CASE REPORT

FIRST REPORT OF BOVINE TRYPANOSOMIASIS IN THE KASHMIR VALLEY: THERAPEUTIC APPROACH

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Original Submission: 02 June 2025
Revised Submission: 17 June 2025
Accepted: 04 July 2025

How to cite this article: Bhat RA, Muhee A,Yatoo MI, Manzoor S, Shafi A. 2025. First report of bovine trypanosomiasis in the Kashmir valley: Therapeutic approach. Veterinaria, 74(2), 198-203.

ABSTRACT

Trypanosomiasis is a protozoan disease of major economic importance in livestock worldwide, but it has not been documented in the high-altitude, temperate climate of Kashmir, India. This article reports the first confirmed case of trypanosomiasis in non-descript cattle from the Kashmir Valley. A two-year old female non-descript cow in the first trimester of pregnancy was presented with a history of weakness, infestation of ticks, anorexia, haematochezia, unilateral epistaxis and pica to the Division of Veterinary Clinical complex, for the treatment. Clinical examination revealed hypothermia, white mucous membrane, enlarged prescapular lymph nodes, tachycardia, respiratory distress and hypersalivation. Haematological analysis revealed very low haemoglobin content and on blood smear examination, *Trypanosoma evansi* organisms were identified, which was further confirmed through presence of *Trypanosoma evansi* tryps in the lymph node aspirate. Blood transfusion was done with whole blood immediately, and then, Inj. diminazeneaceturate 7% RTU@ 5 mg/kg intramuscularly was given, which was repeated on 5th day. After 5 days, haemantinics were also given. The animal showed clear signs of recovery after blood transfusion. This constitutes the first case of surra in the Kashmir Valley, highlighting the parasite's expansion into the temperate region of the country and marking a critical observation for veterinary practitioners in the region. Future work is needed to identify the vector and possible reservoirs to prevent the spread of the disease.

Keywords: Trypanosomiasis, surra, *Trypanosoma evansi*

INTRODUCTION

Trypanosomiasis, also known as "surra," or "*mal de las caderas*" is a hemoprotozoan disease caused primarily by *Trypanosoma evansi* in cattle (Aregawi et al., 2019). It is transmitted through mechanical vectors, such as *Tabanus* and *Stomoxys* flies. In Africa, the vector of the disease is the *Glossina spp*., commonly known as the tsetse fly, while in America, Asia, and Europe, where tsetse flies are absent, transmission occurs through mechanical means by tabanids and stomoxys (Bello et al., 2024; Desquesnes et al., 2013). Additionally, in parts of Central and South America, it can be transmitted by the vampire bat *Desmodus rotundus*, which serves as a vector and a reservoir and does not involve a specific biological relationship between the parasite and its vector, enabling the parasite to spread beyond Africa (Desquesnes et al., 2013). The disease has severe economic consequences, resulting in huge losses to the livestock owners (Swallow, 2000). While the disease is endemic in many tropical and subtropical regions, its occurrence in the temperate Kashmir Valley is previously undocumented. This study represents the first documented incidence of bovine trypanosomiasis in Kashmir and highlights the clinical implications, diagnosis, and management strategies adopted.

CASE DESCRIPTION

A two-year old female non-descript cow in the first trimester of pregnancy was presented with a history of weakness, infestation of ticks, anorexia, haematochezia, unilateral epistaxis and pica to the Division of Veterinary Clinical complex, Faculty of Veterinary Sciences and Animal Husbandry (FVSc & AH) Shuhama for the treatment. Clinical examination revealed a body temperature of 98.7°F, white conjunctival mucus membranes, enlargement of prescapular lymph nodes, heart rate of 98 bpm and respiratory rate of 49 bpm and hypersalivation. No history of recent travel outside the region was reported, but the presence of biting flies in the locality was noted.

