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Therapeutic management of theileriosis in cross-bred cattle

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Abstract

Blood sample was collected from the affected animal for the presence of suspected haemoprotozoan infection and to record the haematological status. Blood smear examination revealed presence of *Theileria annulata* infection. Crossbred cattle was treated with Buparvaquone at dose rate of 2.5 mg/kg body weight intramuscularly and repeated after 7 days along with supportive therapy. After treatment, the clinical signs disappeared and animal health status improved. The observation showed successful treatment of the animal.

Keywords: *Theileria annulata*, crossbred cattle, blood smear and buparvaquone

1. Introduction

Bovine Tropical Theileriosis is one of the most prevalent diseases of cross bred cattle caused by *Theileria annulata* [1]. It is one of the most economically important vector-borne diseases of tropical and subtropical parts of the world including India [2]. Generally it occurs in hot and humid climate which is highly favourable for the development of ticks. Ixodid ticks of the genera *Hyalomma* and *Rhipicephalus* are foremost vectors that are involved in transmission of theileria [3]. Transmission of theileria organism from one stage to another stage is by transtadial transmission. Theileriosis is usually serious challenge to the exotic cross bred cattle but mostly not in indigenous cow. The disease entity may be acute, sub-acute and chronic. The acute disease occurs in all breeds and all ages of cattle as well as buffalo and zebu cattle [4]. The present case report demonstrates history, clinical manifestation, diagnosis and treatment of Theileriosis in cross bred cattle.

2. Case history and Clinical observations

An eighteen month old cross bred cattle was presented in Teaching Veterinary Clinical Complex of College of veterinary Science and Animal Husbandry, Kumarganj, Ayodhya, Uttar Pradesh, India in October, 2019. Primary complaints of the owner were in-coordination from hind legs and high fever of the animals for last one month, although feeding and water intake was normal. As per owner, animal was already treated by Dextrose (20%), Berenil (20 ml) and Melonex (30 ml) before 15 days. There had been no response to this treatment and condition of the animal deteriorated over the last one week.

At the time of observation, the animal was very dull and depressed. The clinical examination of the animal showed a marked rise in body temperature was 104.4°F, a slight pale visible mucous membranes, pre-scapular lymphadenitis, tick infestation, respiratory rate 22/minutes, heart rate 67/ minutes, lacrimation nasal discharge and incoordination (Fig. 1)

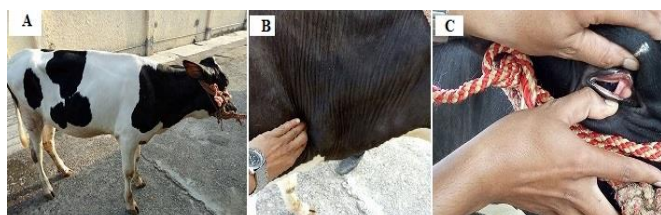


Fig 1: (A) Dull and depressed crossbred cattle. (B) Enlarged of pre-scapular lymph node. (C) Pale mucus membrane of eye.

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3. Diagnosis and Treatment

On the basis of clinical observation, animal was suspected of haemoprotozoan infection. Giemsa stained blood smear was examined for the demonstration of parasite. Hematological parameters were also assessed using auto analyser (Celltac alpha, Nihon Kohden) as a guiding tool for infection.

On the basis of microscopic examination of Giemsa stained blood smear, piroplasm of *Theileria annulata* was found in Red Blood cells (Fig.-2). The affected animal was then treated with Zubion (Buparvaquone) at a dose rate of 2.5 mg/kg body weight intramuscularly and repeated after 7 days. As a supportive therapy, meloxicam (melonex) at a dose rate of 0.2 mg/kg body weight intramuscularly daily for 3 days, 5 ml of multivitamin injection (Intavita) intramuscular three times at weekly interval and 10 ml of Iron injection were administered to the animal. Topical application of synthetic pyrethroid (Deltamethrin) spray on animal body was also advised. After two weeks of treatment, the body temperature returned to normal and clinical signs like in-coordination disappeared.

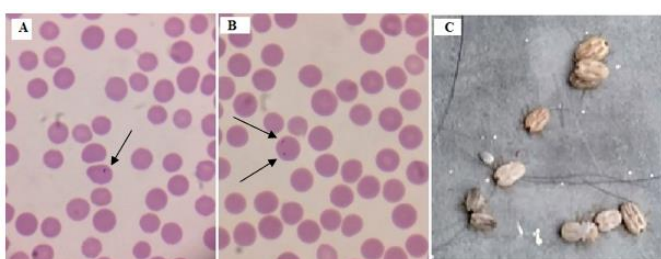


Fig 2: (A) Blood smear showing Intra erythrocytic Piroplasm, *Theileria annulata* at 100X. (B) Two piroplasms in a single RBC at 100X. (C) Ticks collected from infected animal.

4. Results and Discussion

The values of haematological parameters were Haemoglobin 6.6g/dL, PCV 22.8%, RBC $6.8 \times 10^6/\mu\text{l}$ whereas White blood cell count, Granulocytes, Lymphocytes and Monocytes were $14.4 \times 10^3/\mu\text{l}$, $12.68 \times 10^3/\mu\text{l}$, $1.12 \times 10^3/\mu\text{l}$ and $0.6 \times 10^3/\mu\text{l}$ respectively before treatment of affected animal. From day 14th post treatment, a remarkable improvement was noticed in the clinical condition. As per owner's report, the animal regained its normal appetite within 7 days post treatment. Health status of aforesaid animal was recovered after the administration of Buparvaquone with supportive therapy^[5, 6]. Buparvaquone is a promising anti-theilerial drug for chronically infected dairy cattle as well as may have dual effect of reducing the pathogenic effects of piroplasmosis as well as restoration of an impaired immune system of affected cattle^[7]. In the present study, double dose of Buparvaquone was very effective against theileriosis in cattle. Double dose of Buparvaquone given at the rate of 2.5 mg/kg body weight intramuscular was also reported earlier to be effective in clearing the piroplasm and restoration of normal health status of animals^[8]. Decrease in haematological status in *Theileria annulata* infection has also been reported by several authors previously^[19]. A normocytic normochromic anaemia reported by some authors in *Theileria annulata* infected cross bred cattle due to both an autoimmune reaction and the effect of intra-erythrocytic piroplasms^[10-12]. Development of progressive anaemia is also attributed to erythrophagocytosis by macrophages during high piroplasmic parasitaemia in cross bred cattle^[13]. Some workers believed that over production of cytokines and reactive oxidant may induce progressive anaemia due to erythrocytic oxidative stress^[14]. In the present study, administration of Iron and Vitamins

(antioxidant) as supplement might have also helped in reducing the oxidative stress effect on erythrocytes destruction as reported by several workers^[15-17]. The restoration in haematological indices and regaining of normal health condition suggest successful treatment of the *Theileria annulata* infected animal.

5. Conclusion

Double dose of Buparvaquone (2.5 mg/ kg body weight intramuscularly) given at seven days interval was effective in curing the cross bred cattle of *Theileria annulata* infection. The animal regained its haematological status and clinical signs like fever and anorexia disappeared.

6. Acknowledgement

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