SHORT COMMUNICATION

# Hospital Incidence and Clinico-Therapeutic Management of Trypanosomiasis in Horses

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## Abstract

Haemoprotozoal infection especially *Trypanosoma evansi* in horses has been found to be quite an ambiguity because they were regularly presented either as a carrier or with clinical signs of intermittent fever, peripheral edema, emaciation, urticaria with varying degree. In the present study, hospital incidence of trypanosomiasis was observed to be 17.78% (8/45) among horses presented with above signs. The disease was diagnosed by blood smear examination and PCR. The horses were successfully treated with diminazene aceturate along with supportive therapy and recovered within 5 days of treatment with normalization of altered haemato-biochemical profile.

**Key words:** Hemoprotozoal infection, *Trypanosoma evansi*, emaciation, PCR, Diminazene aceturate.

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## Introduction

Haemoflagellate protozoa of the genus *Trypanosoma* in equine have worldwide geographical distribution and there are total of five pathogenic equine trypanosomiasis of the genus *Trypanosoma* in blood and tissue fluids of the infected animals (Buscher *et al.,* 2019). The disease in horses is caused by *Trypanosoma evansi,* parasite of extravascular fluids and transmitted mechanically by haematophagus flies, depending upon the region (Tehseen *et al.,* 2017). They cause varying degree of clinical infection, severity and duration depends on the species and virulence of individual isolates. The horses are either presented clinically with the disease or they will come as a carrier without any sign and symptoms (Desquesnes *et al.,* 2013; Singh and Maharana, 2018). The present work reports hospital incidence and successful clinico-therapeutic management of Trypanosomiasis in 8 horses.

## Material and Methods

Total of 45 horses were presented to the medicine section of Veterinary Clinical Complex, Udgir, Latur (MAFSU, India) during last 2 years, *i.e.,* from January, 2024 to December, 2025 for different ailments. Out of which, 8 horses were presented with clinical signs of intermittent fever, inappetence to anorexia, emaciation, urticarial plaques, peripheral edema and incoordination. The complete history, determinants, physical examinations were performed on these reported cases of horses.

### Laboratory Evaluation

The affected horses were subjected to CBC, serum biochemistry, and thick and thin blood smear examinations were performed to identify the infection. The blood sample was also used to confirm the thin blood smear findings by employing molecular diagnosis of polymerase chain reaction. Qualitative and quantitative examination of the coprological samples was also carried out to rule out colic due to endoparasitic infection.

### Molecular Detection

After the confirmation of trypanosomiasis with blood smear examination, all the 8 samples were subjected to PCR. Standardized protocol to extract the DNA was adopted as per the manufacturer's instructions. The following PCR primers (Table 1) and the conditions (Table 2) were used for the detection of gene for *Trypanosoma evansi* of the product size 196 bp.

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**Conflict of interest:** None

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**Table 1:** Details of ISG primers used in the study

| Oligo name | Sequence 5'-3' | Length | Tm° C | GC% | Product size |
|---|---|---|---|---|---|
| ISG 196-F | AAAGCCACCGAAGATGCAGA | 20 | 60.0 | 50.0 | 196 bp |
| ISG 196-R | TTGTCCCAATCCAGCCACTC | 20 | 60.0 | 55.0 | |

**Table 2:** PCR Conditions

| Test | Component | Quantity | PCR Conditions | |
|---|---|---|---|---|
| ISG PCR | Dream Taq PCR Master Mix | 12.5 µL | Initial denaturation: 95°C for 5 min | |
| | Primer Forward (10 µM/µL) | 1.0 µL | Denaturation: 95°C for 30 sec | x 30 |
| | Primer Reverse (10µM/µl) | 1.0 µL | Annealing: 60°C for 30 sec | |
| | Template DNA | 1.0 µL (20 ng) | Extension: 72°C for 30 sec | |
| | Nuclease free water | upto 25 µL | Final extension: 72°C for 5min | |

### Therapeutic Schedule

All the 8 positive horses were primarily treated with Inj. diminazene aceturate @ 7 mg/kg b.wt., IM, along with supportive therapy of NSAID (Flunixine Meglumine), antibiotic (Amoxicillin-Cloxacillin) to combat secondary bacterial infection, fluid therapy (5% Dextrose, wherever necessary) and B-complex, IV, for 5 days or till recovery. The recovery in the horses was assessed on the basis of disappearance of clinical symptoms, absence of *Trypanosma* in the blood smear, restoration of normal CBC and serum biochemical values.

