

# Diagnosis and Therapeutic Management of *Trypanosoma evansi* in an American Bully with Corneal Opacity

Bhavika R. Patel<sup>1\*</sup>, Binod Kumar<sup>2</sup>, Tapas K. Patbandha<sup>3</sup>, Amrita Vasava<sup>1</sup>, Ankit S. Prajapati<sup>1</sup>

*Ind J Vet Sci and Biotech* (2025): 10.48165/ijvsbt.21.6.36

**T**rypanosomosis is a haemoprotozoan infection, caused by different members of *Trypanosoma* species. It is widely dispersed form of animal trypanosomosis that is harmful, affecting various domestic and wild animal species (Eloy and Lucheis, 2009). Most of the time, the parasite is mechanically transmitted by biting flies like *Tabanus*, *Stomoxes*, *Tsetse* and *Culicoides* (Green, 2006). Canine trypanosomosis varies in severity from acute to subacute and chronic form. Dogs are frequently affected by an acute and severe form, which may result in death within two to four weeks (Soulsby, 1982). The clinical manifestations of canine trypanosomosis include weight loss, growing weakness, anorexia, anaemia, intermittent fever, conjunctivitis, swelling of the head, throat and limbs, staggering gait, enlarged superficial lymph nodes, difficulty in swallowing and corneal opacity due to strong reactions from the immune system (Kumar *et al.*, 2020). One of the main symptoms of this condition is anaemia, which is caused by the mononuclear phagocytic system expelling red blood cells from the bloodstream. After an infection lasting several months, anaemia may recover to varying degrees when the parasitaemia becomes low and sporadic (Urquhart *et al.*, 2002). The World Animal Health Organization currently classifies *T. evansi* as a multi-species illness and a zoonotic disease, following the clinical case reports of human trypanosomosis in Egypt and India (Aregawi *et al.*, 2019).

A single dose of diminazene aceturate is sufficient to eradicate a trypanosomosis infection in dog (Agrawal *et al.*, 2020); however there are several more efficient trypanosomacidal medicines for dogs, such as suramin and quinapyramine (Rani and Suresh, 2007). Giving diminazene diacetate to dogs at a dose rate higher than 3.5 mg/kg body weight is deemed lethal (Han *et al.*, 2014). In India, the occurrence of canine trypanosomosis is sporadic in nature (Behera *et al.*, 2017). However, no report on canine trypanosomosis with ophthalmic involvement has been reported in western India in particular Gujarat. Therefore, the present case report documents on the clinical presentations, diagnosis, haemato-biochemistry and therapeutic management of trypanosomosis in an American bully dog from Gujarat.

<sup>1</sup>Department of Veterinary Clinical Complex, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Anand 388001, Gujarat, India

<sup>2</sup>Department of Veterinary Parasitology, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Junagadh Campus, Gujarat, India (Now at CoVSc, Bihar Animal Science University, Kishanganj-855107, Bihar, India)

<sup>3</sup>Polytechnic in Animal Husbandry, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Junagadh Campus, Gujarat, India

**Corresponding Author:** Dr. Bhavika R. Patel, Assistant Professor, Department of Veterinary Clinical Complex, College of Veterinary Science & AH, Kamdhenu University, Anand-388001, Gujarat, India. e-mail: bhavika.patel@kamdhenuni.edu.in

**How to cite this article:** Patel, B. R., Kumar, B., Patbandha, T. K., Vasava, A., & Prajapati, A. S. (2025). Diagnosis and Therapeutic Management of *Trypanosoma evansi* in an American Bully with Corneal Opacity. *Ind J Vet Sci and Biotech*, 21(6), 182-185.

**Source of support:** Nil

**Conflict of interest:** None

**Submitted** 02/07/2025 **Accepted** 01/08/2025 **Published** 10/11/2025

## CASE HISTORY AND OBSERVATIONS

A male American bully dog of eight month old, weighing 31 kg, was brought to Veterinary Clinical Complex, Veterinary College, Anand (Gujarat), India with a history of anorexia, dullness, weight loss and intermittent fever since one week (104 to 106.1°F). Pet was raised on a farmhouse with cattle and buffaloes, and given cooked carabeef as food. The dog was given two doses of antibiotics, but no improvement was observed. On close physical examination, it revealed mild depression with absence of menace response, unilateral corneal opacity, marked pale mucus membranes of conjunctiva and gingiva, edematous swelling on hind limbs, enlarged prescapular and popliteal lymph nodes. During a clinical consultation, the physiological parameters revealed increased rectal temperature (105.3°F), normal heart rate (114 beats/min) and respiration rate (18/min), with mild dehydration.

