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A Case Of Canine Trypanosomosis With Epistaxis In A Two-Year Old Alsatian Dog

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Abstract: *A 2-year old male Alsatian dog with a history of Inappetence and sudden weakness was presented with a clinical manifestation of fever (40^{0}C), lethargy, rough hair coat, pale mucous membrane (anemia), and epistaxis. On blood smear evaluation numerous trypanosome parasites were observed. Furthermore, hematological evaluation revealed moderate regenerative anemia, moderate leucopenia with neutropenia with left shift and lymphocytosis while serum biochemical evaluation revealed mild hypoproteinaemia and hypofibrinogenemia. The patient was treated with diminazene diaceturate intramuscularly at a single dose rate of 3.5 mg/kg body weight followed by an oral dose of doxycycline at a dose rate of 20 mg/kg in two divided doses twice a day for 10 consecutive days. Topical/intranasal instillation of 2 mg of Adrenaline and intramuscular injection of vitamin K3 at a dose rate of 10 mg/kg once a day, were administered for three consecutive days.*

Keywords: *Trypanosomosis, Trypanosoma, Alsatian, Canine, Epistaxis.*

I. Introduction

Animal trypanosomosis constitutes a serious impediment to livestock production and economic development in tsetse infested regions of Sub-Saharan Africa (Matete, 2003; Nimpaye et al., 2011; Abakpa et al., 2013). Jones (2000) described canine trypanosomosis as a disease caused by Trypanosoma cruzi and Trypanosoma evansi. Today different species of trypanosomes have been implicated in causing trypanosomsis in dogs. Hence, canine Trypanosomosis is a disease caused by hemoprotozoan parasites: Trypanosoma brucei brucei and Trypanosoma congolense. The disease can also be caused by T. cruzi the cause of American Trypanosomosis known as Chagas disease in humans (Jimenez-Coelle et al., 2010; Tola and Muniz, 2010; Cohen and Gurtler, 2001; Doyle, 2006). Dogs are also infected by Trypanosoma b. rhodesiense and Trypanosoma b. gambiense of man (Samdi et al., 2006). It serves as reservoirs and maintenance of infection in humans vice versa. Trypanosoma rangeli is a non-pathogenic trypanosome of humans which also infect dogs (CVBD, 2010). Recently, Trypanosoma caninum of unknown pathogenicity has been isolated from an intact skin of a dog along with leishmania in south eastern Brazil (Madeira et al., 2009; Barros et al., 2012). Its mode of transmission is not yet known as efforts to infect triatomids failed (CVBD, 2010).

Trypanosomosis in dogs was first described in 1908 (Bevan, 1913). Infection with T. congolense is said to be more common in dogs (Museux, Boulouha et al. 2011). In Nigeria, trypanosomosis in dogs is a common occurrence in the T. brucei gambiense belt, where the ocular, lymphadenopathy and meningeal forms as the three distinct forms of disease have been reported (Omamegbe et al., 1984).

The disease is transmitted through bites from infected tse-tse fly. However, dogs can also get the infection by ingestion of insect vectors or infected fresh animal carcasses that died recently from trypanosomosis and through oral experimental infection (Raina, Kumar et al. 1985, Uilenberg 1998, Montenegro, Jiménez et al. 2002). Transmission mainly occurs around the watering sites and is sustained in animal- tsetse-animal cycle by Glossina pallidipes. Trypomastigote form of trypanosoma enters host cells soon after infection, multiplies sub clinically, escape the immune system and spread throughout the body primarily within macrophages. Parasitaemia develops within few days 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).

Parasitological diagnosis could be made by microscopic examination of either the lymph node aspirates of blood, or cerebrospinal fluid (CSF) of infected dogs (François et al., 2005). Polymerase chain reaction (PCR) technique could be used as a diagnostic tool in cases of canine trypanosomosis as it can be applied on any patient sample that contains trypanosomes DNA (OIE, 2008). There are a number of effective trypanosomacidal agents for dogs including suramin, quinapyramine and diminazene but single dose of diminazene diaceturate is

effective in eliminating the natural trypanosome infection in canine (Rani and Suresh, 2007). The present report describes a case of trypanosomosis in a dog presented with epistaxis.

II. Case Report

2.1 Signalment and history: On the 7th October, 2013, a 2-year old male Alsatian dog weighing 34 kg was presented to the small animal veterinary clinic, Veterinary Teaching Hospital, University of Ibadan with principal complaints of inappetance and sudden weakness noticed a day prior to presentation. Further history revealed that the dog had been earlier treated by a veterinarian for same condition with azithromycin (1 g), charcoal and a local herb identified as African basil (Ocimum gratissimum). According to the client, there was a slight improvement following this intervention but the dog later developed seizures.

