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Therapeutic management and clinical recovery in buffalo theileriosis

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Abstract

This study reports the clinical manifestation, diagnosis, and successful therapeutic management of theileriosis in a six-year-old buffalo. The animal presented with high fever (105°F), anorexia, lymphadenopathy, nasal discharge, brisket edema, and pale mucous membranes. Microscopic examination of a Giemsa-stained peripheral blood smear revealed *Theileria annulata* piroplasms and Koch's blue bodies, confirming the diagnosis. Supportive therapy combined with a single intramuscular injection of buparvaquone (2.5 mg/kg body weight) led to rapid clinical improvement. Hematological parameters were monitored before and after treatment. The buffalo responded favorably within two days, showing marked recovery. The study highlights the importance of early diagnosis, appropriate chemotherapy, and supportive care in the management of tropical theileriosis in buffaloes.

Keywords: *Theileria annulata*, Buparvaquone, buffalo, hematology, treatment

Introduction

Theileriosis is a significant tick-borne disease affecting domestic and wild bovines, caused by apicomplexan protozoan parasites of the genus *Theileria* (family Theileriidae). These are obligate intracellular organisms transmitted primarily through ixodid ticks. Several species of *Theileria* have been identified worldwide, including *T. annulata*, *T. parva*, *T. mutans*, *T. orientalis*, *T. buffeli*, and *T. velifera*. Among them, *T. annulata* and *T. parva* are the most pathogenic, causing tropical and East Coast fever-type theileriosis, respectively. *Theileria annulata* is responsible for tropical theileriosis in cattle and buffaloes and was first described by Dschunkowsky and Luhs in 1909, following the discovery of East Coast fever by Arnold Theiler in 1904.

In India, *Hyalomma anatolicum anatolicum* is the principal vector transmitting the disease (Samad & Hossain, 1975) [8]. The infection is endemic in tropical and subtropical regions, particularly in Gujarat, Rajasthan, Punjab, Haryana, and Maharashtra. The disease is most prevalent during the monsoon and post-monsoon periods, coinciding with the peak activity of tick populations. Theileriosis leads to considerable economic losses due to reduced milk production, poor growth, weight loss, infertility, mortality, and expenses related to treatment and control (Ghosh *et al.*, 2017) [4]. High-yielding dairy buffaloes are especially susceptible during periods of heavy tick infestation.

The incubation period generally ranges from 4 to 14 days after the attachment of infected ticks. Clinically, infected buffaloes exhibit high fever (104-105°F), anorexia, and enlargement of superficial lymph nodes, particularly the parotid, prescapular, and prefemoral nodes. Other signs include excessive salivation, conjunctival congestion, nasal and ocular discharge, constipation followed by dark, tarry diarrhoea, and pale mucous membranes. In severe cases, respiratory distress, pulmonary oedema, and neurological symptoms such as hyperaesthesia, convulsions, and paddling movements may occur before death. Diagnosis is typically based on clinical signs and microscopic detection of piroplasms or schizonts in Giemsa-stained blood smears, while chronic or carrier cases are more accurately identified using molecular techniques such as Polymerase Chain Reaction (PCR).

The present study reports a clinical case of *Theileria annulata* infection in a buffalo, confirmed through hematological and microscopic examination, and successfully managed with buparvaquone along with supportive therapy.

Materials and Methods

Blood collection

During clinical examination, the animal was dull and depressed with emaciated body condition, the conjunctival and vaginal mucous membranes were icteric with petechial haemorrhage (Figure 1), enlarged prescapular lymph node (Figure 2) along with tick infestation in ear, but the rectal temperature was normal (38.3 °C). The vital clinical parameters like heart rate (102 bpm), respiratory rate (40 breaths/min) and pulse rate (60/min) were observed. Based on general clinical examination the case was diagnosed as haemoprotozoal disease. 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 was performed in before treatment, after 5th and 10th day post treatment.

Clinical History and Examination

A six-year-old female buffalo was presented to the Veterinary Clinical Complex, Junagadh, with a ten-day history of high fever (105 °F), anorexia, nasal discharge, agalactia, brisket oedema, and heavy tick infestation. On physical examination, the animal appeared dull, depressed, and emaciated, with pale mucous membranes, rough hair coat, dyspnoea, brisket oedema, and enlarged prescapular lymph nodes. Based on these clinical signs, haemoprotozoan infection was suspected, and further laboratory investigations were conducted.

