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Clinical management of *Ehrlichia canis* infection in a German shepherd dog: A case report

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Abstract

Canine Monocytic Ehrlichiosis is a tick borne disease of canines having worldwide distribution and is caused by *Ehrlichia canis*. The present case is of a 4 years German shepherd dog presented at Veterinary Clinical Complex, Hyderabad. The dog was presented with the signs of pyrexia, lethargy, congested mucous membranes and oedema of hind limbs and scrotum. There was no improvement in the condition inspite of routine antibiotic therapy at other hospital. Initially blood was tested for presence of blood born parasites by using Rapid Antibody test kit and was found positive for *E. canis*. Further, blood smear examination was done for the confirmatory diagnosis and was found positive for Ehrlichia canis. Faecal smear also tested and was negative for the parasitic ova. Blood and serum was estimated for certain parameters which revealed anaemia, neutrophilic leucocytosis with hepatic and renal insufficiency. The dog was treated symptomatically and specifically with appropriate therapeutic regimen. Dog started showing improvement from third day onwards and recovered completely in one month.

Keywords: Ehrlichiosis, German shepherd dog, rapid antibody test kit, blood smear, scrotal oedema, anaemia and therapy

Introduction

Ehrlichiosis is also known as Canine Monocytic Ehrlichiosis (or) tropical canine pancytopenia. It is distributed worldwide and is a small pleomorphic, gram negative, coccoid, obligatory intracellular bacterium that parasitizes the circulating monocytes, intracytoplasmically in clusters. These organisms enter blood stream and lymphatics and localise in macrophages. Infected macrophages disseminate the infection to other organ systems. Incubation period is about 8-20 days followed by acute, subclinical and chronic infection. *E. canis* infects all breeds of dogs, however German Shepherd appears to be more susceptible to disease and severely affected more than any other breed [Taylor *et al.*, 2016] ^[1]. Dogs which are immuned will recover from infection in acute and sub clinical phases, showing aplastic pancytopenia, severe bleeding and due to septicaemia high mortality is seen [Mylonakis M E and Theodorou K N 2017] ^[2].

Materials and Methods

A four year old male, German Shepherd dog weighing 28 kg body weight was presented to the Veterinary Clinical Complex, College of Veterinary Science, Hyderabad, Telangana, India with the history of dyspepsia, dull, lethargy, fever and swelling of scrotum and hind limbs. Dog was vaccinated and dewormed regularly. Detailed clinical examination revealed, rise in body temperature (103.7^oF), increased respiration rate (45/min), increased heart rate (140/min) and increased pulse (105/min). Mucous membranes were congested [Fig.1] and the dog was not able to walk properly. There was visible swelling of hind limbs, scrotum and penis [Fig. 2A&B]. Palpation of hind quarters revealed the enlargement of popliteal lymph node. Faecal smear was made and examined for the presence of parasitic ova.

A Peripheral blood smear was made by collecting blood from ear vein and subjected for Leishman staining for the presence of haemoprotozoans. Further, blood was collected and serum was separated and subjected to the rapid test by using rapid antigen test kit against four haemoprotozoan infections i.e., Canine Ehrlichiosis, Babesiosis, Anaplasmosis and Canine Heart worm. It is commercially available as 'Canine EHR BAB ANA CHW Combo Test (Asian Tick-4)' manufactured by PetX company. Test has to be done by using serum/ plasma and it works on the principle of lateral flow immune chromatographic assay with the assay time of 5-10 minutes.

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This kit has got good sensitivity and specificity and also friendly to the users. Further, the blood and serum were

analysed for the complete blood picture and serum biochemistry for certain selected parameters.

