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Diagnostico-therapeutic management of theileriosis affected cross-bred cattle

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Abstract
A case of HF cross-bred cattle of seven years old with history of ticks, fever, reduced feed and water intake, bilateral nasal discharge, lacrimation, six months pregnant was presented to VCC Navania. On clinical examination revealed high body temperature, increased respiration, tachycardia with enlarged lymph nodes. It was suspected for Theileriosis and different laboratory diagnoses were performed. Smear was made from peripheral blood sample. On Giemsa staining Koch blue bodies were identified in the lymphocytes. Haematological parameters were done using peripheral blood samples. RBC`s, WBC`s, haemoglobin and packed cell volume found decreased as compared to normal values. The present case report showed that Theileria infection in cattle might be associated with haematological changes and successfully treated with single dose of Inj. Buparvoquone (2.5 mg/kg i.m.) and Inj. Oxytetracycline for next three days along with supportive therapy.

Keywords: theileria, koch blue bodies, haematological parameters, buparvoquone

Introduction
Bovine *Theileriosis* is one of the most prevalent and economically significant diseases of cattle and buffaloes (Forsyth *et al*., 1997) [4]. It has huge economic impact on livestock, affecting around 80% world population of cattle and causes severe economic loss because of morbidity and mortality (Kasozi *et al*., 2014) [10]. Theileria are obligate intracellular protozoan parasites. It infects both wild and domestic animals throughout the world. In life cycles of Theileria both invertebrate and vertebrate hosts are involved and it is transmitted by vectors like ticks of family Ixoxidae (Khan *et al*., 2004; Piyumali *et al*., 2013) [11, 18]. Out of six identified Theileria species *Theileria annulata* and *Theileria parva* are the most important pathogenic species which causing theileriosis in bovine (Kohli *et al*., 2014) [12]. *Theileria parva* causes East Coast fever in eastern & southern Africa, while *Theileria annulata* causes tropical theileriosis in southern Europe, North Africa and Asia. The incubation period varies from 4 to 14 days and disease may last for three to four days in the acute form or may be prolonged for around 20 days (Durrani *et al*., 2008) [2].

The major clinical signs associated with theileriosis include fever (>40 ºC), enlarged lymph nodes (parotid, prescapular and prefemoral), haemolytic anaemia, lethargy, weakness, jaundice, tachycardia, increased respiratory rates, mortality, abortions and stillbirths (Eamens *et al.* 2013) [3]. According to Islam *et al*., 2017 [9] anorexia, slight nasal & ocular discharge, congested conjunctiva and salivation. In some cases constipation, diarrhoea, pale mucous membranes, milky infiltration of the cornea, dyspnoea, coughing, pulmonary oedema and nervous manifestations (hyperesthesia, convulsions, head pressing, tremors and paddling prior to death). In cattle the pathological damage is induced by schizont stage of theileria (Bishop *et al.*, 2004) [1]. Schizonts infected cells induce huge and uncontrolled proliferation of both specific and non-specific T-lymphocyte results in enlarged lymph nodes (Schneider *et al.*, 2007) [20]. Hemolytic anemia is the characteristic of tropical theileriosis (Omer *et al.*, 2002) [17]. According to Shiono *et al.*, 2004 the cause of hemolytic anemia may be immune mediated hemolysis still underlying mechanism is not yet fully understood.

In acute cases of theileriosis the diagnosis is mainly based on the clinical findings and microscopic examination of stained thin blood smears. Theileriosis recovered cattle harbor piroplasm in latent form, so they act as reservoir for perpetuating infection to ticks and cattle herds (Thompson *et al.*, 2008) [24]. These recovered cattle from acute infection have low parasite level that is not detecting microscopically (Hoghooghi-Rad *et al.*, 2011) [7]. Such cattle

and act as reservoir for infection. Theileriosis have global distribution because of their vectors like ticks and blood sucking flies also distribute globally. Theileriosis act as a challenge to successful livestock farming and cause huge losses to the livestock industry throughout the world.

History and observations

Seven year old HF cross-bred cattle was presented to VCC Navania, Vallabhnagar, Udaipur with history of ticks over the body, fever, anorexia and dyspepsia since three days, bilateral nasal discharge, lacrimation, six months pregnant with loss of body condition. Detailed clinical examination revealed high body temperature (105.8 ˚F), tachycardia (98 beats/minute), increased respiration (42 breaths/min), enlarged prescapular lymph nodes, rough skin coat, moderate dehydration, decrease ruminal motility, pale mucous membrane. The cattle was observed and treated accordingly for five days in the indoor shed of VCC.