Blood Collection and Microscopic Examination

Blood samples were aseptically collected from the jugular vein into ethylenediaminetetraacetic acid (EDTA) vacutainers for haematological and microscopic analyses. Thin blood smears were prepared from fresh peripheral blood, air-dried, fixed in absolute methanol for two minutes, and stained with

10% Giemsa stain for 45 minutes following the method described by Soulsby (2005) [14]. The stained smears were rinsed with distilled water, air-dried, and examined microscopically under oil immersion (100×). Examination revealed intraerythrocytic piroplasms and Koch's blue bodies-characteristic of *Theileria annulata* infection (Figure 3).

Hematological Analysis

Haematological evaluation was performed using an IDEXX Vet Auto Analyzer. Parameters assessed included haemoglobin concentration, packed cell volume (PCV), total erythrocyte and leukocyte counts, platelet count, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), and differential leukocyte counts (neutrophils, lymphocytes, monocytes, and eosinophils). Blood samples were analysed prior to treatment and subsequently on the 5th and 10th days post-treatment to monitor clinical recovery.

Diagnosis

The diagnosis of tropical theileriosis was confirmed based on the combination of characteristic clinical manifestations-including high fever, lymph node enlargement, anaemia, and oedema-with the microscopic detection of *T. annulata* piroplasms and Koch's blue bodies in Giemsa-stained blood smears.

Treatment Protocol

The affected buffalo was treated with buparvaquone (Butalex[®]) administered intramuscularly at a dosage of 2.5 mg/kg body weight as a single dose. Oxytetracycline (OTC) was given intramuscularly at 10 mg/kg body weight daily for five consecutive days to control secondary bacterial infections. Supportive therapy included Vetalgine[®] (10 mg/kg IM for three days) as an antipyretic and analgesic, Avil[®] (10 ml IM for three days) as an antihistamine, Tonophosphate[®] (20 ml IM for five days) as a metabolic stimulant, and Repronol[®] (10 ml IM for three days) to enhance recovery. Additionally, liver tonics and haematinic supplements were administered for seven days to aid haematological restoration.

Table 1: Hematological alterations in buffaloes infected with *Theileria* spp

Parameter	Result	Reference Range	Remarks
Haemoglobin (g/dl)	11	8-14	Normal
PCV (%)	41.5	24-44	Normal
RBC (× 10 ⁶ µl)	8.61	5-9.5	Normal
MCV (fl)	48	40-60	Normal
MCH (pg)	12.8	10-17	Normal
MCHC (g/dl)	26.5	30-34	Lower
Platelets (× 10 ⁵ µl)	1.91	1-10	Normal
WBC count	2048	4000-11000	Lower
Neutrophils (%)	55	15-45	Higher
Lymphocytes (%)	44	40-75	Normal
Monocytes (%)	1	2-8	Lower
Eosiniphils (%)	0	1-15	Lower

Results and Discussion

The buffalo exhibited rapid improvement following buparvaquone administration. Body temperature normalized within 24 hours, appetite returned by the second day, and brisket edema regressed within five days. Such results concur with findings by Sharma *et al.* (1984) [10] and Singh *et al.* (2017) [12], who reported the high efficacy of buparvaquone in treating tropical theileriosis. Initial hematological examination revealed anemia and leukopenia (Hb: 11 g/dL; PCV: 41.5%;

WBC: 2048/µL). Neutrophilia (55%) was observed, reflecting an inflammatory response, while lymphocyte count remained within normal limits. These alterations are consistent with the anemia and immunological suppression typical of *Theileria* infections (Bhat *et al.*, 2020) [1]. After treatment, hematological parameters progressively improved, indicating recovery of hematopoietic function. Buparvaquone, a hydroxynaphth-oquinone derivative, acts by inhibiting the electron transport chain in *T. annulata* schizonts and is

considered the most effective anti-theilerial drug (Singh *et al.*, 2014) ^[11]. The addition of oxytetracycline provides secondary

protection against bacterial infections and assists in managing associated pyrexia and stress.