2.2 Physical Examination: The rectal temperature, heart and respiratory rates values were 40°C, 146 beats/minute and 115cycles/minute respectively. Abnormal findings observed on the first day of presentation were lethargy, rough hair coat and pale mucous membranes. The dog was also recumbent on presentation. Blood wet mount revealed numerous Trypanosoma parasites. The dog war re-presented the next day with another complaint of epistaxis which started few hours before presentation (Figure 1). Blood clotting time was estimated to be 10 and 25 minutes on days 1 and 2 respectively following the onset of epistaxis.

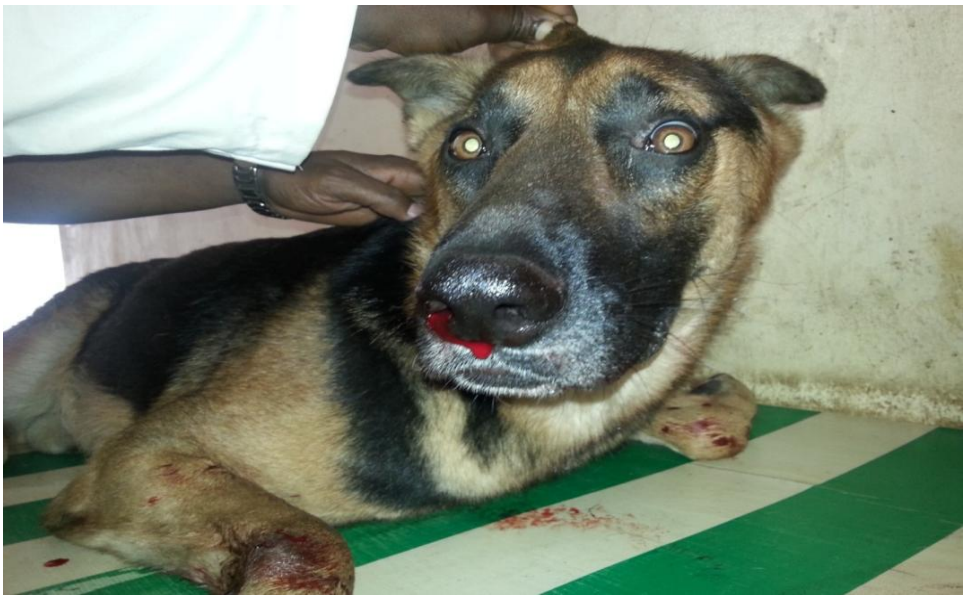

Figure 1: Dog with Trypanosomosis showing signs of epistaxis.

2.3 Problem List: Pyrexia, anorexia, pale mucous membrane (anemia), and epistaxis were the most worrisome clinical findings.

2.4 Diagnostic Plan: Heparinized blood and serum samples were sent to clinical pathology laboratory for complete blood count, identification of any haemoparasite and clinical serum chemistry.

2.5 Differential Diagnosis: Canine Trypanosomosis, Canine Erhlichiosis and Anticoagulant poisoning were our differential diagnosis. Canine Trypanosomosis and Canine Erhlichiosis were considered due to the presence of anemia and trypanosomal parasites in the blood; and epistaxis and tick infestation respectively. We also considered anticoagulant poisoning due to the presence of epistaxis observed in the affected dog.

2.6 Tentative Diagnosis: We further narrowed our diagnosis to Trypanosomosis and Erhlichiosis as mentioned earlier. Anticoagulant poisoning was ruled out based on our history of anorexia which started two weeks before presentation as reported by the owner. Hence we believe there was unlikelihood of it ingesting a poisonous substance.

2.7 Confirmatory Diagnosis: This was based on the microscopic or parasitological examination of blood samples collected from the dog presented. Canine Erhlichiosis was however ruled out since these parasites were not found during parasitological examination of blood sample.

2.8 Laboratory Results: The result indicated a moderate anemia, moderate thrombocytopenia, and moderate leucopenia with moderate neutropaenia (Table 1). There was mild hypoproteinaemia and mild hypofibrinogenemia (Table 2). Numerous Trypanosome parasites were observed (Table 3).

2.9 Treatment: Diminazene diaceturate was administered by intramuscular route at a single dose rate of 3.5 mg/kg (119 mg total) (Rjeibi et al., 2015). Oral administration Doxycycline commenced on the second day of presentation at a dose level of 20 mg/kg (700 mg) in two divided doses twice a day for 10 consecutive days. Topical/intranasal application of 2 mg (2 ampoules) of Adrenaline and intramuscular injection of vitamin K3 at a dose rate of 10 mg/kg (340 mg) once a day, were administered for three consecutive days.

