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THERAPEUTIC MANAGEMENT OF MIXED HAEMOPARASITIC INFECTION AND CORNEAL OPACITIY IN A 4-YEAR-OLD MALE GERMAN SHERPHERD DOG

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Abstract

Tick borne haemoparasitc diseases are the most common vector borne diseases in canines. These infections are spread from one host to another by tick bite and ingestion.

Mixed haemoparasitic infection like canine babesiosis and ehrlichiosis can result in severe clinical disease. A 4-year-old male German Shepherd dog was presented to Pet Health Veterinary Clinic, Arepo Ogun State with the complain of staggering into objects and heavy tick infestation. On physical examination, the dog was febrile, had bilateral corneal opacity, the ocular mucus membranes were pale, there was heavy tick infestation. Blood sample was collected for haematology, blood smear, liver and kidney function tests. Peripheral blood smear examination revealed the presence of Babesia *parasites in the erythrocytes, severe anaemia, neutrophilia, anisocytosis, and macrocytosis. Rapid test kit for Ehrlichiosis was positive. Kidney function test shows high blood urea nitrogen (BUN) while liver function test shows high total protein The dog was administered Simparica® (2mg/kg) to control tick infestation, haematinics to aid blood formation, dexamethasone (0.5mg/kg) to reduce inflammation due to corneal opacity, diminazene aceturate(3.5mg/kg) to treat Babesiosis and doxycycline(10mg/kg) to treat Ehrlichiosis. The dog recovered completely after 7days and was fully discharged.*

Keywords*: Babesiosis, Ehrlichiosis, Tick infestation, Doxycycline, Cornea opacity, Anaemia*

INTRODUCTION

Dogs are associated with different haemoparasites which can pose serious health concern with significant economic impact to owners (Manandhar & Rajawar, 2008). These blood parasites have always been a major challenge in dogs because of their adverse effect on haematological parameters and rate of spread from one animal to the other (Phuyal et al., 2015). Dogs are exposed to ectoparasites such as ticks, fleas, biting flies and mites that transmit haemoparasites and other pathogens of domestic animals and humans (Adamu et al., 2017). Haemoparasites of pets play a significant role in human disease transmission (Moriello, 2003). Haemoparasites of dogs such as Babesia canis, and Ehrlichia canis can cause illness such as canine vector-borne disease (CVBD) in the tropical countries (Bhattacharjee & Sarmah, 2013). These blood parasites are mostly diagnosed and identified through blood smear examination under light microscope, however molecular tools have contributed to the diagnosis of more parasites in dog population in Nigeria (Amuta et al., 2010).

The purpose of this case report is to investigate a clinical case of mixed infection of Babesiosis and Ehrlichiosis in German Shepherd Dog which resulted in corneal opacity, with clinical and laboratory examinations performed, and to advise on preventive measures.

CASE HISTORY

A male 4-year-old German Shepherd dog with a body weight of 33 kg was presented at Pet Health Veterinary Clinic. Arepo, Ogun State. The animal has a history of epistaxis few months prior to presentation. The dog was presented by the owner with the primary complain that the dog had been staggering on objects and heavy tick infestation on the body.

CLINICAL EXAMINATION

Physical examination bilateral corneal opacity and parlour of the mucous membrane. The appetite was satisfactory and there was no serious sign of dehydration. The temperature was 39.1-degree Celsius, pulse 100 beats per minute and Heart rate 92 beats per min. The mucus membrane was pale with

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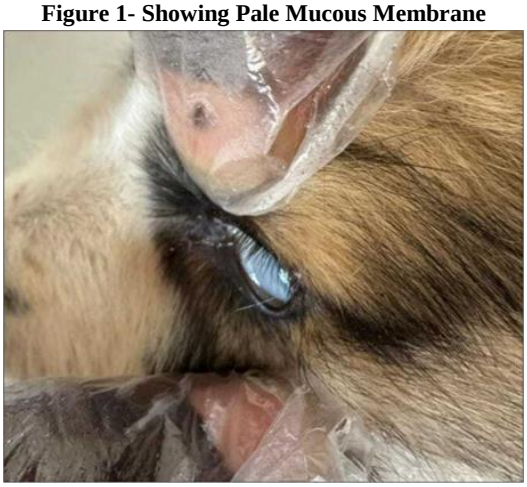
bilateral corneal opacity. There was heavy ticks' infestation on the body.