Fig 1 & 2: Clinical presentation of *Theileria* in infected buffalo

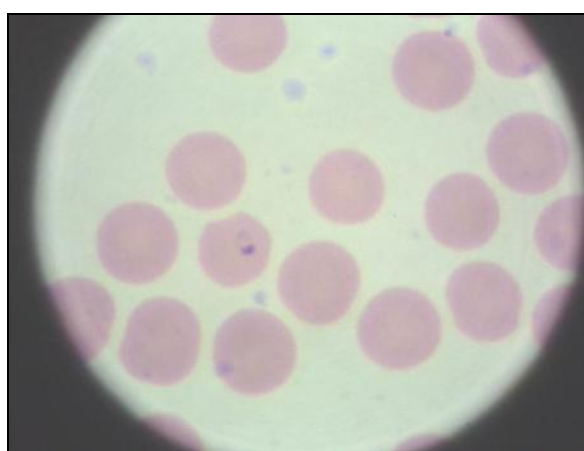


Fig 3: Intracellular *Theileria* spp. parasite on Giemsa stain blood smear

Conclusion

The buffalo exhibited rapid improvement following buparvaquone administration. Body temperature normalized within 24 hours, appetite returned by the second day, and brisket edema regressed within five days. Such results concur with findings by Sharma *et al.* (1984) ^[10] and Singh *et al.* (2017) ^[12], who reported the high efficacy of buparvaquone in treating tropical theileriosis. Initial hematological examination revealed anemia and leukopenia (Hb: 11 g/dl; PCV: 41.5%; WBC: 2048/ μ L). Neutrophilia (55%) was observed, reflecting an inflammatory response, while lymphocyte count remained within normal limits. These alterations are consistent with the anemia and immunological suppression typical of *Theileria* infections (Bhat *et al.*, 2020) ^[1]. After treatment, hematological parameters progressively improved, indicating recovery of hematopoietic function. Buparvaquone, a hydroxynaphth-oquinone derivative, acts by inhibiting the electron transport chain in *T. annulata* schizonts and is considered the most effective anti-theilerial drug (Singh *et al.*, 2014) ^[11]. The addition of oxytetracycline provides secondary protection against bacterial infections and assists in managing associated pyrexia and stress.

Conflict of Interest

Not available

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Reference

1. Bhat SA, Singh H, Singh NK, Rath SS. Economic losses due to haemoprotozoan diseases in bovines in India. *Vet World*. 2020;13(9):1923-1930. <https://doi.org/10.14202/vetworld.2020.1923-1930>
2. Dschunkowsky E, Luhs G. Tropical theileriosis in cattle. *Zentralbl Bakteriol Parasitenkd Infektionskr*. 1909;50:78-90.
3. Feng X, Li Y, Zhang W, Chen L, Zhao H. Rapid and sensitive detection of bovine *Theileria annulata* via enolase gene and ERA-CRISPR/Cas12a system. *Front Microbiol*. 2025;16:1647929. <https://doi.org/10.3389/fmicb.2025.1647929>
4. Ghosh S, Nagar G, Sharma AK. Economic impact of haemoprotozoan diseases of livestock in India. *Indian J Anim Sci*. 2017;87(1):123-130.
5. Minjauw B, McLeod A. Tick-borne diseases and poverty: The impact of ticks and tick-borne diseases on the livelihoods of small-scale and marginal livestock owners in India and eastern and southern Africa. Edinburgh: DFID Animal Health Programme, Centre for Tropical Veterinary Medicine, University of Edinburgh; 2003.
6. Molecular epidemiology and genotypic diversity of *Theileria annulata* in bovines from Haryana, India. *Parasitol Res*; 2025, p. 1-8. PubMed ID: 40178641. <https://doi.org/10.1007/s00436-025-40178641>
7. Roy S, Bansal R, Singh A. Population genetic analysis of *Theileria annulata* parasites from India. *Front Microbiol*.

- 2020;11:579929.
<https://doi.org/10.3389/fmicb.2020.579929>
8. Samad MA, Hossain MA. Role of Hyalomma anatolicum as vector of Theileria annulata in India. Indian J Vet Med. 1975;19(2):73-8.
 9. Sergeant E, Donatien A, Parrot L, Lestoquard F. Études sur les piroplasmoses bovines. Alger: Institut Pasteur d'Algérie; 1927.
 10. Sharma AK, Bhushan C, Gautam OP, Sangwan AK. Development of an attenuated schizont vaccine for Theileria annulata in India. Indian J Comp Microbiol Immunol Infect Dis. 1984;5(3):187-193.
 11. Singh A, Sharma AK, Kumar R, Sharma N. Emergence of buparvaquone resistance in Theileria annulata isolates from India. Vet Parasitol. 2014;205(1-2):21-29.
<https://doi.org/10.1016/j.vetpar.2014.06.009>
 12. Singh H, Kaur P, Gill JS, Rath SS. Impact of tropical theileriosis on milk production in crossbred cattle and buffaloes in Punjab, India. Indian J Anim Res. 2017;51(3):533-536.
 13. Singh R, Kumar A, Yadav P, Sharma D. Hematological and biochemical alterations in Theileria annulata infected buffaloes and therapeutic management. Vet Parasitol. 2021;293:109452.
<https://doi.org/10.1016/j.vetpar.2021.109452>
 14. Soulsby EJJ. Helminths, arthropods and protozoa of domesticated animals. 7th Ed. London: Baillière Tindall; 2005.
 15. Theiler A. Zur Aetiologie des sogenannten East Coast Fever. Zentralbl Bakteriell Parasitenkd Infektionskr. 1904;37:593-604.

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