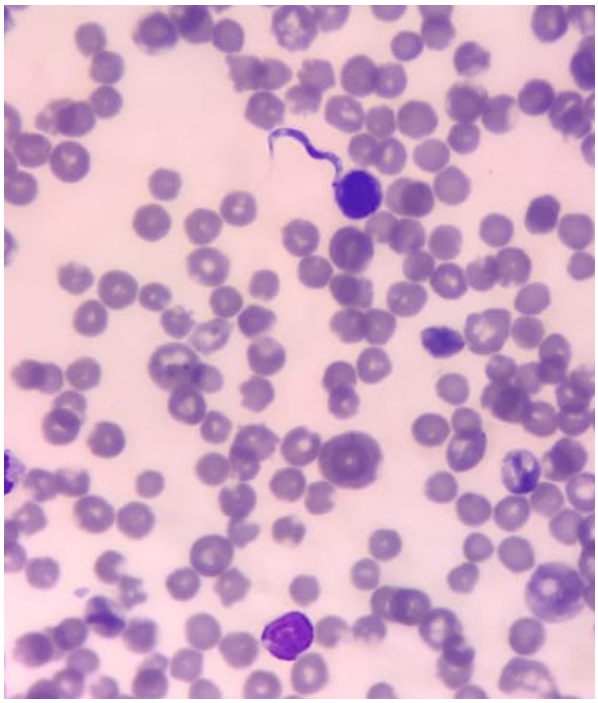

Figure 1 Trypanosoma within blood smear stained with Field stain

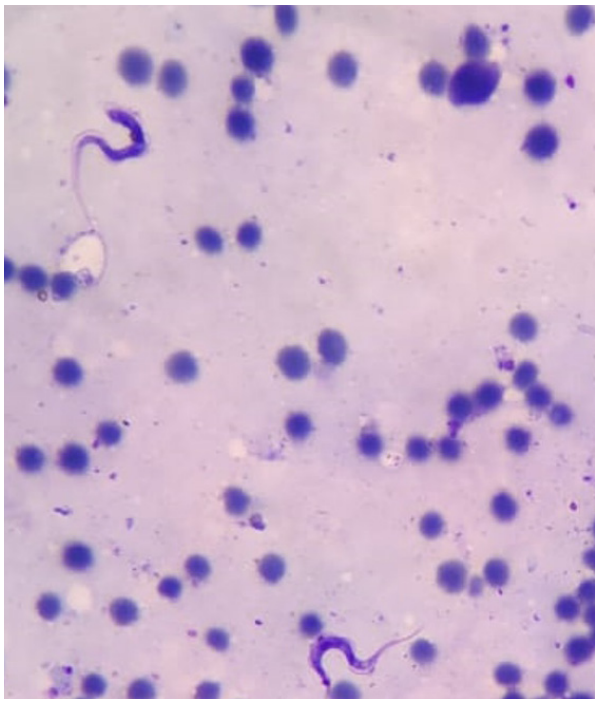

Figure 2 Trypanosoma within lymph node aspirate stained with Field stain

Diagnostic Evaluation

Blood samples collected in EDTA vials were examined after preparing thin and thick blood smears with Field stain (Amer et al., 2024). Lymph node aspirates were also collected in sterile EDTA vials and stained with Field stain. Microscopy revealed motile trypanosomes in field stained smears, and characteristic *Trypanosoma evansi* morphology (undulating membrane, kinetoplast, flagellum) is shown in Figure 1 and Figure 2.

The haematological and biochemical changes before and after treatment are shown in Table 1.

Table 1 Haematological and biochemical parameters at Day 0 and Day 9 of the treatment

Parameters	Unit	Value at Day 0	Value at Day 9
WBC	$\times 10^3/\mu l$	10.55	9.52
RBC	$\times 10^6/\mu l$	1.41	5.32
Hb	g/dl	3.3	7.8
HCT	%	7.9	23.11
MCV	Fl	56.02	46.22
MCH	Pg	23.40	14.66
MCHC	g/dl	41.77	33.75
Platelet	$\times 10^3/\mu l$	10	189
Glucose	mg/dl	43	68
ALT	IU/L	112	94
AST	IU/L	92	72
TP	g/dl	7.1	6.9
Albumin	g/dl	3.0	3.6
Globulin	g/dl	4.1	3.3

Treatment and Outcome

The case was treated with Inj. diminazeneaceturate 7% RTU@ 5 mg/kg intramuscularly at Day Zero and repeated after 5th day of the treatment. Blood transfusion was done with whole blood after proper cross matching through the CPDA containing bags. After 5 days, oral haemantinics were also given. The animal started to respond well to the treatment after the completion of blood transfusion with improved appetite and diminished clinical signs. The peripheral blood sample was found to be negative for the organism on the 5thday of the treatment. The prescapular lymph node swelling had subsided, hence lymph node aspirate was not collected. Complete recovery of the animal was observed on the 9th day, with much improvement in the haematological and biochemical parameters.

DISCUSSION AND CONCLUSION

Trypanosomosis (Surra) caused by the haemo-flagellate protozoan *Trypanosoma evansi*, is a significant constraint on the health and productivity of domestic animals throughout the tropics and subtropics (Singla et al., 2004; Da Silva et al., 2010; Tariq et al., 2024). In India, *T. evansi* is the most common and most prevalent trypanosome of livestock, although isolated cases of *Trypanosoma theileri* have also been encountered (Sood et al., 2011). The organism is transmitted mechanically by tabanid flies (Singh et al., 1993; Desquesnes et al., 2013), and the disease is more common in areas where the environment for the breeding of the fly vectors is most suitable (Bhatia et. al., 2006). The presence of *Trypanosoma evansi* in Kashmir Valley is a significant epidemiological

finding. The detection in non-descript cattle, which are typically hardy and resistant to many endemic diseases, suggests a possible expansion of vector habitats due to climate shifts or increased movement of animals and vectors. Early diagnosis and prompt treatment are crucial for recovery. This case underscores the need for regular surveillance, awareness among veterinarians and farmers, and vector control initiatives in emerging areas.