A thin blood smear examination from a peripheral blood (ear vein) stained with field stain (Coles, 1986) revealed slender haemoprotozoan parasites *Trypanosoma evansi* with

terminal kinetoplast and a long free flagellum outside the red blood cells (Fig. 1). The blood smear was negative for other blood protozoans, *Babesia* species and *Ehrlichia* species. The case was further confirmed for *Trypanosoma evansi* species by specific amplification 200 bp fragment of RoTat1.2 gene in in-house standardized RoTat1.2 PCR assay (Fig. 2). The 100 µL of DNA was purified from the 200 µL collected blood of dog with the help of commercial Blood DNA purification kit (GeneJET Whole Blood Genomic DNA Purification Mini Kit, Thermo Scientific, Lithuania) and reacted with *T. evansi* specific primers pair (Tf3: 5'GCACAAATGCCGACGGTA3' and Tb3: 5'GTCGTTGCCGTTATTGCT3') in a standard format (Kumar *et al.*, 2024). Thus, the case was diagnosed as Trypanosomosis with corneal opacity.

Haematological parameters on presentation (0 day) revealed decreased haemoglobin, haematocrit, TEC, TLC, neutrophils and platelet count with increased lymphocytes and eosinophils count, and serum biochemistry parameters revealed marked hypoglycaemia, hypoproteinemia and increase in activity of alanine aminotransferase (Table 1).

## TREATMENT AND DISCUSSION

The dog was treated with Inj. Berenil RTU (diminazine aceturate) @ 3.5 mg/kg BW deep IM along with IV Inj. DNS @ 10 mL/kg BW, Inj. Oxytetracycline @ 15 mg/kg BW once a day for 4 days, Inj. Melonex (Meloxicam 5 mg) @ 0.5 mg/kg BW IM once a day for 2 days, including Inj. Tribivet (Vitamin B<sub>1</sub>, B<sub>2</sub> and B<sub>6</sub>) and Inj. Ferritas (Iron Sorbitol + Folic acid + Vitamin B<sub>12</sub>) @ 2 mL IM once a day thrice on alternate days. Supportive therapy like hepatic protectant syrup Revell @ 10 mL twice a day and syrup Advplat @ 10 mL twice a day as platelet enhancer were also given.

The current clinical symptoms of American bully infected with *T. Evansi* were consistent with findings of previous studies (Agrawalet *et al.*, 2020; Kumar *et al.*, 2020; Rangasamy *et al.*, 2024). Recessive posture, subnormal temperature (98°F), and edematous enlargement of the rear legs were the typical signs of chronic trypanosomosis documented by Thirunavukkarasu *et al.* (2004), however in the present case the temperature was 104°F.

The decreased haemoglobin, haematocrit, TEC noticed in the present case were in agreement with the previous studies (Reddy *et al.*, 2016; Jeyabal, 2019; Kumar *et al.*, 2020; Rangasamy *et al.*, 2024). According to Gunaseelan *et al.* (2009), the primary haematological finding associated with *T. evansi* in dogs was anaemia, attributed to mechanical injury to erythrocytes by lashing action of the powerful locomotory flagella and microtubule reinforced bodies of the millions of organisms. The severity of anaemia typically reflects the duration and intensity of parasitaemia. In accordance with previous studies (Allam *et al.*, 2011; Reddy *et al.*, 2016), the current leucopaenia condition of dog was characterized by neutrophilia, eosinophilia, and lymphocytosis. The immunological suppression, which typically coexists with trypanosomosis, may have contributed to leucopenia.

Reactions of the immediate-type hypersensitivity are linked to eosinophilia. The cause of lymphocytosis is broad lymphoid tissue hyperplasia, which is typical of the acute stage of the illness. In this stage, the spleen and lymph nodes are extremely reactive, whereas in a chronic infection, the immune system loses lymphoid cells.

In the current case, there was decreased total serum protein, albumin and glucose level before treatment. There are similar reports of hypoproteinemia, hypoalbuminemia, anaemia, decreased PCV and thrombocytopenia in trypanosomosis (Orhue *et al.*, 2005). The decreased serum albumin level may indicate liver impairment, whereas increased serum globulin level is possibly as a result of increased antibody production. The hypoglycaemia observed may result from the parasites' excessive need of blood glucose for metabolism (Gunaseelan *et al.*, 2009; Rangasamy *et al.*, 2024). In the present case, elevated BUN values were consistent with the previous studies (Reddy *et al.*, 2016; Rangasamy *et al.*, 2024), which might be attributed to renal injury. Elevated serum ALT level was in accordance with previous report by Reddy *et al.* (2016). The high levels of ALT enzymes could be caused by tissue breakdown and inflammation in the host, specifically in the liver, heart, muscle and kidney. Re-examination of blood samples on day 7 and 15 post-treatment revealed significant improvement in haemato-biochemical parameters (Table 1).

