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A CASE STUDY

# Trypanosomosis in a captive wild dog (*Cuon alpinus*)

BOON ALLWIN[1], R. THIRUMURUGAN[2], M. PALANIVEL RAJAN[1] AND N.R. SENTHIL

**Members of the Research Forum**

**Associate Author :**
[1]Department of Wildlife Sciences, Madras Veterinary College, CHENNAI (T.N.) INDIA

[2]Arignar Anna Zoological Park, Vandalur, CHENNAI (T.N.) INDIA

**AUTHOR FOR CORRESPONDENCE :**
**N.R. SENTHIL**
Centralised Clinical Laboratory, Madras Veterinary College, CHENNAI (T.N.) INDIA
Email: drnrsenthil@gmail.com

**Abstract :** Trypanosoma is an extra erythrocytic hemoprotozoan parasite, transmitted by biting flies and infected meat, causing fever, corneal opacity, anaemia. A male captive wild dog of Arignar Anna Zoological Park, Vandalur aged 3 years had a complaint of anorexia, lethargy, edema of forehead, staggering gait and reduced activity levels in its enclosure. Wet film revealed the presence of numerous motile *Trypanosoma* sp. Haematological parameters showed anaemia and mild neutrophila. Serum biochemistry was found to be altered. The treatment done was administration of Triquin to the ailing animal. The wild dog was housed in the in-patient ward for continuous monitoring. No Trypanosomes could be detected in the wet film and stained smears taken subsequently. After a week, the wild dog was shifted to its enclosure and is doing well.

**Key words :** Wild dog, Trypanosomiasis, Haematology, Biochemistry, Treatment

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## INTRODUCTION

Trypanosomiasis is a hemoprotozoan disease of domestic and wild animals. Trypanosoma is an extra erythrocytic hemoprotozoan parasite, transmitted by biting flies and infected meat, causing fever, corneal opacity, anaemia, and myocarditis. Wild dog or Dhole is an endangered canid protected under Wildlife Protection Act, 1972 and a difficult species to maintain in captivity. All species of *Trypanosoma*, with the exception of some strains of *T. vivax* which produce a hyper acute and acute infection, characterized by high parasitaemia, fever, severe anemia and hemorrhages on the mucosal and serosal surfaces (Urquhart *et al.*, 2002). Trypomastigote form of trypanosome enters host cells soon after infection, multiplies sub clinically and escapes the immune system and spread throughout the body primarily within macrophages. Parasitaemia develops within a few day and peaks 2 to 3 weeks post infection, coinciding with clinical disease (Barr *et al*., 1991). Anemia is a cardinal feature of the disease in which red blood cells are removed from the circulation by the expelled mononuclear phagocytic system. Later, in infection of several months duration, when the parasitaemia become low and intermittent, anemia may resolve to a variable degree (Urquhart *et al.*, 2002). There are a number of effective trypanosomacidal agents for dogs including suramin, quinapyramine and diminazene but single dose of diminazene aceturate is effective in eliminating the natural trypanosomiasis infection in canine (Rani and Suresh, 2007).

## RESEARCH METHODOLOGY

A male captive wild dog aged 3 years weighing 15 kg, of Arignar Anna Zoological Park, Vandalur was presented with a complaint of anorexia, lethargy, edema of forehead, staggering gait and reduced activity in enclosure. The wild dog was chemically immobilized with xylazine @ 1mg/kg and ketamine @ 10 mg/kg and taken to the zoo veterinary hospital for detailed examination and treatment. Physical examination revealed high rise of temperature (40.8$^{o}$C), pale mucous membrane, bilateral lacrimation, and generalized debility. On thoracic auscultation, exaggerated breath sounds on both sides were observed. The wet film, peripheral blood smear, whole blood and serum were collected. Hematology examination was done in Auto-haemoanalyser (BC-Vet, 2800) and serum biochemistry in A15 auto analyser (Biosystems).

## RESULTS AND DISCUSSION

Microscopic examination revealed the presence of *Trypanosoma* organism outside the RBC's (extracellular). Wet film revealed numerous motile organisms that were suggestive of *Tryps* sp., the blood smear stained with Leishman-Giemsa stain revealed as many as 14-17 trypanosomes per field which is indicative of severe infection (Fig. 1). Haematological parameters and Serum biochemistry was found to be altered (Table 1, 2 and 3). No abnormality was detected on thoracic radiography.

The ailing animal was treated with Triquin (@ 0.025mg /kg BW) S/C single dose, plasma volume expanders,

**Table 1 : Haemotological examination**

| Component | Recorded value | Normal range |
|---|---|---|
| Hb (g/dl) | 9.2 | (16.69 ± 0.26) |
| RBC×$10^6$ | 4.92 | (7.49 ± 0.05) |
| PCV (%) | 26.7% | (46.88 ± 1.31) |
| WBC×$10^3$ | 7.2 | (7.91 ± 4.79) |
| MCV | 54.43 | 62.50 |
| MCH | 29.0 | 28.0 |
| Anaemia – microcytic normochromic | | |

**Table 2 : Differential count**

| Cell | Recorded value | Normal range |
|---|---|---|
| Neutrophils | 74 | (72.63 ± 2.81) |
| Lymphocytes | 20 | (25.25 ± 2.76) |
| Monocytes | 02 | (00.75 ± 0.31) |
| Eosinophils | 04 | (01.38 ± 0.41) |
| Basophils | | NIL |

**Table 3 : Serum biochemistry**

| Parameters | Recorded value | Normal range |
|---|---|---|
| BUN | 20.40 | (20.56 ± 0.74) |
| Creatinine | 2.87 | (1.44 ± 0.04) |
| Total protein (g/dl) | 7.03 | (6.09 ± 0.30) |
| Albumin (g/dl) | 3.01 | (2.38 ± 0.22) |
| Globulin (g/dl) | 4.02 | (3.71 ± 0.33) |
| Calcium (mg/dl) | 2.70 | (9.10 ± 0.64) |
| Phosphorus(mg/dl) | 6.07 | (5.86 ± 0.48) |
| Glucose | 33.99 | (53.63 ± 1.28) |
| ALT | 102 | (19.76 ± 0.79) |

vitamins, I/V fluids and amino acids. The wild dog was housed in the in-patient ward for continuous monitoring. No Trypanosome could be detected in the wet film and smears taken subsequently. After a week, the wild dog was shifted to its enclosure and is doing well.

