

## An Outbreak of Equine Trypanosomiasis (Surra) with High Mortality in Horses in Chitwan, Nepal

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### Abstract

An outbreak of equine trypanosomiasis (Surra) occurred in a horse riding facility in Chitwan, Nepal. Eight of fifteen horses died within 1–1.5 months before laboratory diagnosis. Affected horses showed fever, anemia, emaciation and icterus. Blood smear examination confirmed *Trypanosoma* spp. Early diagnosis and herd-level trypanocidal therapy are essential to prevent severe losses.

**Keywords:** Surra; Horse; *Trypanosoma evansi*

### Introduction

Equine trypanosomiasis (Surra) caused by *Trypanosoma evansi* is an important hemoprotozoan disease affecting horses in tropical and subtropical regions. The disease is transmitted mechanically by biting flies and is associated with significant morbidity and mortality in equine populations. In endemic areas such as South Asia, delayed diagnosis and lack of specific therapy frequently result in heavy economic losses. The present report describes an outbreak of equine trypanosomiasis with high mortality in a horse riding facility in Chitwan district of Nepal.

### Case History and Observation

The outbreak occurred in a horse riding facility in Chitwan district, Nepal, where fifteen horses were maintained for tourism and recreational riding purposes. The animals had been purchased from

India and the Terai region of Nepal.

Within a period of approximately **1–1.5 months**, eight horses died following prolonged illness. Initial treatment was provided by local technicians and consisted mainly of symptomatic therapy without laboratory investigation. The clinical history and major signs observed in the affected horses are summarized in **Table I**.

Expert veterinary intervention was sought after eight horses had already died and the remaining animals began showing similar clinical signs.

Peripheral blood smear examination stained with Giemsa stain revealed slender extracellular flagellated hemoparasites consistent with *Trypanosoma* spp. (Figure 1).

Laboratory findings supporting the diagnosis are presented in Table III and Table IV.

The morphology and motility of the parasites were consistent with *Trypanosoma evansi*.

Hematological examination revealed mild anemia characterized by reduced hemoglobin and hematocrit levels, along with lymphopenia and thrombocytopenia, findings commonly associated with hemolytic conditions such as trypanosomiasis.

Serum biochemical analysis revealed severe hyperbilirubinemia and markedly elevated SGOT levels indicating hemolysis and hepatic involvement, which are commonly associated with *Trypanosoma evansi* infection.

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## Treatment and Discussion

After confirmation of the disease, herd-level treatment was recommended.

Affected and in-contact horses were treated with diminazene aceturate at a dose rate of 3.5–7 mg/kg body weight administered intramuscularly. Supportive therapy including fluid therapy, hepatoprotective agents, hematinics and nutritional supplementation was also provided.

Vector control measures such as fly repellents and sanitation around the stable were implemented to reduce biting fly populations.

Following treatment, the surviving horses gradually improved clinically. The pregnant mare responded to therapy and recovered without abortion.

The clinical signs observed in the present outbreak including fever, anemia, progressive weight loss and icterus are consistent with previous reports of equine trypanosomiasis (Desquesnes *et al.*, 2013). Elevated bilirubin and SGOT levels observed in the affected mare indicate hemolysis and hepatic involvement commonly associated with *Trypanosoma evansi* infection.

Delayed diagnosis and absence of specific trypanocidal therapy during the early phase of the outbreak likely contributed to the high mortality observed in this herd. Environmental conditions in the Chitwan region including humid climate and abundance of biting flies may have facilitated mechanical transmission of the parasite.

## Summary

An outbreak of equine trypanosomiasis with high mortality occurred in a horse riding facility in Chitwan district, Nepal. Eight out of fifteen horses died before laboratory diagnosis was established. Peripheral blood smear examination confirmed the presence of *Trypanosoma* spp. Early diagnosis, trypanocidal therapy and vector control are essential to prevent severe economic losses in endemic regions.

## References

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**Table I. Clinical history and major signs observed in affected horses**

| Parameter           | Observation                                    |
|---------------------|------------------------------------------------|
| Herd size           | 15 horses                                      |
| Number of Deaths    | 8                                              |
| Duration of illness | 1-15 months                                    |
| Source of animals   | Purchased from India and Terai region of Nepal |
| Persistent fever    | Present                                        |
| Body condition      | Progressive emaciation                         |
| Feed intake         | Reduced / anorexia                             |
| Mucous membranes    | Pale                                           |
| Urine color         | Yellowish                                      |
| General condition   | Weakness and lethargy                          |

