

Detection of *Trypanosoma* in the cerebrospinal fluid of a dog exhibiting neurological manifestations

Sirigireddy Sivajothi, Bhavanam Sudhakara Reddy and Gollapalli Nagarjuna

Department of Veterinary Parasitology

Department of Veterinary Medicine

College of Veterinary Science, Proddatur-516360

Sri Venkateswara Veterinary University, Andhra Pradesh, India.

Abstract

A four-year-old Spitz was brought to the clinic with a history of dullness and chronic emaciation. Pale mucous membranes, corneal opacity, hypothermia, irregular heart rate, bounding pulse and poor response to external stimuli were observed. Laboratory tests revealed anaemia, decreased serum albumin, and glucose levels. *Trypanosoma evansi* organisms were detected in blood smears and cerebrospinal fluid. The cerebrospinal fluid analysis showed an increased cell count, and reduced glucose levels. The dog was treated with diminazene aceturate but unfortunately died on the fifth day of therapy.

Keywords: *Trypanosoma*, dog, cerebrospinal fluid, nervous signs

Trypanosomosis caused by the flagellate protozoan *Trypanosoma evansi*, is a disease transmitted to dogs through biting flies, vampire bats, oral ingestion of infected animal meat, and blood transfusions (Sivajothi *et al.*, 2015). Infected dogs can exhibit a wide range of clinical signs including anemia, lethargy, fever, difficulty swallowing, keratitis, uveitis, blepharoconjunctivitis, corneal opacity, and neurological manifestations such as ataxia, circling, head pressing, head tilt, hyperexcitability, nystagmus, and proprioceptive deficits (Defontis *et al.*, 2012). This paper records the detection of *Trypanosoma sp.* organism in the cerebrospinal fluid of the infected dog.

A four-year-old male Indian Spitz was brought to the clinic with history of dullness, progressive emaciation and corneal opacity for a period of ten days. Clinical examination revealed decreased rectal temperature, irregular heart rate, bounding pulse,

pale mucous membranes, corneal opacity, bilateral lacrimation, swelling of the hind limbs, ataxia and disorientation. Blood and cerebrospinal fluid were collected for analysis. Haematological findings showed anaemia (haemoglobin : 9.08 g/dL, total erythrocyte : $4.66 \times 10^6/\mu\text{L}$, packed cell volume : 29.2 %), higher total leucocyte count (18,350/ μL with neutrophils: 75%, eosinophils : 6%, : 16% and monocytes : 3%). Serum showed hypoalbuminemia (glucose :68.5 mg/dL, total protein: 6.02 mg/dL, albumin: 1.66 mg/dL, blood urea nitrogen: 89 mg/dL and creatinine: .43 mg/dL). Microscopic examination of a Giemsa-stained blood smear showed the presence of *Trypanosoma sp.*organisms between the red blood cells (Fig.1). Cerebrospinal fluid examination revealed viscous, light turbid coloured fluid with glucose of 49 mg/dL and total cell count of 38/cumm. Microscopic examination of the stained smear of cerebrospinal fluid showed the presence of *Trypanosoma sp.* trypomastigotes (Fig.2).

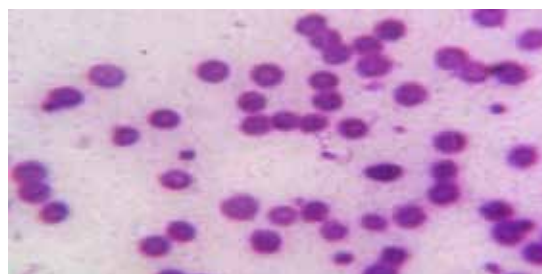


Fig.1: Microscopic examination of stained blood smears - Presence of *Trypanosoma evansi* organisms (1000X)

