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Therapeutic management of theileriosis in bovines

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Abstract
Theileriosis is a major tick haemoprotozoan disease in cattle, buffalo, sheep, goat and horses as well as wild ruminant animals However, indigenous cattle (*Boss indicus*) are less affected by Theileriosis than crossbred cattle. Among the various tick born haemoprotozoan disease, bovine tropical Theileriosis caused by *Theileria annulata* and transmitted by *Hyalomma anatolicum* anatolicum ticks species, results in lethal infections and considerable high mortality in crossbred cattle then the Zebu cattle. Once infected the animals remain carrier for life time, since the organisms hide in macrophage and lymphoid tissue. The compromises the immune system and the animal are prone to a number of super infections. 5 clinical cases of Theileriosis in calves recorded at Veterinary Clinical Complex, Post Graduate Institute of Veterinary Education & Research, Jaipur (Raj.) during October, 2018 to November, 2018. Clinically, fever, tachycardia, polypnea, reduced appetite, dullness or emaciated body condition with rough hair coat (Presence of ticks on skin or hair coat), pale to icterus to whitish mucous membrane and enlargement of both lymph node (Parotid and Prescapular lymph node) was observed. The cases were diagnosed on the basis of clinical findings, laboratory investigation and blood smear examination. Treatment with combination therapy of Buparvaquone and oxytetracycline along with haematinics and multivitamins and advised of beet feeding were found effective against bovine Theileriosis.

Keywords: Theileriosis, tick, cattle, Buparvaquone, oxytetracycline

Introduction
India having tropical climate, prevalence of clinical Theileriosis is high (Dhar *et al*., 1987) [7]. Haemoprotozoan disease cause devastating losses to the livestock industry throughout the word due to loss of productivity and cost of treatment (D'Haese, 1999) [4]. Theileriosis are those tick born protozoan disease of cattle, sheep, goats, buffaloes, horses and in wild and captive ungulates caused by various species of Theilera including *Theileria annulata* and *Theileria parva*. However, indigenous cattle (*Boss indicus*) are less affected by Theileriosis than crossbred cattle. It resulted in reduced milk production, reduced weight, blood loss, damaged to hides and skins, stress and irritation and depression of immune function (Radostits *et al*., 2011; Tehrani *et al.*, 2013; Dewangan *et al*., 2015 and Morrison, 2015) [4, 19, 5, 10]. Among the various tick born haemoprotozoan disease, bovine tropical Theileriosis caused by *Theileria annulata* and transmitted by Hyaloma ticks species, results in lethal infections and considerable mortality in crossbred cattle (Radostits *et al*., 2000) [3]. Once infected the animals remain carrier for life time, since the organisms hide in macrophage and lymphoid tissue. The compromises the immune system and the animal are prone to a number of super infections. Theileriosis causes heavy economic losses in terms of high mortality, morbidity and reduced production in recovered animals (Haque *et al.*, 2010). In the field, tentative diagnosis of theileriosis is mainly based on clinical signs and tick infestation on the infected animals. In this present investigation, confirmation of the diagnosis of theileriosis in bovines depends on microscopic examination of Giemsa-stained thin blood smears. The Koch's blue bodies were found in the lymphocytes and monocytes of the lymph node smear or peripheral blood film which is pathognomonic of the disease. Muller *et al.*, 2015 [11] concluded that from 1980 to till now, Buparvaquone is the most specific drug used against theileriosis in bovines.
The present communication describes with efficacy of antitheilerial (Buparvaquone) and haematinic agents (Iron Sorbitol Citric acid complex 50 mg + Folic Acid 500 mg + Hydroxocobalamin Acetate 50 mg per milliliter).

Case History

In present investigation, 5 clinical cases of Theileriosis in crossbred cattle calves recorded at Veterinary Clinical Complex, Post Graduate Institute of Veterinary Education & Research, Jaipur (Raj.) during October, 2018 to November, 2018. The all information pertaining to age, sex, breed, season and other parameters was recorded and clinical manifestation observed and examined in respect of duration of illness, body temperature, pulse rate, respiration rate and color of mucous membrane, lymph node size, skin and hair coat, body condition were critically examined for presence of ticks.

Haematological examination revealed haemoglobin was very low in the range of 3.2-6.4 g/dl, neutrophilia, lymphocytopinea and also examined blood smear with direct blood collection from ear vein for the blood parasite.

The clinical diagnosis was established by the presence of high temperature, swelling of superficial lymph node (Parotid lymph node and prescapular lymph node and presence of small round or oval shaped piroplasm in erythrocytes.

