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Short Communication

Bovine cerebral theileriosis in crossbred calf and successful management- A case report

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Abstract

A female cattle calf of one month old was presented to the Veterinary Clinical Complex, Bihar Veterinary College, BASU, Patna with a complaint of inappetence, frequent upward and right lateral movement of the head and inability to search udder for milk. The animal showed ataxia (in coordinated gait) with abducted limbs, blindness, mild enlarged pre-scapular lymph nodes and pale mucous membranes. Initially, the treatment was started with intravenous (I/V) injection of mannitol and intramuscular (I/M) injection of vitamin B1 and prednisolone for 3 days without substantial improvement in clinical signs. Microscopic examination of Giemsa-stained thin blood smears revealed piroplasms in erythrocytes, and the case was confirmed as a cerebral form of theileriosis. The treatment was continued with a single dose of buparvaquone followed by oxytetracycline in 100 mL NS administered intravenously daily for five days along with supportive therapy for ten days. It is important to note that, if cattle are showing nervous symptoms along with anaemia, then it should be diagnosed to rule out the possibility of theileria infection. Thus, this study may aid field veterinarians in managing such cases effectively.

Keywords: Buparvaquone, Calf, Neurological signs, Theileriosis

Highlight

- Bovine cerebral theileriosis is a very atypical nervous form with circling movements in cattle.
- *Theileria parva*, *Theileria taurotragi* and *Theileria annulata* are considered to be their causative agents.
- The regimen of buparvaquone along with supportive therapy could be effective and successfully managed against the cases of cerebral theileriosis if diagnosed at the earliest.

Bovine cerebral theileriosis, also known as turning sickness, is an atypical form of infection that rarely manifests as typical turning and circling movements. However, the symptoms of depression, head pressing, opisthotonus, nystagmus, blindness, hyperaesthesia, dysmetria, dyssynergia, and terminal semicomatose status are often also observed (Agrawal *et al*., 2023). *Theileria parva*, *Theileria taurotragi* and *Theileria annulata* are considered to be its causative agents (Catalano *et al*., 2015). Clinically, the disease is manifested by one or more of the nervous signs including ataxia, hypermetria, conscious proprioceptive deficits, circling, depression, head pressing, opisthotonos, nystagmus, blindness, hypersthenia and convulsions (Kaleibar *et al*., 2014). Since, this is an aberrant form of the disease associated with *T. annulata* and scanty reports are observed from time to time by many workers in India (Agrawal *et al*., 2023). The present communication describes the clinical management of a calf with cerebral theileriosis.

A female cattle calf aged about one month was presented to the Veterinary Clinical Complex, Bihar Veterinary College, BASU, Patna with a complaint of inappetence, frequent upward and right lateral movement of head and inability to search udder for milk. On clinical examination, the calf showed a rectal temperature of 101.3°F, heart rate of 92 beats per minute, respiration rate of 28 breaths per minute, blindness, mild enlarged pre-scapular lymph nodes and pale mucous membranes (Fig. 1). In addition, the animal exhibited frequent upward and right lateral movements of head, ataxia (in coordinated gait) with abducted limbs. Following the routine physical examination, 3 mL of blood sample was collected from the jugular vein into an EDTA vial for blood smear preparation and haematological (Hb, PCV and TEC) estimation. Based on specific neurological signs, tentatively the

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Fig. 1. Calf showing upward and lateral deviation of head

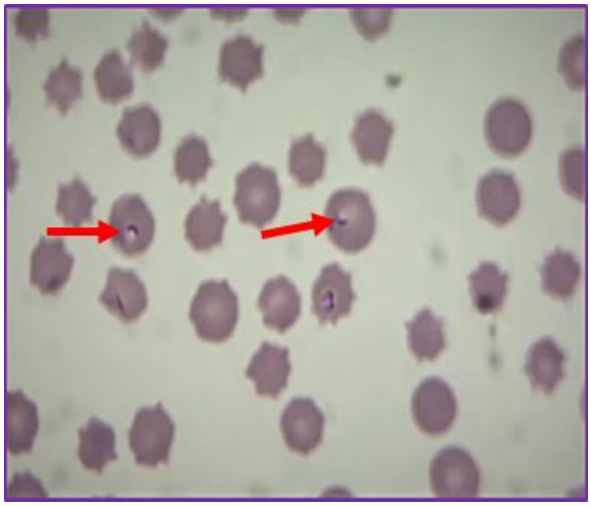

Fig. 2. Blood smear showing *Theileria* piroplasm in RBCs (arrow)

case was diagnosed with cerebral syndrome associated with thiamine deficiency (polioencephalomalacia).