Figure 1- Showing Pale Mucous Membrane



MANAGEMENT PLAN

Approximately, 5 ml blood was collected from the dog by using 21-gauge needle attached to 5 ml syringe through cephalic venipuncture. A fraction of whole blood was transferred into EDTA tubes for estimation of haematological and electrolyte parameters including liver and kidney function test

A part of whole blood collected in-EDTA tubes from the dog was used for preparation of thin blood smear by using commercially available Wright Giemsa stain for detection of Babesia. Then the stained slide was examined carefully under oil immersion objective (100X) to any haemoparasite. Blood smear examination was performed on the day of blood collection. Rapid test kit was used to detect *Ehrlichia. spp*

LABORATORY RESULT

BLOOD FILM REPORT

Red blood cells: The blood picture reveals macrocytic hypochromic anaemia. It also consists of numerous immature RBCs. It also consists of Anisocytoses and Poikilocytes that include Acanthocytes (++), Echinocytes (++), and Target RBCs in the peripheral Blood film.

White blood cells: Shows adequate in distribution with decreased lymphocytes in the peripheral Blood film.

- Immature neutrophils (++)
- Band neutrophils (++)
- T cell lymphocytes (+)
- T cell neutrophils (++)

Platelets: platelets were inadequate in distribution in the peripheral Blood film.

Parasites: *Babesia spp(+).* seen in peripheral blood film.

Figure 2; The black arrow shows red blood cells infected with pear-shaped *Babesia* spp.

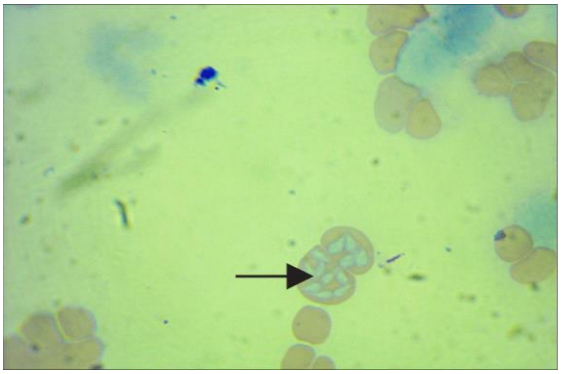


TABLE 1: HAEMATOLOGY RESULT

TEST	RESULT	UNIT	REFERENCE	Alert
WBC	10.6	$X10^9/L$	6.0 – 12.0	
Lymph %	6.9	%	12.0 – 30.0	Low
MID %	9.2	%	5.0 – 20.0	
Neut %	83.1	%	60.0 – 70.0	High
Eos%	0.2	%	0.5-10.0	Low
Bas%	0.6	%	0.0-1.3	
Lymph #	0.7	$X10^9/L$	1.5 – 5.0	Low
MID #	1.0	$X10^9/L$	0.2 – 2.1	
Neut #	8.8	$X10^9/L$	3.0 – 11.0	
Eos #	0.0	$X10^9/L$	0.04-1.62	
Bas #	0.1	$X10^9/L$	0.00-0.12	
RBC	1.7	$X10^{12}/L$	6.0 – 12.0	Low
HB	3.8	g/dl	10.0 – 18.0	Low
HCT	12.9	%	35.0 – 55.0	Low
MCV	78.4	Fl	60.0 – 70.0	High
MCH	23.2	Pg	13.0 – 19.0	High
MCHC	29.6	g/dl	31.0 – 37.0	Low
RDW – SD	74.9	Fl	37.0 – 54.0	High
RDW – CV	22.5	%	11.0 – 15.5	High
PLT	2.0	$X10^9/L$	140 – 400	Low
MPV	N/A	Fl	7.0 – 12.0	
PDW	N/A	%	9.0 – 30.0	

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PCT	N/A	%	0.1-9.99	

TABLE 2: ELECTROLYTES RESULT

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
Sodium	139.1	mmol/l	140.3 – 153.9	Low
Potassium	5.9	mmol/l	3.8 – 5.6	High
Chloride	114.2	mmol/l	102.1 – 117.4	
Bicarbonate	5.6	mmol/l	18.1 – 24.5	Low
Total Calcium	2.6	mmol/l	2.3 – 2.9	
Ionized Calcium	1.3	mmol/l	1.2 – 1.4	
Ph	7.5		7.32 – 7.42	
Anion Gap	19.3	mmol/l	8.0 – 16.0	High