There is no published literature available regarding the prevalence of trypanosomiasis in wild dog in India. Clinical signs observed in these wild dogs were in agreement with the findings reported by Rani and Suresh (2007), who reported *T. evansi* organism in peripheral blood with a history of inappetance, dullness and persistent fever since five days but the same authors also observed bilateral corneal opacity which is a characteristic finding in chronic trypanosomiasis also reported by Thirunavukkarasu *et al.* (2004). The fever characterized by high temperature might be due to the effects of toxic metabolites produced by dying trypanosomes (Tizard *et al.*, 1978).

The anaemic changes encountered are attributable to extravascular destruction of RBC's which may be through the process of erthro phagocytosis or metabolic product or from liberation of toxins by the parasites, hemodilution and depression of erythropoiesis. There was a marked decrease in RBC, Hb, and PCV and total WBC count remained unaltered as similar to findings observed by Hellebrekers and Slappendel (1982) and Sandoval *et al.* (1994).

There were some alterations in the serum biochemistry that was in agreement with Lushaikyaa *et al.* (2011). Amongst this creatinine, were found to be elevated and blood glucose was found to be decreased. The metabolic toxins liberated by the organisms may be the reason for low blood glucose level and glycogen reserve due to hepatic changes. Additionally, trypanosomes utilize a large amount of glucose to sustain their viability. An increase in ALT indicating hepatic degeneration, coinciding with the findings in *T.evansi* infection in dogs. There was a decrease in the albumin: globulin ratio. The fall in albumin levels was secondary to hyperglobulinemia as a compensatory mechanism for maintenance of normal blood viscosity increased by globulin levels.

In conclusion, clinical signs and symptoms along with the microscopic examination of *Trypanosoma* organism

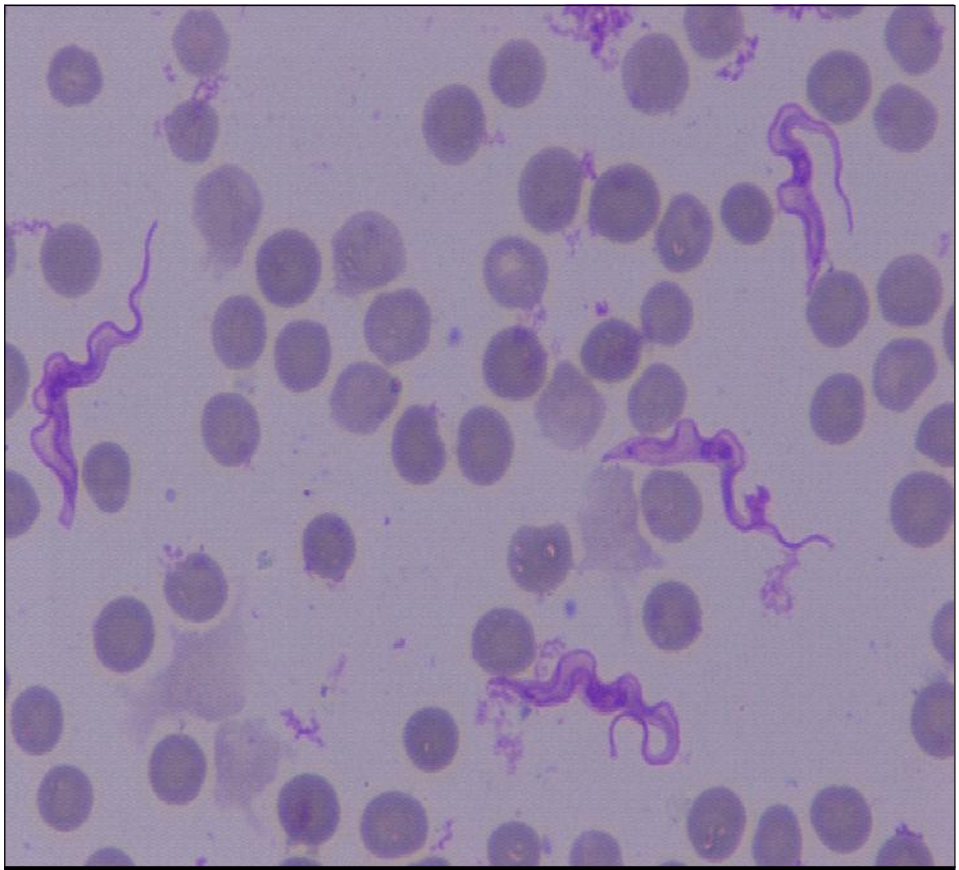

**Fig. 1 : L-G stained blood smear showing tryps**

through peripheral blood smear suggested the case of trypanosomiasis. Moreover, it was also concluded that single dose of Triquin @ 0.025 mg/kg body weight successfully treated the wild dog with trypanosomiasis.

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