The present investigation deals with an acute trypanosomosis in a non-descriptive cattle. Significant results from various studies of *T. evansi* seroprevalence in India have been published by many authors (Juyal et al., 2005; Chandu et al., 2021). These studies demonstrated the importance of environmental factors in the epidemiology of Surra by highlighting the climatic risk factors linked to the disease's prevalence in cattle.

Among clinical signs, viz., fever, respiratory distress, pale mucous membrane, anorexia, swollen lymph nodes, unilateral epistaxis (which might be due to thrombocytopenia, formation of microthrombi, and hemorrhage suggestive of disseminated intravascular coagulation) have been also previously reported (Parragimenez and Reyna-Bello, 2019; Magez and Radwanska, 2014).

A significant decrease in the haematological variables was seen in the present case, especially in RBC count, PCV and haemoglobin. This alteration can be credited to the extravascular annihilation of the red blood cells, resulting in anaemia and a drop in PCV (Lelisa and Meharenet, 2021). Blood glucose was decreased in this case, which may be due to utilization of glucose by parasite (Bal et al., 2014; Fiorin et al., 2025).

The present study revealed a substantial increase in liver enzymes like ALT and AST in initial days of the infection following inflammatory cascade and tissue necrosis due to the infection. Additionally, the trypanosomal infestation leads to the increase in immunoglobulin concentration following antibody production to muddle through the antigens, resulting in hyperproteinaemia. Our findings were supported by the work of Pandya et al., (2018). Moreover, the albumin and globulin in initial infection were decreased and increased respectively, which is in agreement with the study of Bal et al. (2014) and Pandya et al., (2018).

Improvements have also been made to *T. evansi's* diagnostic capabilities. A multiplex PCR assay was developed by Charaya et al. (2021) to detect several hemoprotozoan illnesses, including *T. evansi,* simultaneously. This technique enhances the speed and specificity of diagnosis, essential for prompt intervention in affected cattle populations. The incidence of *T. evansi* in cattle has also been the subject of investigations by Kizza et al. (2021) and Ogolla et al. (2023), which employed molecular techniques to identify the parasite and evaluate related risk factors in various locations, including Kenya and Uganda.

This landmark case of bovine trypanosomiasis in the Kashmir Valley highlights the expanding geographical range of *Trypanosoma evansi* and reinforces the importance of clinical vigilance. Timely diagnosis and effective therapeutic intervention led to full recovery, demonstrating that with proper management, even emerging diseases can be effectively controlled.

CONFLICT OF INTEREST

The authors declared that there is no conflict of interest.

CONTRIBUTIONS

RAB: Data collection and processing, literature review, writing. AM: Conception, design, writing. MIY: Supervision, writing, critical review. SM: Conception, design, writing. AS: Supervision, writing, critical review.

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PRVI IZVJEŠTAJ O BOVINOJ TRIPANOSOMIJAZI U KAŠMIRSKOJ DOLINI: TERAPIJSKI PRISTUP

SAŽETAK

Tripanosomijaza je protozoarna bolest koja ima veliki ekonomski značaj u uzgoju stoke širom svijeta koja nije dokumentirana na višim nadmorskim visinama umjerene klime Kašmira u Indiji. Ovaj članak opisuje prvi potvrđeni slučaj tripanosomijaze kod stoke bez primjerene pasmine u Kašmirskoj dolini. Dvogodišnja krava bez pasmine u prvom trimestru graviditeta dovedena je na liječenje u Veterinarski klinički odjel. Anamnestički je bila prisutna slabost, infestacija krpeljima, anoreksija, hematohezija, unilateralna epistaksa i pika. Klinički pregled je pokazao hipotermiju, bjelilo mukoznih membrana, uvećane preskapularne limfne čvorove, tahikardiju, respiratorni distres i hipersalivaciju. Hematološka analiza je pokazala veoma nizak hemoglobin, dok je na krvnom razmazu identificirana *Trypanosoma evansi* koja je kasnije potvrđena prisustvom tripomastigotnih oblika u aspiratu limfnog čvora. Uključena je transfuzija cijelom krvi, a potom je intramuskularno aplicirana injekcija diminazeneaceturate 7% RTU@ 5 mg/kg, što je ponovljeno nakon pet dana. Petog dana su aplicirani i hemantinici. Životinja je pokazala jasne znakove oporavka nakon transfuzije krvi. Ovo je prvi slučaj sure u Kašmirskoj dolini koji dokazuje širenje parazita u područja umjerene klime u državi. Ovo opažanje je od presudnog značaja za područne veterinare. U budućnosti je neophodno identificirati vektore i moguće rezervoare kako bi spriječilo širenje bolesti.

Ključne riječi: Sura, tripanosomijaza, *Trypanosoma evansi*