TABLE 3: KIDNEY FUNCTION RESULT

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
BUN	10.6	mmol/l	3.1 – 9.2	High
Creatinine	0.6	Mg/dl	0.5 – 1.6	

TABLE 4: LIVER FUNCTION RESULT

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
Total Protein	79.8	g/l	55.1 – 75.2	High
Albumin	24.6	g/l	25.8 – 39.7	Low
Globulin	55.2	g/l	20.6 – 37.0	High
AST	102.0	U/L	10 – 40	High
ALT	92.2	U/L	7 – 56	High
ALP	18.8	U/L	44.0 – 147.0	Low
Total Bilirubin	2.8	mmol/l	1.71 – 10.3	Low
Direct Bilirubin	0.6	mmol/l	0.0 – 5.1	
Indirect B.	2.2	mmol/l	1.7 – 5.1	
GGT	21.7	U/L	1.0 – 9.7	High

TEST FOR EHRLICHIOSIS- A Rapid test kit (Ehrlichia canis Antibody Rapid Test) was used to test for the presence of *Ehrlichia spp* and it was positive

TREATMENT/MANAGEMENT

Simparica® an ectoparasitic agent containing active ingredient called Sarolaner was administered orally at 2mg/kg once. This was to get rid of the ticks on the body. Hematinic like Folic acid (400mcg daily for a week), ferrous sulphate (10mg/kg tablet orally for 5 days) and vitamin B Complex (400mcg daily for 5 days, intramuscularly) were also administered. This was done in order aid blood formation and reduce anaemia. Dexamethasone injection was administered at 0.5mg/kg for 3 days intramuscularly. This was necessary due to the corneal opacity noticed which is a complication of Ehrlichiosis. Dimenazene acetutate was administered at 3.5mg/kg intramuscularly. Doxycycline was also administered at 10mg/kg daily orally for an initial period of 7 days. By the seventh day of the treatment, cornea opacity had cleared, the mucous membrane was pinkish and the ticks on the body had died. After discharge, tablets of doxycycline were prescribed to the dog to be used at 10mg/kg daily for another 3 weeks to complete the 28 days recommended dosage. The owner was told to bring back the dog after completion of treatment in order to check for presence of infection again but he refused to come. However, he reported that the dog fully recovered, free from ticks, the cornea was clear and appetite was fully restored. He was also counselled on routine tick eradication programs and advised to repeat Simparica® once every month.

DISSCUSSION

Disruption of the erythrocytes by the release of *Babesia* spp. piroplasms accounted for the clinical signs that were observed (Reddy, B.S. et al 2016). Male dogs are considered more susceptible to *Babesia* infection due to more exposure to tick infestation because of their roaming behaviour in search of mates (Daniel L. N., et al 2016). Ocular manifestations like corneal opacity have been associated with several infectious such as canine ehrlichiosis and trypanosomiasis (Bipin K., 2011). Corneal opacity in this case might be due to exudative retinal detachment that resulted from mixed infection. Acute blindness associated with monoclonal gammopathy in dog suffering from canine monocytic ehrlichiosis has been reported Leiva *et al*. (2005). Anaemia and leucocytosis were noticed in the case which might be due to mixed haemoparasitic infection (Wozniak *et al*., 1997; Chhabra *et al*., 2012; Waner, 2008). Deposition of immune complex especially in eyes and joints has been reported in canine ehrlichiosis (Shekhar *et al*., 2011). The dog was treated with Dimenazene aceturate, a known drug used for the treatment of protozoan diseases like Babesiosis and Trypanosomiasis. Doxycycline is a widely used broad spectrum tetracycline antibiotics and it is a drug of choice in canine Ehrlichiosis. The standard protocol of Doxycycline which is 28-day course oral administration was adhered to. In this case, tick control was achieved using the drug Simparica®, which contains the active ingredient Sarolaner (an isoxazoline) a class of

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ectoparasiticides. It is a very effective drug against ticks and flea which covers the dog for a month.

CONCLUSION

The dog's recovery was aided by proper diagnosis, effective control of the ticks and administration of supportive treatment like haematinics to improve blood formation.

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CONFLICT OF INTEREST- None

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