Statistical analysis of the experimental data on haemato-biochemical parameters before and after therapy was done by using paired 't' test as per the methods described by Snedecor and Cochran (1994).

## Results and Discussion

The hospital incidence of trypanosomiasis in VCC, Udgir was 17.78% with 8 horses being positive amongst 45 horses screened during the study period. Of the 8 cases, 4, 2 and 2 cases were seen in horses up to 3 years 3 to 6 years and more than 6 years of age, respectively. Among the total, 6 and 2 (75% and 25%) were male and female, respectively. Kathiawari (4), followed by Marwari (3) and non-descript (1) breeds were found to be affected in decreasing order. The number of horses affected in winter and summer season were 6 and 2 (75% and 25%), respectively. The above findings especially the incidence and host determinants were also recorded by Haldar *et al.* (2019) and Javanshir *et al.* (2023).

Physical examination of the ailing horses revealed fluctuating temperature (102.20±0.35 °F), while heart rate (48±0.75/min) and respiratory rate (24±0.66/min) were well within normal range. The clinical signs of pyrexia, anorexia, emaciation, urticarial patches on body and peripheral edema were found in all of the 8 horses in the present study. Similar signs were also recorded by Gopalkrishnan *et al.* (2019) and Raftery *et al.* (2020) in their study in equine Trypanosomiasis. The stool sample examination was found negative for any of the endoparasites.

The complete blood cell counts showed a highly significant ($p<0.01$) elevation of leucocytes along with monocytes, while the Hb, PCV, TEC, MCV and platelet counts revealed significant reduction ($p<0.05$) in tryponosomiasis positive horses. The serum biochemical values further showed significant elevation of the enzymes AST and creatine kinase in the infected horses under present study. These altered haemato-biochemical profile was significantly ($p<0.05$) reverted toward the normal values post-treatment (Table 3). Similar observations in relation to CBC and biochemicals were reported in tryps infected horses by Gopalkrishnan *et al.* (2019). The altered haemato-biochemical profile found to be normalized after treatment was in sync with Elshafie *et al.* (2018) (Table 3).

**Table 3:** Physiological, CBC and biochemical parameters of Trypanosoma affected horses

| Parameters | BT | AT |
|---|---|---|
| **Physiological Parameters** | | |
| Temperature (°F) | 102.20±0.35 | 100.78±0.46 |
| Heart rate (per min) | 48.00±0.75 | 42.00±0.48 |
| Respiratory rate (/min) | 24.00±0.66 | 22.00±0.86 |
| **CBC** | | |
| Hb (gm/dL) | 10.42±0.70 | 12.22±0.58* |
| PCV (gm %) | 30.80±0.46 | 35.46±0.56* |
| RBC ($10^{-12}$/L) | 5.65±0.28 | 7.24±0.48* |
| WBC ($10^{-9}$/L) | 16.52±0.88 | 12.28±0.47** |
| MCV (fL) | 36.42±0.41 | 40.26±0.88* |
| MCH (pg) | 16.4±0.56 | 14.58±0.26 NS |
| MCHC (gm/dL) | 39.10±0.74 | 35.48±0.84NS |
| Platelet ($10^{-9}$/L) | 106±0.83 | 148±0.94* |
| **Biochemical parameters** | | |
| AST (µ/L) | 290±0.82 | 254±0.56* |
| CK (µ/L) | 174±0.54 | 164±0.44* |

BT- Before treatment, AT - After treatment, NS- Non-significant, *Significant ($p<0.05$), **Highly significant ($p<0.01$)

The thin and thick blood smear examinations revealed severe infection of extracellular trypomastigote of *T. evansi*

(Fig. 1) while the PCR analysis also revealed all of the 8 horses being positive for the genomic analysis (Fig. 2). Laha and Sasmal (2008) recorded 12.74% of *T. evansi* cases in horses of Eastern Region of India by employing Giemsa-stained blood smear. Javanshir *et al.* (2023) reported 8 and 9 horses out of 80 positive with blood smear and PCR analysis. Sharma *et al.* (2022) recorded prevalence of 1.28% amongst the horse population by using indirect ELISA in different agroclimatic zones of Himachal Pradesh, India. Tehseen *et al.* (2017) also investigated *T. evansi* by using blood smear and PCR and found 18 and 54 horses positive with blood smear and PCR analysis, respectively. The coprological investigation of all the positive horses for *T. evansi*, revealed negative result, either qualitatively or quantitatively.