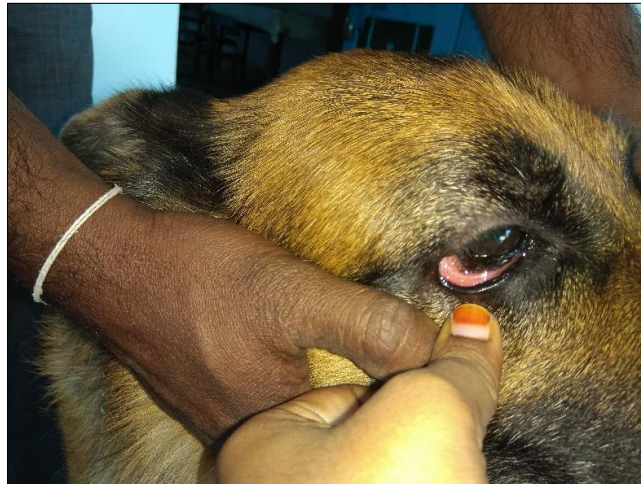


Fig 1: Congested conjunctival mucous membranes in *E. canis* affected dog

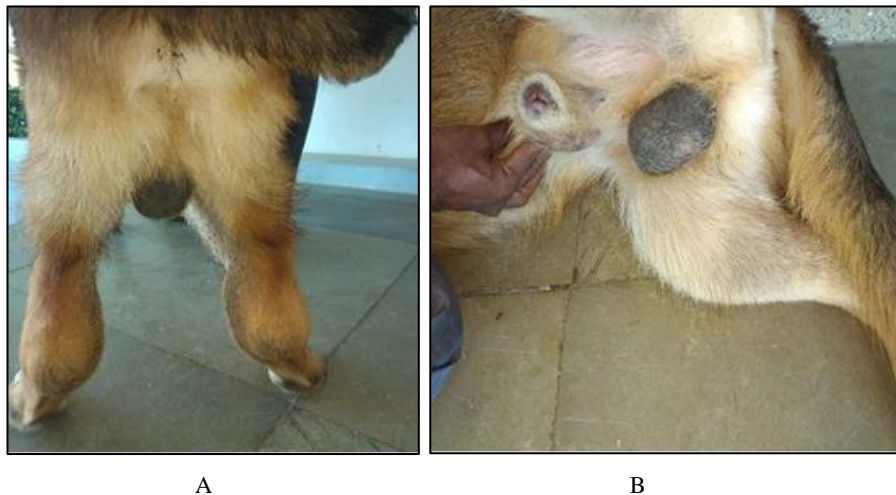


Fig 2 A & B: Swelling of Hindlimbs and scrotum and penis in *E. canis* affected dog

Results

Faecal smear was found negative for the parasitic ova. Rapid antigen test kit for different blood parasites was tested positive for *E. canis* infection. The peripheral blood smear stained with Leishmans was with *E. canis* organisms inside the lymphocytes (Fig. 4). Blood picture revealed decreased concentration of erythrocytes, haemoglobin and monocytes

(Table 1) indicating anaemia. Serum biochemistry revealed decreased Albumin and increased concentration of ALP, ALT, AST, Blood urea nitrogen and creatinine indicating liver and kidney abnormalities (Table 2). According to clinical and laboratory findings the present dog case was confirmed as suffering from Ehrlichiosis with anaemia, oedema and pyrexia.



Fig 3: Rapid Antigen test kit with positive result for *E. canis* infection.