**Table 1:** Haemato-biochemical profile before and after treatment of a dog infected with *T. evansi*

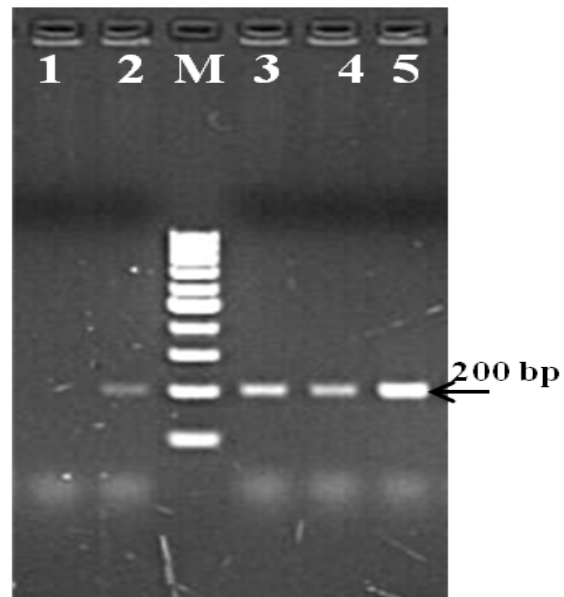
Parameters	0-day	7 <sup>th</sup> day	14 <sup>th</sup> day	Reference*
Hb (g/dL)	7.1	8.3	11.9	11.9-18.9
Haematocrit (%)	21	26	38	35-57
TECs (×10 <sup>6</sup> /µL)	3.6	4.3	5.4	4.95-7.87
TLCs (×10 <sup>3</sup> /µL)	4.1	5.0	8.3	5.0-14.1
Neutrophils (%)	35	49	58	58-85
Lymphocytes (%)	54	46	35	8-21
Monocytes (%)	05	04	06	2-10
Eosinophils (%)	06	01	01	0-9
Platelet (×10 <sup>3</sup> /µL)	42	115	231	211-621
Total protein (g/dL)	4.7	5.1	5.9	5.4-7.5
Albumin (g/dL)	2.3	2.7	3.4	2.3-3.1
Globulin (g/dL)	2.4	2.4	2.5	2.7-4.4
Glucose (mg/dL)	49	76	88	76-119
Urea nitrogen (mg/dL)	25	18	11	8-28
Creatinine (mg/dL)	0.8	0.9	0.8	0.5-1.7
ALT (U/L)	178	117	69	10-109

\*Behera *et al.* (2017)

After therapeutic management using single dosage of diminazene aceturate at 3.5 mg/kg body weight the dog showed significant improvement and started eating food and liquids. Diminazene aceturate is mostly chosen against *T. evansi* as a result of its greater therapeutic index



**Fig. 1:** Microscopic detection of *Trypanosoma* (arrow) in thin blood smear of dog stained with Giemsa (100 x)



**Fig.2:** Amplification of RoTat1.2 gene (200 bp) of *Trypanosoma evansi* from dog. M: 100 bp plus DNA ladder, Lane 1: negative control, Lane 2-4: sample, Lane 5: positive control.

and lower frequency of resistance. Similar outcomes were observed by Rani and Suresh (2007), Jeyabal (2019), and Agrawal *et al.* (2020). Even though there are several effective trypanosomacidal agents currently in use to treat canine trypanosomosis, including diminazene diaceturate, quinapyramine, and suramin, a single dose of diminazene (3.5 mg/kg) was successfully used in this study to eradicate the acute case of trypanosomosis in a male American bully. Rangasamy *et al.* (2024) however observed poor prognosis when single dose of diminazene acetate was given to dog infected with *T. evansi* in advanced stage of infection, that might be due to multi-organ failure.

Trypanosomiasis is frequently observed in crossbred cattle and buffaloes in India; the enhanced occurrence of canine trypanosomosis may be attributed to raw beef / carabeef feeding and the ingestion of trash tainted with animal offal. The current study noted a history of feeding cooked carabeef, so there is a good chance that any offal from the buffalo could be contaminated with garbage and consumed on the farm. In a comparable way, Nwoha *et al.* (2013) frequently saw *T. Evansi* in dogs that served as sentinel animals in the vicinity of slaughter-houses consuming fresh, raw meat from an infected animal.

## ACKNOWLEDGEMENTS

The authors are thankful to the Head, Veterinary Clinical Complex, Veterinary College, Anand, Gujarat for providing the necessary facilities to conduct the case study.