Keeping in mind the need for immediate medical treatment, the treatment was initiated with mannitol (PSK-Manitol, PUNISKA) @ 1 g/kg, I/V; vitamin B1 (Beriwin, Carevet Pharma) @ 10 mg/kg, I/M and prednisolone (Prednisolone Acetate, Intervet India Pvt. Ltd.) @ 0.5 mg/kg BW I/M for 3 days to subside the neurological signs, but no marked clinical improvement was noticed. The haematological examination revealed lower values of Hb (8 g/dL); PCV (25%) and TEC (4.26 x10^6/µL) indicating anaemia. Further, examination of the blood smear revealed the presence of *Theileria* spp. piroplasm in erythrocytes (Fig. 2), and the case was confirmed for cerebral theileriosis and the treatment was continued with a single dose of buparvaquone injection @ 2.5 mg/kg, IM followed by oxytetracycline @ 10 mg/kg in 100 mL normal saline (NS), I/V daily for five days along with supportive treatment as injection of vitamin B1, B6 and B12 @ 2 mL I/M (Tribivet, Intas Pharmaceuticals Ltd.) for 5 days and syrup of mecobalamin, multivitamins and minerals @ 15 mL twice daily (Nurokind Plus Vet, Vet Mankind) for ten days. The calf responds well to the treatment and almost complete clinical recovery was observed by the two weeks of treatment.

The clinical signs of cerebral theileriosis in cattle exhibit analogous neurological signs to those of other neurological diseases like polioencephalomalacia (PEM), listeriosis and rabies. The antemortem diagnosis of PEM is frequently challenging, and a significant proportion of ruminants with cortical signs are given thiamine, and the response to therapy over 24 hours is used to predict PEM (Dore and Smith, 2016). The clinical signs exhibited by the calf were almost similar to the findings of (Kaleibar *et al*., 2014; Islam *et al*., 2017), who suggested that the nervous signs in cerebral theileriosis occur as a result of vasculitis and lymphocytic inflammation of the brain. This could also be attributed to intravascular and vascular extra-vascular aggregations of schizont-infected lymphocytes in the brain causing thrombosis and ischemic necrosis (Charaya *et al*., 2021). The calf in this case had slightly decreased packed-cell volume, haemoglobin, and red blood cells, indicating that it had mild anaemia (Reddy and Sivajothi, 2017). However, these haematological values approached normal levels after two weeks of treatment (Table 1). It is essential to diagnose the disease as early as possible for a successful outcome. Many workers have reported the ineffectiveness of buparvaquone in cerebral and advanced cases of theileriosis (Kaleibar *et al*., 2014),

Table 1. Haematological changes during pre- and post-treatment

Parameters	Pre-treatment	Two weeks post-treatment
Hb (gm/dL)	8.00	9.2
PCV (%)	25	28
TEC (x 10^6/µL)	4.26	5.2

but the present case with prescribed treatment was successful in controlling the nervous form of the disease (Bharai *et al*., 2019).

It may be concluded that a single dose regimen of buparvaquone along with supportive therapy could be effective and successfully managed against the

cases of cerebral theileriosis if diagnosed at the earliest.

Conflict of interest: Authors have no conflict of interest in this study.

Author's contribution: AK, SB, PK: Conception and designing of the study; AK, SB: Attended and documented the cases; VKS, AK, TR: Analysis of data and slide reading. Manuscript writing and final approval of the manuscript were made by all authors.

Data availability statement: Raw data of this study are available from the corresponding author.

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