*Corresponding author : bhavanamvet@gmail.com

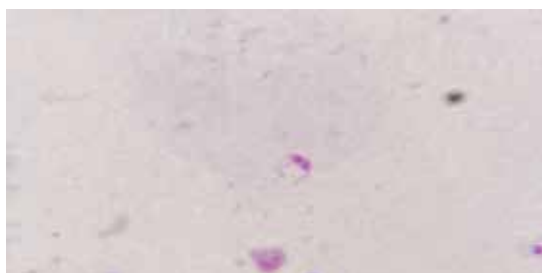


Fig.2: Microscopic examination of stained CSF smears - Presence of *Trypanosoma evansi* organisms (1000X)

The dog was treated with three doses of intramuscular diminazene aceturate (@ 3.5 mg/kg body weight, administered at 24-hour intervals), along with dextrose normal saline (@ 20 ml/kg body weight IV), amoxicillin and cloxacillin (@ 10 mg/kg body weight twice daily IV), and Imferon (@50 mg). Additionally, the dog received daily iron supplementation with Dexorange syrup (@ 10 grams per day). Despite the treatment, the dog died on the fifth day of presentation. The haematological and biochemical findings in this study, including anemia and hypoglycemia, are consistent with previous reports (Reddy *et al.*, 2016). Diminazene aceturate is commonly used to treat trypanosomiasis in animals. However, a single dose is not effective for horses, mules, or dogs, as the drug does not cross the blood-brain barrier and may be insufficient to control *T. evansi* infection. Recently, *T. evansi* strains resistant to diminazene aceturate have been isolated from buffalo (Sivajothi and Reddy, 2016). Underscoring the importance of using multiple doses of diminazene aceturate, in the present study, it was given three doses (Howe *et al.*, 2011). Despite advancements in treatment, eliminating *T. evansi* from the central nervous system remains a challenge, as most trypanocidal drugs cannot effectively cross the blood-brain barrier.

In the present study, Cerebrospinal fluid analysis revealed the presence of *Trypanosoma sp.* organisms with low glucose levels with high cell count in a dog with neurological signs.

Acknowledgement

The authors are thankful to the authorities of Sri Venkateswara Veterinary University, Tirupati for providing the facilities to carry out the work.

References

- Baldissera, M.D., Souza, C.F. and Boligon, A.A. 2017. Solving the challenge of the blood–brain barrier to treat infections caused by *Trypanosoma evansi*: evaluation of nerolidol-loaded nanospheres in mice. *Parasitology*.**144(11)**:1543-1550.
- Defontis, M., Richartz, J., Engelmann, N., Bauer, C., Schwierk, V.M., Büscher, P and Moritz A. 2012. Canine *Trypanosoma evansi* infection introduced into Germany. *Vet. Clin. Pathol.*, **41(3)**:369-74.
- Howe, S., Da Silva, A.S., Athayde, C.L., Costa, M.M. and Corrêa M.M.B. 2011. A New Therapeutic Protocol for Dogs Infected with *Trypanosoma evansi*. *Acta Scientiae Veterinariae*. **39(3)**: 988.
- Lampe, R., Foss, K.D., Vitale, S., Hague, D.W and Barger, A.M. 2020. Comparison of cerebellomedullary and lumbar cerebrospinal fluid analysis in dogs with neurological disease. *J. Vet Intern. Med.*, **34**:838–843.
- Reddy, B.S., Kumari, K.N., Sivajothi, S. and Rayulu, V.C. 2016. Haemato-biochemical and thyroxin status in *Trypanosoma evansi* infected dogs. *J. Parasit.Dis.*, **40**: 491-495.
- Sivajothi, S., Rayulu, V.C. and Reddy, B.S. 2015. Rapid serodiagnosis of *Trypanosoma evansi* in dogs by colloidal dye immunobinding assay. *Comp .Clin. Pathol.*, **24 (6)**: 1497-1500.
- Sivajothi, S. and Reddy, B.S. 2016. Polypeptide profiles of diminazene aceturate resistant *Trypanosoma evansi* organisms isolated from a buffalo. *J. Vet. Sci. Med.*, **4(1)**: 1.
- Sivajothi, S. and Reddy, B.S. 2018. *Trypanosoma evansi* infection in a cat -a rare case. *Comp .Clin. Pathol.*, **27**: 115-116.