Table 1: Hematology result

TEST	RESULT	REFERENCE VALUES
RBC ($x10^6$µL)	4.13	4.95 - 7.87
Hb (g/dL)	8.2	11.9 - 18.9
PCV (%)	25	35 - 57
WBC ($x10^3$/µL)	4.20	5.0 - 14.1
NEUT (%)	43	58 - 85
LYM (%)	46	8 - 21
MON (%)	4	2 - 10
EOS (%)	1	0 – 9
BAS (%)	0	0 – 1
PLT ($x10^3$/µL)	186	211 – 621

Table 2: Serum biochemistry result

TEST	RESULT	REFERENCE VALUES
Plasma protein (g/dL)	5.3	6.0 - 7.5
Albumin (g/dL)	2.4	2.3 - 3.1
ALT (µL)	110	10 - 109
AST (µL)	10	13 - 15
ALP (µL)	97	1 - 114
Creatinine (mg/dL)	1.6	0.5 - 1.7
BUN (mg/dL)	22	8 – 28
Fibrinogen (mg/dL)	100	150 – 300

Table 3: Blood parasite test result

TEST	RESULT (Parasite in)
Wet mount	+ve Tc 7.8 Hpf
Buffy coat	+ve Tc 8.3 Hpf
Blood Smear	+ve Tc 6Hpf

III. Discussion

There is limited published literature available regarding the prevalence of trypanosomosis in dog in Nigeria. In the present case, microscopic examination revealed the presence of Trypanosoma parasites outside the erythrocytes. The observed clinical signs and symptoms such as pyrexia (40^oC), pale mucous membranes and bilateral corneal opacity are in agreement with earlier reports (Rjeibi et al., 2015; Thirunavukkarasu et al., 2004; Rani and Suresh, 2007). Anemia which is regarded as the most consistent finding in trypanosomosis of man and domesticated animal has been reported in T. congolense infected dogs (Gow et al., 2007). In this study, there was regenerative anemia (8.8g/dL) which is in agreement with Rjeibi et al., (2015). The leucopenia was characterized by neutropenia, thrombocytopenia and lymphocytosis. The significant decrease in the WBC observed in this study agrees with the findings of Sadique et al., (2001) in cattle infected with T. congolense. Leucopenia in animal trypanosomosis has been reported to be due largely to ineffective or depressed granulopoiesis in the bone marrow (Anosa et al., 1997a). Thrombocytopenia has been reported in dogs confirmed with Chagas diseases (Kjos et al., 2008; Rjeibi et al., 2015). In the case under consideration, epistaxis with thrombocytopenia was observed on the second day of presentation. This has been reported earlier after it was confirmed to be due to T. congolense with PCR in Nigeria (Abakpa et al., 2013).

The decrease in total plasma protein level (hypoproteinemia) observed in this study is consistent with the findings of Kjos et al., (2008) who reported decrease in total plasma protein in dogs with canine Chagas disease and Sadique et al., (2001) in cattle infected with T. congolense but disagree with Rajora et al., (1968) and Rjeibi et al., (2015) in dogs infected with T. evansi.

The decrease in fibrinogen level observed in this study disagrees with the findings of (Greenwood and Whittle, 1975). Both reported elevated fibrinogen levels in T.b. rhodesiense and T.b. gambiense infection of man. French (1938) reported normal fibrinogen levels in T. brucei and T. congolense -infected cattle.

The increased activity of ALT in this study agrees with the reports of other workers (Kwem et al., 2000; Akpa et al., 2008) and may be due to the effects of trypanosomes in tissues including the liver (Justine and Oluwatosin, 2005) but the decrease in AST is in disagreement to the above report.

Diminazene diaceturate single dose was given as a trypanocide while doxycycline was administered to take care of the unconfirmed Erhlichia parasites. Tentative treatment for Erhlichiosis was administered since there was no laboratory facility to rule out Erhlichia infection. Tetracyclines are highly effective in treating Erhlichiosis and when prescribed should be administered for at least 7 days (Walker and Dumler, 2000; Walker et al., 2001). Doxycycline is used in preference to other tetracyclines in most cases of Erlichiosis because of its superior pharmacokinetic properties and lesser frequency of adverse gastrointestinal reactions (Forti and Benincori, 1969; Bakken and Dumler, 2000). Adrenaline is an effective haemostatic agent which acts by its vaso-constrictive effect and was given to stop the nose bleeding. Its duration of action is short but with a faster onset of action. This was applied to stop the bleeding instantly. Vitamin K is a hemostatic agent whose mode of action is to help in hepatic synthesis of coagulation factors. Vitamin K3 was therefore administered for three days to effectively stop the bleeding. A single treatment with Diminazene diaceturate cleared the parasite on the third day, thus agreeing with other reports (Rani and Suresh, 2007; Abakpa et al., 2013).