## REFERENCES

- Agrawal, H., Jaiswal, M., & Tripathi, A.K. (2020). Successful management of trypanosomiasis in a dog. *Indian Journal of Veterinary Medicine*, 40(2), 35-36.
- Allam, L., Ogwu, D., Agbede, R.I.S., & Sackey, A.K.B. (2011). Haematological and serum biochemical changes in gilts experimentally infected with *Trypanosoma brucei*. *Veterinarski Arhiv*, 81, 597-609.
- Aregawi, W.G., Agga, G.E., Abdi, R.D., & Büscher, P. (2019). Systematic review and meta-analysis on the global distribution, host range, and prevalence of *Trypanosoma evansi*. *Parasites & Vectors*, 12, 1-25.
- Behera, S.K., Sarma, K., Behera, P., & Ali, A.M. (2017). Therapeutic management of trypanosomosis with ophthalmic involvement in a dog. *Journal of Parasitic Diseases*, 41, 1162-1165.
- Coles, E.H. (1986). *Veterinary Clinical Pathology*. 4<sup>th</sup> edn., WB Saunders's Company, Philadelphia, USA, pp. 53-56.
- Eloy, L.J., & Lucheis, S.B. (2009). Canine trypanosomiasis: Etiology of infection and implications for public health. *Journal of Venomous Animals and Toxins including Tropical Diseases*, 15, 589-611.
- Green, C.E. (2006). *Infectious Diseases of Dogs and Cats*. 3<sup>rd</sup> edn., Elsevier, Missouri, USA, pp. 676-680.
- Gunaseelan, L., Kumar, K.S., Selvaraj, P., & Kathiravan, D. (2009). Haemato-biochemical changes in a case of canine trypanosomiasis. *Tamilnadu Journal of Veterinary and Animal Sciences*, 5(3), 122-123.
- Han, D., Yoon, W.K., & Hyun, C. (2014). Cerebellar encephalopathy from diminazene acetate (Berenil) toxicity in a dog. *Korean Journal of Veterinary Research*, 54(3), 193-196.
- Jeyabal, L. (2019). Per acute case of *Trypanosoma evansi* in a Dobermann - A case report. *Biological Forum*, 11(2), 170-173.
- Kumar, H., Sharma, V., Kumar, S., & Mishra, A. (2020). Diagnostic and therapeutic management of canine trypanosomiasis: A case report. *The Pharma Innovation Journal*, 9(3), 112-113.



- Kumar, B., Brahmabhatt, N.N., Thakre, B., Maharana, B.R., Parmar, V.L., & Kumar, M. (2024). Molecular identification of haemoparasites in animals using blood lysate PCR: A quick and inexpensive alternative to purified whole genomic DNA. *Animal Biotechnology*, 35(1), 2390935.
- Nwoha, R.I.O., Eze, I.O., & Anene, B.M. (2013). Serum biochemical and liver enzymes changes in dogs with single and conjunct experimental infections of *Trypanosoma brucei* and *Ancylostoma caninum*. *African Journal of Biotechnology*, 12(6), 618-624.
- Orhue, N.E.J., Nwanze, E.A.C., & Akafor, A. (2005). Serum total protein, albumin and globulin levels in *Trypanosoma brucei* infected rabbits: Effect of orally administered scopariadulcis. *African Journal of Biotechnology*, 4, 1152-1155.
- Rangasamy, V., Annamalai, L., Kanniappan, V.M., Mani, S., Natarajan, B.P., Chinnaswamy, P.P., & Alagarsamy, A. (2024). Occurrence of *Trypanosoma evansi* infection in Rottweiler dog from Cauvery delta region of Tamil Nadu, India: A case report. *Iranian Journal of Parasitology*, 19(3), 370-375.
- Rani, N.L., & Suresh, K. (2007). Canine trypanosomiasis. *Indian Veterinary Journal*, 84, 186-187.
- Reddy, B.S., Kumari, K.N., Sivajothi, S., & Rayulu, V.C. (2016). Haemato-biochemical and thyroxin status in *Trypanosoma evansi* infected dogs. *Journal of Parasitic Diseases*, 40, 491-495.
- Soulsby, E.J.L. (1982). *Helminths, Arthropods and Protozoa of Domesticated Animals*. 7<sup>th</sup> edn., Bailliere Tindall, London, pp. 533.
- Thirunavukkarasu, P.S., Rao, V.V., Srinivasan, S.R., Nambi, A.P., & Dhanapalan, P. (2004). Haemato-biochemical findings in case of trypanosomiasis in dog: A clinical study. *Indian Journal of Veterinary Medicine*, 24, 117.
- Urquhart, G.M., Armour, J., Duncan, J.L., Dunn, A.M., & Jennings, F.W. (2002). *Veterinary Parasitology*. 2<sup>nd</sup> edn., Blackwell Science Co., UK, pp.217.