattle: A case report

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Abstract

A six year old Holstein-Friesian cross-bred cow with the history of weakness, anorexia, shivering and respiratory distress, marked reduction in milk yield, difficulty in standing after sitting since a week was reported in Udaipur, Rajasthan. On hematological analysis, Low haemoglobin level (2.8 gm %) was observed. On microscopic examination of the stained blood smear revealed the presence of \textit{Anaplasma marginale} organisms as solid dots on the periphery the RBC. Based on these findings a diagnosis of anaplasmosis was made and the case was treated with Oxytetracycline @20 mg/kg body weight, I/V, for five days, Imidocarb (3 mg/kg body weight) for one day and other supportive therapies. Improvement was noticed after three days of treatment.

Keywords: \textit{Anaplasma marginale}, giemsa stain, oxytetracycline, Rajasthan

Introduction

Anaplasma is an obligate intracellular rickettsial organism which infects the blood cells of mammals (Rymaszewska and Grenda 2008) [15]. \textit{Anaplasma marginale} is an obligate intraerythrocytic rickettsial organism belonging to the family \textit{Anaplasmataceae} of the order Rickettsiales (Brahma et al., 2018) [4]. It mainly affects cattle but other ruminants like buffalo, bison, African antelopes can also be infected (Vatsya et al., 2013) [18]. Anaplasma is one of the most important parasites transmitted by at least 20 ticks species (Rajput et al., 2005) [19]. It is transmitted mainly by tick \textit{Rhipicephalus microplus} which is considered to be the main vector (Aubry and Geagle, 2011) [2]. The organism is also transmitted mechanically by infected RBCs through insect bites, needles and during minor operational procedures like dehorning etc. Infection is characterized by progressive haemolytic anaemia, brownish urine, muscular tremors, dullness/depression, hyper-excitability, rapid deterioration of the physical condition, loss of appetite, constipation, pale mucus membrane and laboured breathing, abortion (Bram, 1983) [5]. Anaplasmosis is endemic in tropics and subtropics (Torina et al., 2008) [17]. The occurrence of anaplasmosis in India has been reported from various states like Rajasthan (Bhatnagar et al., 2015) [9], Haryana (Kumar and Sangwan, 2010) [9], Tamil Nadu (Karunamoorthy et al., 1992 [7]; Ramesh et al., 2008[14]), Kerala (Chirayath et al., 2012; Nair et al., 2013) [6, 10], Maharashtra (Kolte et al., 2003) [8]. The present paper reports the occurrence and successful treatment of anaplasmosis in a Holstein-Friesian cross breed cattle.

Case history

A six year old Holstein-Friesian cross-bred cow with the history of weakness, anorexia, shivering and respiratory distress, marked reduction in milk yield, difficulty in standing after sitting since a week was reported in Udaipur, Rajasthan.

Clinical examination

On close physical examination, enlarged prescapular lymph nodes, whitish mucous membrane (Fig. 1), dullness, serous nasal discharge, and severe tick infestation were noticed. Physiological parameters like rectal temperature, heart rate and respiratory rates were found to be 102.5 F, 87 beats per minute and 49 per minute respectively.
About 5 ml of blood sample was collected by jugular venipuncture into an EDTA vacutainer for haematological examination. Peripheral blood was also collected from ear vein and a smear was stained with giemsa to look for any blood parasite (Brahma et al., 2018) [4]. Both blood smear examination and calculation of haematological parameters viz. haemoglobin concentration, total leucocyte count was done. Ticks were collected, processed and identified as per standard procedure (Soulsby, 2006) [10].

Diagnosis
Microscopic examination of the stained blood smear revealed the presence of Anaplasma marginale organisms as solid dots on the periphery the RBC (Fig. 2). Based on the morphological characters, the collected ticks were identified as Rhipicephalus spp. Based on all these findings a diagnosis of anaplasmosis was made.

Treatment
The case was treated with Oxytetracycline @20 mg/kg body weight, I/V, for five days, Imidocarb (3 mg/kg body weight) for one day, Imferon (5 ml), Tribivet injection @ 20 ml, Tonophs injection @ 20 ml intramuscularly each at alternate days for 5 occasion, Vit AD₃ injection @ 10 ml intramuscularly for one day Other supportive therapies like Meloxicam and Paracitamol @0.5 mg/kg body weight, I/M for 5 days, Calcium magnesium plus 20% dextrose (Mifex) 450 ml, intravenous was given. Blood transfusion (500 ml) from healthy non-infected cattle was also done.

Results and Discussions
Clinical sign and symptom which are observed in present study like pyrexia, enlargement of lymph nodes and inappetence are in conformation with the findings of Kolte et al., (2003) [8] and Priyanka et al., (2017) [11] who also reported the presence of similar sign and symptom. Other symptoms like grinding of teeth (Karunamoorthy et al., 1992) [7], staggering gait and incoordination (Ramesh et al., 2008) [14] were also observed in the present case. Microscopic examination of the stained blood smear revealed the presence of Anaplasma marginale organisms in the RBC. Despite recent advances for diagnosis of anaplasmosis from clinical samples, classical giemsa stained thin blood smear is a gold standard test for early, easy and economic detection of parasite (Brahma et al., 2018) [4]. On hematological examination, hemoglobin and total leukocyte count were i.e., 2.8 gm % and 18000 cells/cmm respectively. Low haemoglobin level (2.8 gm %) in this study are in the agreement with the finding of Vatsya et al., 2013 [18]; Arunkumar and Nagarajan (2013) [11]; Priyanka et al., 2017 [11] and Brahma et al., 2018 [4] who also observed low haemoglobin level values in Anaplasma infected animals. Blood transfusion in large animals is not commonly done in India, though, it is recommended in standard text book (Radostitis et al., 1995) [12]. The major hurdle in this approach is availability of blood transfusion bags. So a direct approach has been made in this case using 50 ml syringe for transfusion blood from non-descript donor cow to affected cow. Significant clinical improvement was noticed after 3 days of treatment with increasing appetite, decreasing body temperature and slightly pinkish mucus membrane (Fig. 3) and the case as fully clinical recovered after some time which was consistent with work of Vatsya et al., 2013 [18] who also observed similar finding. Faster recovery might be attributed to the early diagnosis, higher dose of oxytetracycline and supportive therapy with blood transfusion used in the present case. This is in corroborate the finding with the findings of Brahma et al., 2018 [4] who opined that Oxytetracycline is more effective at higher doses.

Conclusion
Anaplasmosis can be successfully treated in Holstein-Friesian cross-bred cow with intra venous administration of oxytetracycline.

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Fig 1: Photograph showing whitish mucous membrane

Fig 2: Photograph showing Anaplasma marginale at the margin of erythrocyte in giemsa stained smear (x100)

Fig 3: Photograph showing pinkish mucous membrane
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