International Journal of Science, Environment and Technology, Vol. 13, No 6, 2024, 387 – 391
ISSN 2278-3687 (O)
2277-663X (P)

HAEMATOBIOCHEMICAL ALTERATIONS IN TRYPANOSOMOSIS IN TWO DOGS

P. Amaravathi[1], T. Prebavathy and V. Vaikunta Rao
Department of Veterinary Clinical Complex, College of Veterinary Science, SVVU, Tirupati – 517502
[1]Department of Veterinary Pathology, College of Veterinary Science
Tirupati - 517502
E-mail: amarapvet@gmail.com

Abstract: Two dogs were presented to Veterinary clinical complex, college of Veterinary Science, Tirupati with a history of high fever 104^0F, anorexia in the last two days. Haematological examination revealed decrease in hemoglobin, PCV and total erythrocyte count and increase in total leukocytes and mild neutrophilia. Blood smears of both dogs stained with Leishman's stain revealed long slender form of trypanosomes with terminal kinetoplasts and long free flagellum diagnosed as *Trypanosoma evansi* Biochemical analysis revealed decrease in glucose, albumin and calcium levels in both the dogs, increase in ALT in case 1 and increase in BUN and creatinine in case 2.
Keywords: Albumin, Dogs, edema, flagellum, hemoglobin.

Introduction

Trypanosomosis (Surra) is an important haemoprotozoan disease caused by various members of Trypanosoma species affecting different species of domestic and wild animals like horses, mule, donkey, camel, cattle, buffaloes, sheep, goat, dogs, pigs and various wild animals with chief clinical signs of high intermittent fever, anaemia, loss of weight, oedema of dependent parts, nervous symptoms, abortion and is responsible for major production losses (Barr *et al*., 1991). The disease is transmitted by various biting flies like Tsetse, Tabanus, Stomaxys, Culicoides etc. (Green, 2006). It is widely distributed in tropical and subtropical regions. It is insect borne and their epidemiology is determined by the ecology of insect vector. Surra in dogs is characterized by high mortality and morbidity and anemia which has been recorded as a consistent finding in infected dogs. (Prabhakar *et al*., 1971). Severity of canine trypanosomosis ranges from acute, subacute to chronic. Clinical signs in chronic Trypanosomosis are characterized by weight loss, progressive weakness, anorexia, anaemia, intermittent fever, conjunctivitis, swelling of limbs, enlarged superficial lymph nodes and corneal opacity (Thirunavukkarasu *et al.*, 2004). The present study was carried out to evaluate the hematological and biochemical alterations in a dog infected with *Trypanosoma evansi.*

*Received Nov 9, 2024 * Published December 2, 2024 * www.ijset.net*

Materials and methods:

Two dogs were presented to Veterinary clinical complex, college of Veterinary Science, Tirupati with a history of high fever 104^0F, anorexia in the last two days. Blood collected in 10% EDTA solution from two dogs was used for the estimation of Total Leukocyte count (TLC), Packed cell volume (PCV) by Microhematocrit method (Jain, 1986) and Hemoglobin (Hb) by Sahli's method (Coles, 1986). Blood smears were prepared and stained with Leishman's stain for examination of haemoprotozoans under microscope. Blood was collected directly into the sterile test tube and allowed to clot. The serum was collected and stored at 4^0C until use and was used for the estimation of biochemical parameters.

Results and Discussion:

Two dogs were examined thoroughly edema of dependent portions were observed (Fig. 1).

Fig.1. Dog showing edema of dependent portions

Results of whole blood and serum examination were displayed in Table.

Parameter	Case 1	Case 2
Haemoglobin (g%)	4.2	5.6
Packed Cell Volume (%)	16	20
Total Erythrocyte count (10^6/ µl)	2.73	3.45
Total Leukocyte Count (10^3/ µl)	29.8	27.3
DLC: Neutrophils (%)	77	78
Lymphocytes (%)	33	21
Eosinophils (%)	00	01
Glucose (mg/dl)	89.66	69.80
Total Protein (g/dl)	6.6	6.68

Albumin (g/dl)	1.2	1.7
Blood urea Nitrogen (mg/dl)	28.3	122.43
Creatinine (mg/dl)	1.20	4.15
AST (U/L)	37	42.3
ALT (U/L)	847.20	23.7
ALP (U/L)	265	412
GGT (U/L)	6	5
Cholesterol (mg/dl)	201.37	164.24
Triglycerides (mg/dl)	65	93
Direct bilirubin (mg/dl)	0.05	0.12
Total bilirubin (mg/dl)	0.01	0.014
Calcium (mg/dl)	6.8	8.9
Phosphorous (mg/dl)	10.5	5.6
Sodium (mEq/L)	103	110
Potassium (mEq/L)	5.1	6.4
Hs CRP (mg/dl)	0.42	0.28

Blood smears of both dogs stained with Leishman's stain revealed long slender form of trypanosomes with terminal kinetoplasts and long free flagellum diagnosed as *Trypanosoma evansi* (Fig. 2 and 3).