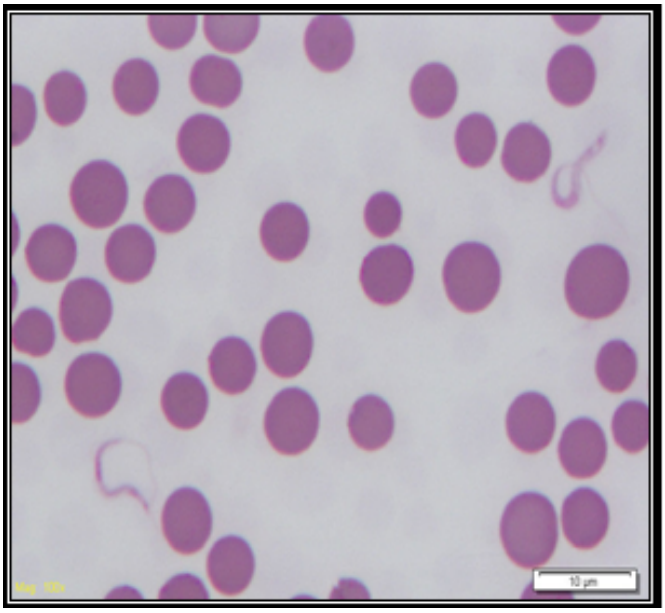


**Fig. 1:** Photomicrograph of *Trypanosoma evansi* in a peripheral blood smear of the infected horse.

All the positive cases of Trypanosomosis in horses were subjected to the specific drug of choice of diminazene aceturate along with supportive therapy till recovery. The ailing horses showed good recovery within 5 days of treatment with normal appetite, reduction in the peripheral edema. The similar observations regarding treatment were also recorded by earlier workers (Desquesnes *et al.,* 2013; Singh and Maharana, 2018; Gopalkrishnan *et al.,* 2019).

The present study revealed hospital incidence of equine Trypanosomiasis in VCC, Udgir as 17.78% (8/45) with blood smear examination and PCR analysis. The ailing horses exhibited signs like intermittent fever, urticarial plaques, peripheral edema, incoordination and emaciation, and were successfully treated with specific drug of diminazene aceturate along with supportive treatment and recovered

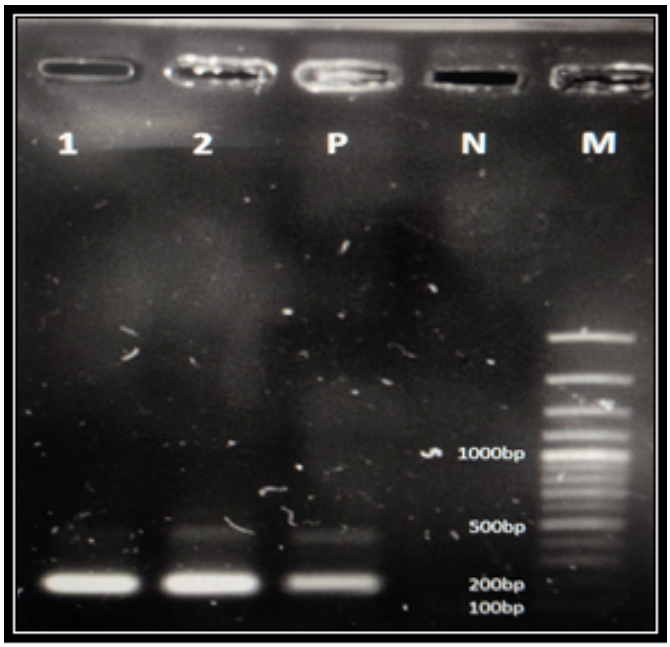



**Fig. 2:** The gel doc analysis revealed the positive DNA for *T. evansi* at 196 bp. PCR with ISG-196 primers, 1. CS2020124040, 2. CS2020124041, P-Positive DNA (product size 196 bp), N-Negative control, M-DNA Ladder.

within 5 days, with no any untoward reaction or side effects and reversal of altered haemato-biochemical profile.

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