Three crossbred cattle calves were treated with a single dose of Buparvaquone @ 2.5 mg/ Kg body weight deep, intramuscularly and 2 crossbred cattle calves were treated with Diminazine Aceturate @ 3.56 mg/Kg body weight. In supportive therapy, Oxytetracycline @ 5-10 mg/ml body weight, haematinic consists of Iron Sorbitol Citric acid complex 50 mg + Folic Acid 500 mg + Hydroxocobalamin Acetate 50 mg per milliliter @ 1 ml/50 Kg body weight intramuscularly included Dextrose 5% @ 20ml/Kg/Day, Thiamine+ Pyridoxine + Cynocobalamine @ 5-10 ml intramuscularly or intravenously and phenramine maleate @ 0.5-1.5 mg/Kg body weight and also advised for beet in feeding for increasing the haemoglobin.

After the treatment schedule, on fifth day, body temperature, appetite, skin and hair coat, color of mucous membrane and respiration rate were restored to normal in 3 cases but no showed improvement in two case in which used Diminazine Aceturate.

Fig 1: Enlarged left prescapular lymph node in Bovine Theileriosis condition

Fig 2: Whitish vaginal mucous membrane

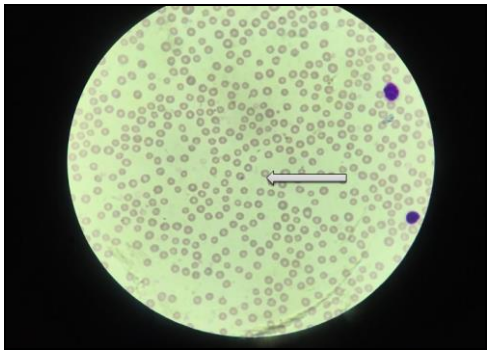

Fig 3: Photomicrograph showing piroplasm of Theileria spp. in RBC's

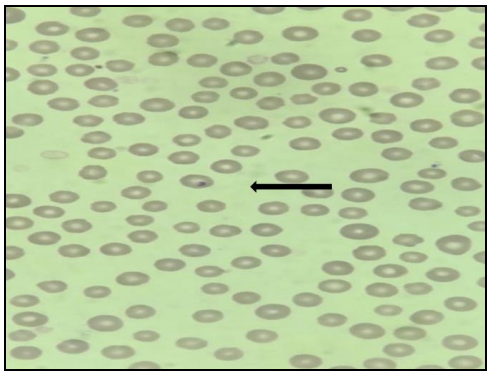

Fig 4: Photomicrograph showing piroplasm of Theileria spp. in RBC's

Result and Discussion

Based on production and economically, rearing of crossbred cattle in India because that crossbred cattle is beneficial and important to farmers according to production and economic (BAHS, 2012) [1]. The major disadvantage is poor adaptability to environment and feeding conditions in crossbred cattle and thus crossbred cattle could be more prone to disease especially haemoprotozoan disease (Theileriosis) because of presence of more exotic blood (Rup *et al.*, 2004) [17].

In present investigation, the first visible sign observed was rise in body temperature (104.2°F) with palpable enlargement of the prescapular lymph nodes and parotid lymph nodes. Since the ticks were found attached to the ear region and the enlargement of lymph node could be attributed to development stages of the parasites (Radostits *et al.*, 2007) [5], Soulsby (1982) [18] also reviewed that the disease commences with fever and after the onset of fever animals cease to eat. Tachycardia observed in present investigation could be attributed anaemia and support the findings of Dhar *et al*., (1986) [6], Bhojne *et al.*, (2010) [2], Osman and Al-Gabary, (2007) [12] and Wael and Emad, 2009 [21]. The icteric and pale or whitish visible mucous membrane (Branco *et al.*, 2010) [3] and (Kohli *et al.*, 2014) [9] in the present study are aptly due to excessive haemolysis and are evidenced by hematuria.

Haematological examination revealed that there is significant decrease of haemoglobin, neutrophilia and lymphocytopenia. Similar findings have also been reported by Ugalmugle *et al.*, (2010) [20], Ghanema *et al.*, (2013) [8] and Ramazan and Ugur, (2006) [16].

Though many drugs and drug combinations Diminazine Aceturate along with Oxyteteracycline and other had been used from time to time to treat bovine Theileriosis but none of them was fully effective in 2 cases.

Among many drugs evaluated Buparvaquone was found very

effective and highly specific for the treatment of bovine Theileriosis at an early as wellas late stage of infection in 3 cases. Single shot of Buparvaquone was sufficient for bovine Theileriosis and no side effects of the drug were observed. To combat anemic changes haematinics drugs with also advised of beet for increasing haemoglobin level as a supporative therapy were also prescribed. Similar findings have also been reported by Dhar *et al*., (1987) [7].

Conclusion

Theileriosis are those tick born protozoan disease of domestic animals and capative ungulates caused by various theilera species. In Theileriosis condition, best drug of choice is Buparvaquone. There should be give supportive treatment with haematinic agents (Iron Sorbitol Citric acid complex 50 mg + Folic Acid 500 mg + Hydroxycobalamin Acetate 50 mg per milliliter), antibiotic and Ivermection for prevention of Theileriosis.

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