References

[1]. Abakpa, S. A. V., Takeet, M. I., Makinde, A. F., Adeleye, A. I., and Adebayo, O. O. (2013). Molecular diagnosis of Natural infection of Trypanosoma congolense in a dog in Abeokuta, Nigeria: A case report. IOSR Journal of Agriculture and Veterinary Science, 5(5): 3-6.

[2]. Akpa, P. O., Ezeokonkwo, R. C., Eze, C. A., and Anene, B. M. (2008). Comparative efficacy assessment of pentamidine isethionate and diminazene aceturate in the chemotherapy of Trypanosoma brucei brucei infection in dogs. Vet. Parasitol. 151: 139-149.

[3]. Anosa, V. O., Logan-Henfrey, L. L. and Wells, C. W. (1997a). The haematology of T. congolense infection in cattle 11: Macrophages structure and function in adult Boran cattle. Comparative Haematology International. 7: 23-29.

[4]. Bakken, J. S., and Dumler, J. S. (2000). Ehrlichiosis. In: Cunha BA, ed. Tickborne Infectious Diseases. Diagnosis and Management. New York: Marcel Dekker. Pp. 139-68.

[5]. 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. Am. J. Vet. Res. 52: 954-960.

[6]. Barros, J. H. S., Almeida, A. B. P. F., Figueiredo, F. B., Sousa, V. R. F., Fagundes, A., Pinto, A. G. S., Baptista, C., and Madeira, M. F. (2012). Occurrence of Trypanosome caninum in areas overlapping with leishmaniasis in Brazil: what is the real impact of canine leishmaniasis control. Trans. R. Soc. Trop. Med. Hyg. 106(7): 419-423.

[7]. Bevan, E.W. (1913). Preliminary notes on a trypanosome causing disease in man and animal in the Sebungwe district of southern Rhodesia. Journal of Tropical Medicine and Hygiene, 16:113–117.

[8]. CVBD (2010). Canine Vector Born Diseases. Trypanosomosis. 4th Internal Symposium.

[9]. Doyle, R. L. (2006). Eficacia de tres medicamentos no controle da infeccao experimental por trypanosome evansi em ratos (Rattus norvegicus) linhagem wistar. (Master's thesis). Santa Maria; Centro de Ciencias Rurais da Universidade Federal desanta maria. P 40.

[10]. Francçois, C., Louis, L., Pere, S., Veerle, L., and Philippe, B. (2005). Options for Feild Diagnosis of Human African Trypanosomosis. Ame. Soc. Micro. 18(1):133-146

[11]. Forti, G., and Benincori, C. (1969). Doxycycline and the teeth. Lancet,1:782

[12]. French, M. H. (1938): Acute and subacute trypanosomiasis in cattle caused by Trypanosoma, virax. J. Comp. Pathol. 54: 108 - 119.

[13]. Greenwood, B. M., and Whittle, H. C. (1975). Production of free light chains in Gambian trypanosomiasis. Clin. Exper. Immunol. 20: 437-442.

[14]. Gow, A. H., Simpson, J. W., and Picozzi, K. (2007). First report of canine African trypanosomosis in the UK. J. Small Anim. Pract. 48(11):658-661.

[15]. Jiménez-Coello, M., Guzmán-Marín, E., Ortega-Pacheco, A., and Acosta-Viana, K. Y. (2010). Serological Survey of American Trypanosomiasis in Dogs and Their Owners from an Urban Area of Mérida Yucatàn, México. Trans.Emerg. Dis. 57 (1-2): 33-36.

[16]. Jones, T. C., Hunt, R. D., King, N. W. (2000). Molestias causadas por protozoarios. In: Jones, T. C., Hunt, D., and King, N. W., editors. Patologia Veterinaria. 6thed. Sao Paulo: manole: 559-610.

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

[18]. Madeira, M. F., Sousa, M. A., Barros, J. H., Figueiredo, F. B., Fagundes, A., Schubach, A., DE Paula, C. C., Faissal, B. N., Fonseca, T. S., Thomas, H. K., and Marzochi, M. (2009). Trypanosoma caninum n. sp.(Protozoa: Kinetoplastida) isolated from intact skin of a domestic dog (Canis familiaris) captured in Rio de Janeiro, Braz. Parasitol., 136: 411-423.