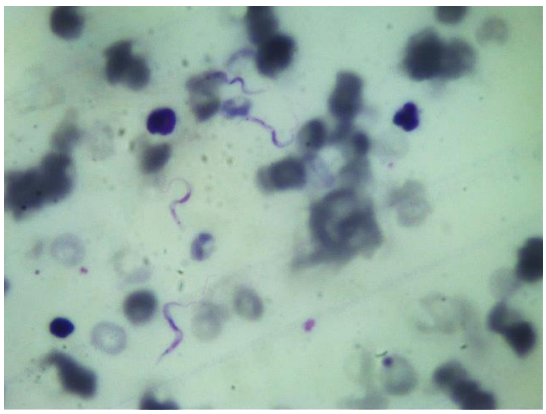

Fig.2. Long slender form of trypanosomes. x 1000

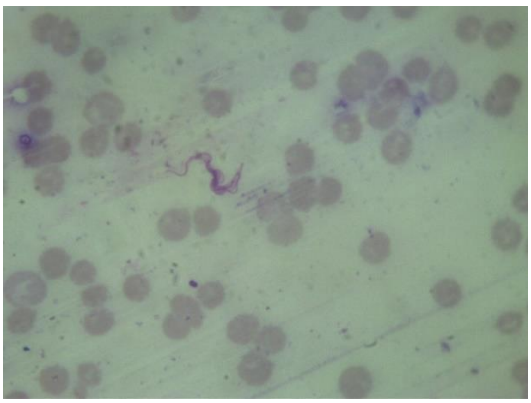

Fig.3. Note long free flagellum. x 1000

Haematological examination revealed decrease in haemoglobin, PCV and total erythrocyte count and increase in total leukocytes and mild neutrophilia. Biochemical analysis revealed decrease in glucose, albumin and calcium levels in both the dogs, increase in ALT in

case 1 and increase in BUN and creatinine in case 2. Kjos *et al*. (2008) who studied clinical hematology of canine chagas disease in Texas had reported hypoproteinemia, hypoalbuminemia, anemia (decrease packed cell volume) and thrombocytopenia. Similar reports were made by Rashid *et al*., 2008. The drop in albumin levels on its own is a compensatory mechanism for maintaining blood viscosity, which is increased by hyperglobulinemia (Aquino *et al*., 2002). The anemic changes were attributable to extravascular destruction of RBC which may be through the process of erythro phagocytosis or metabolic product and toxins liberated from the parasites. The metabolic products and toxin liberated may be the reason for low blood glucose and glycogen reserve due to hepatic changes. In addition, it was established that trypanosomes utilize a large amount of glucose (Gunaseelan *et al*., 2009). In conclusion, severe anaemia, hypoglycaemia and hypoalbunemia are characteristic features in trypanosomosis in dogs.

References

[1] Aquino L P C T, Machado R Z, Alessi A C, Santana A E, Castro M B, Marques L C, Malheeiros E B 2002 Hematological, biochemical and anatomopathological aspects of experimental infection with *Trypanosoma evansi* in dogs. Arquivo Brasileiro de Medicina Veterinaria e Zootecnia 54(1):8 - 18

[2] Barr S C, Gossett K A and Klei T R 1991 Clinical, clinicopathologic and parasitological observations of trypanosomiasis in dogs infected with North American *Trypanosoma cruzi* isolates. American Journal of Veterinary Research 52: 954 - 60.

[3] Coles E H 1986 Veterinary clinical pathology. WB Saunders Company, Philadelphia, USA pp. 445-446.

[4] Green C E 2006. Infectious diseases of dogs and cats. 3rd. edn. Elsevier Inc. 676- 80

[5] Gunaseelan L, Senthil Kumar K, Selvaraj P and Kathiresan D 2009 Haemato Biochemical Changes In A Case Of Canine Trypanosomiasis. Tamilnadu Journal of Veterinary and Animal Sciences 5 (3): 122-123

[6] Jain N C 1986 Schalms Veterinary Hematology – Lea and Febiger Philadelphia II edition.

[7] Kjos S A, Snowden K F, Craig T W, Lewis B, Ronald N and Olson J K 2008 Distribution and characterization of canine chagas disease in Texas. Veterinary Parasitology 152: 249-256.

[8] Prabhakar, R. Jhatkar and Mohan Singh Purohit 1971 Pathogenesis of Anemia in *Trypanosoma evansi* infection. Indian Veterinary Journal 48: 239-244.

[9] Rashid A, Rasheed K and Hussain A 2008 Trypanosomiasis in Dog; A Case Report. Iranian Journal of Arthropod-Borne Diseases 2(2): 48-51

[10] Thirunavukkarasu P S, Rao V V, Srinivasan S R, Nambi A P and Dhanapalan, P 2004 Haematobiochemical findings in case of trypanosomiasis in dog: a clinical study. Indian Journal of Veterinary Medicine 24: 117.