**Table II. Clinical examination findings of the affected mare (Munny)**

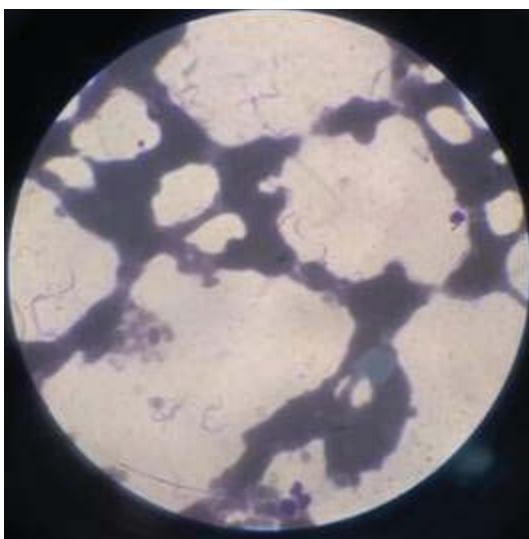
| Parameter          | Finding              |
|--------------------|----------------------|
| Animal             | Mare                 |
| Name               | Munny                |
| Age                | Adult                |
| Pregnancy status   | 2.5 months pregnant  |
| body weight        | Approximately 300 kg |
| Body condition     | Markedly emaciated   |
| Rectal temperature | 104.6°F              |
| Pulse rate         | 80 beats/min         |
| Respiration rate   | 16 breaths/min       |
| General condition  | Weak and lethargic   |

**Table III. Hematological findings of the affected mare**

| Parameter               | Result                  | Reference Range | Interpretation     |
|-------------------------|-------------------------|-----------------|--------------------|
| WBC                     | $5.63 \times 10^9/L$    | 6.0 – 17.0      | Slightly low       |
| Lymphocytes (%)         | 4.5 %                   | 12 – 30         | Decreased          |
| MID (%)                 | 4.1 %                   | 2 – 4           | Slightly increased |
| Granulocytes (%)        | 91.4 %                  | 62 – 87         | Increased          |
| Lymphocytes (absolute)  | $0.25 \times 10^9/L$    | 1.0 – 4.8       | Low                |
| MID (absolute)          | $0.23 \times 10^9/L$    | 0.2 – 1.5       | Normal             |
| Granulocytes (absolute) | $5.14 \times 10^9/L$    | 3.0 – 12.0      | Normal             |
| Hemoglobin (HGB)        | 11.1 g/dL               | 12 – 18         | Mild anemia        |
| MCH                     | 20.4 pg                 | 19.5 – 24.5     | Normal             |
| MCHC                    | 49.4 g/dL               | 31 – 34         | Increased          |
| RBC                     | $5.46 \times 10^{12}/L$ | 5.5 – 8.5       | Slightly low       |
| MCV                     | 41.4 fl                 | 60 – 77         | Low                |
| Hematocrit (HCT)        | 22.57 %                 | 37 – 55         | Markedly low       |
| Platelets (PLT)         | $121 \times 10^9/L$     | 200 – 500       | Low                |
| MPV                     | 9.2 fl                  | 3.9 – 11.1      | Normal             |

**Table IV. Serum biochemical parameters of the affected mare**

| Parameter            | Result       | Reference Range | Interpretation                   |
|----------------------|--------------|-----------------|----------------------------------|
| Random Blood Sugar   | 92 mg/dL     | 60–140          | Normal                           |
| Urea                 | 10 mg/dL     | 10–50           | Low-normal                       |
| Creatinine           | 0.43 mg/dL   | 0.6–1.1         | Slightly low                     |
| Sodium               | 133.6 mmol/L | 135–145         | Mild hyponatremia                |
| Potassium            | 3.37 mmol/L  | 3.5–5.5         | Mild hypokalemia                 |
| Total Bilirubin      | 4.68 mg/dL   | 0.2–1.2         | Markedly increased               |
| Direct Bilirubin     | 0.10 mg/dL   | 0.0–0.4         | Predominantly indirect bilirubin |
| SGOT (AST)           | 772 U/L      | 0–46            | Severely elevated                |
| SGPT (ALT)           | 47 U/L       | 0–49            | Mild elevation                   |
| Alkaline Phosphatase | 157 U/L      | 35–129          | Mild elevation                   |

**Figure 1. Giemsa-stained peripheral blood smear showing extracellular flagellated *Trypanosoma* spp.****Figure 2. Clinical appearance of affected horse showing severe emaciation and poor body condition.**

| BIO-CHEMISTRY REPORT |        |                                              |
|----------------------|--------|----------------------------------------------|
| test                 | Result | Reference Range                              |
| Sugar (R)            | 92.0   | 60 - 140 mg/dl                               |
| Renal Function Test  |        |                                              |
| Urea                 | 10.0   | 10 - 50 mg/dl                                |
| S.Creatinine         | 0.43   | Men: 0.6 - 1.1 mg/dl, Women: 0.5 - 0.9 mg/dl |
| Sodium               | 133.6  | 135 - 145 mmol/L                             |
| Potassium            | 3.37   | 3.5 - 5.5 mmol/L                             |
| Liver Function Test  |        |                                              |
| Bilirubin (Total)    | 4.68   | Adult 0.2 - 1.20 mg/dl, Infant 0.2-8.0 mg/dl |
| Bilirubin (Direct)   | 0.10   | 0.0 - 0.4 mg/dl                              |
| SGOT                 | 772.0  | 0-46 U/L                                     |
| SGPT                 | 47.0   | 0-49 U/L                                     |
| Alkaline Phosphatase | 157.0  | 35-129 U/L, Children 54-369 U/L              |

**Figure 3. Hematological and biochemical laboratory report of the affected mare confirming hemolysis and hepatic dysfunction.**