Material and Methods

Blood collection

Blood sample was collected aseptically from the jugular vein in vacutainers containing EDTA, as anticoagulant. The samples were immediately transported to the laboratory for parasitological and haematological examinations.

Blood examination

In the present study the disease was diagnosed based on clinical observations and laboratory confirmation by preparation of thin blood smears using fresh peripheral blood sample. A small drop of blood was placed over the slide, smeared gently and air dried. The blood smear was fixed for two minutes in absolute methyl alcohol, stained in diluted (1:9) Giemsa stain for 45 minutes, washed in distilled water and air dried (Soulsby, 2005) [23], on microscopic examination under oil immersion (100X) revealed Koch blue bodies in the cytoplasm of lymphocyte (Fig.1.).

Hematological study

Blood sample was subjected for haematological examination, which is done by using haematological auto analyser (IDEXX Vet Autoread), revealed decrease in Hemoglobin (5.8 g%), Packed Cell Volume (16.5%), WBC ($3.4X10^9$/l), granulocytes ($1.0X10^9$/l), Lymphocyte/Monocyte ($2.4X10^9$/l) and increase mean corpuscular haemoglobin concentration (35.2 g/dl).

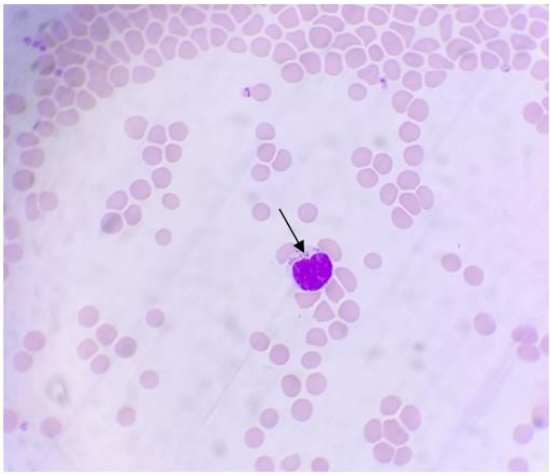

Fig 1: Blood smear showing Koch blue bodies (arrow) in cytoplasm of Lymphocytes.

Therapeutic management and discussion

On the basis of signs and symptoms, blood smear and haematological examination the cattle diagnosed as affected with theileriosis so, it was treated with single dose of Anti-theilerial drug inj. Buparvoquone (Butalex) @ 2.5mg/kg BW deep IM and subsequently inj. Oxytetracycline @ 10mg/kg BW IV for next three days along with supportive therapy. Supportive therapy comprised of Inj. NS @ 2000 ml IV, Inj. Meloxicam plus @ 1.5ml IM for 3 days, Inj. Ferritas @ 10ml IM single dose, Bol. Ferritas @ 2 bolus PO BD for 3 days. This is in accordance with Gupta *et al.*, 2004 [5] Naik *et al.*, 2010 [14] and Ngumi *et al*., 1992 [16] who used Buparvoquone along with supportive therapy for the successful treatment.

The cattle responded after 2nd day of treatment, 3rd day temperature came down to almost normal. Rashid *et al.*, (2010) [19] observed that the level of hemoglobin, PCV and TLC was reduced in infected animals which was in accordance with the present findings. According to Sekar *et al.*, 2009 [21] theileriosis revealed low hemoglobin concentration and TLC with lymphocytosis. Cattle infected with Theileriosis had lower values of total RBC, Hb and PCV (Omer *et al*., 2002; Hasanpour *et al*., 2008; Nazifi *et al*., 2009; Khan *et al*., 2011) [17, 6, 15, 4]. The cattle showed clinical recovery on 3rd day of treatment and regained its normal appetite, marked decreased in swelling of prescapular lymphnodes. In early stages of clinical disease treatment with Parvaquone or its derivatives like buparvaquone is highly effective but is less effective in advanced stages of disease when extensive destruction of haematopoietic and lymphoid tissues occur (Merck, 2005) [13]. It could ascertain that timely diagnosis and specific treatment is the key needed for successful therapy.

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