[19]. Matete, G. O. (2003). Occurrence, clinical manifestation and the epidemiological implications of naturally occurring canine trypanosomosis in western Kenya. Onderstepoort Journal of Veterinary Research, 70: 317–323

[20]. Montenegro, V. M., Jiménez, M., Dias, J. C., and Zeledón, R. (2002). Chagas disease in dogs from endemic areas of Costa Rica. Mem Inst Oswaldo Cruz, 97: 491-494

[21]. Museux K, Boulouha L, Majani S, Joirnaux H (2011). African trypanosoma infection in a dog in France. Veterinary Record-English Edition, 168: 590. DOI: 10.1136/vr.d888

[22]. Nimpaye, H., Njiokou, F., Njine, T., Njitchouang, G. R., Cuny, G., Herder, S., Asonganyi, T., and Simo, G. (2011). Trypanosoma vivax, T. congolense "forest type" and T. simiae: prevalence in domestic animals of sleeping sickness foci of Cameroon. Parasite (Paris, France), 18: 171-179.

[23]. OIE. (2008). Trypanosomosis. OIE Terrestial Manual. Chapter 4: 18.

[24]. Omamegbe, J.O., Orajaka, L.J.E., and Omehelu, C.O. (1984). The incidence and clinical forms of naturally occurring canine trypanosomiasis in two veterinary clinics in an Anambra State of Nigeria. Bulletin of Animal Health and Production in Africa, 32: 23–29.

[25]. Raina, A. K., Kumar, R., Rajora, V. S., and Sridhar, S. R. P. (1985). Oral transmission of Trypanosoma evansi infection in dogs and mice. Vet. Parasitol. 18(1): 67-69.

[26]. Rajora, V. S., Raina, A. K., Sharma, P.D., and Singh, B. (1968). Serum protein changes in buffalo calve experimentally infected with Trypanosoma evansi. Indian Journal of Veterinary Medicine. 6:65- 73.
[27]. Rani, N. L. and Suresh. K. 2007. Canine trypanosomiasis. Ind. Vet. J. 84: 186-187.
[28]. Rjeibi, M. R., Ben Hamida, T., Dalgatova, Z., Mahjoub, T., Rejeb, A., Dridi, W., Gharbi, M. (2015). First report of surra (Trypanosoma evansi infection) in a Tunisian dog. EDP Sciences Parasite-journal. 22: 3.
[29]. Sadique, N. A., Adejinmi, J.O., and Ariri, H. (2001). Haematological and plasma protein values of Zebu cattle in trypanosome-endemic zone. Tropical Animal Production Investment 4: 219-223.
[30]. Samdi, S. M., Abenga, J. N., and Kalgo, A. M. (2006). Trypanosomosis in hunting dogs in Kaduna, North Central Nigeria: implications on the disease in humans. J. biomed. Invest. 4(1): 15-18.
[31]. Tola, R. W., and Muniz, A. (2010). Trypanosomiasis. eMedicine Specialties > Pediatrics: General Medicine > Parasitology. Complete this reference
[32]. Uilenberg, G. (1998). A field guide for the diagnosis, treatment and prevention of African animal trypanosomes FAO Corporate Document Repository.
[33]. Urquhart. G. M., Armour. J., Duncan, J. L., Dunn., A. M., and Jennings, F. W. (2002).Veterinary Parasitology. 2nd Ed. Blackwell Science Co. UK. Pp. 217.
[34]. Walker, D. H., and Dumler, J. S. (2000). Ehrlichia chaffeensis human monocytotropic ehrlichiosis, Ehrlichia phagocytophila human granulocytotropic ehrlichiosis., and other Ehrlichiae. In: Mandell, G. L., Bennett, J. E., and Dolin, R., eds. Principles and Practice of Infectious Diseases. Fifth ed. Philadelphia, PA: Churchill Livingstone, 2057-64.
[35]. Walker, D H., Raoult, D., Dumler, J. S., and Marrie, T. (2001). Rickettsial Diseases. In: Braunwald, E., Fauci, A. S., Kasper, D. L., Hauser, S. L., Longo, D. L., Jameson, J. L., eds. Principles of Internal Medicine. Fifteenth ed. New York, NY: McGraw-Hill, 1070-1072.
[36]. Thirunavukkarasu, P. S., Rao, V. V., Srinivasan, S. R., Nambi, A. P., and Dhanapalan, P. (2004). Ind J Vet Med. 24: 117.