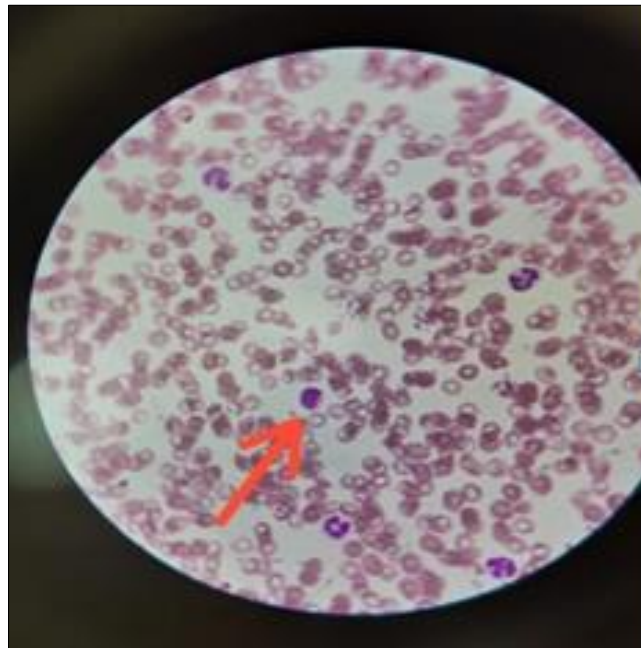


Fig 4: Stained blood smear with *E. canis* organisms inside the lymphocytes

Table 1: Blood analysis findings in Ehrlichiosis affected dog

S. No	Parameters	Values	Normal Range
1.	RBC ($\times 10^6/\mu\text{l}$)	5.99	5.5 – 8.5
2.	Hb (g/dl)	9.7	15 – 20
3.	WBC ($\times 10^3/\mu\text{l}$)	10.3	6 – 12
4.	Lymphocytes (%)	19.4	9 – 100
5.	Monocytes (%)	10.0	9 -100

Table 2: Serological parameters in Ehrlichiosis affected dog

S. No	Parameters	Values	Normal Range
1.	Albumin(g/dl)	2.0	2.2 – 4.0
2.	ALP(U/L)	229.8	14 – 111
3.	ALT(U/L)	162.5	10 – 109
4.	AST(U/L)	144.9	10 – 100
5.	Total protein (g/dl)	6.7	5.7 – 8.9
6.	Creatinine (mg/dl)	5.8	0.6 – 1.4
7.	Blood urea nitrogen (mg/dl)	210.6	12.8 – 53.5

Treatment and Discussion

As the dog's body temperature was very high i.e., 103.7°F treated with Inj: Fevastin 2 ml i.m, The dog has received Inj: Oxytetracycline @ 20 mg/kg body weight i.v mixed with Inj. Normal Saline @ 10 ml/kg body weight i.v and was given for 3 days as the dog was not eating. From fourth day onwards dog started taking little food, so antibiotic therapy was continued with Tab: Doxycycline @ 5 mg/ kg i.v and was continued for 27 days. Dog was treated with Inj: Lasix @ 2.5 mg/ kg i.m initially for 3 days to decrease oedema. Dog was also given Inj: Chloril @ 2 i.m. along with oral supplementation of haematonic syrup Fe-Folate @ 5 ml BID for one month. The dog was recovered completely after one month and was confirmed by negative result in rapid test kit. In the present case, oedema in hind limbs might be due to hypoalbuminemia as per the serological reports showed. Oedema may also associated with decrease in protein uptake, loss of blood, due to vasculitis too, and peripheral loss to oedematous inflammatory fluids [Woody, B.J and Hoskins, J.D 1991] ^[3]. Liver dysfunction is also one of the major reasons for decreased protein production in the body [Reardon, M.J and Pierce, K.R., 1981] ^[4]. Decreased

concentration of serum ALT and AST indicating liver abnormalities is in correlation with the previous findings [D. Barman *et al.*, 2014] ^[5]. Increase in kidney enzymes could be due to acute form of infection resulting in anaemia & neutrophilic leucocytosis [Waner T 2008] ^[6]. The present dog was treated effectively with Doxycycline. Pharmacological action of Doxycycline on microorganism is performed by inhibition of the protein transcription therefore replication of *E. canis* is prevented [Monsalve S B *et al.*, 2017] ^[7].

Conclusion

With the present clinical case, it is concluded that 'rapid antigen test kit' for haemoprotozoans can be helpful as an animal side for the diagnosis of *E. canis* infection as it is difficult to do with the peripheral blood smear staining. This 'veterinary *in vitro*' diagnostic test has got good sensitivity and specificity with its easiness to perform, hence this can be recommended as pen side diagnostic test for the detection of specific haemoprotozoan infections of dogs. Further, dogs with anaemia, swelling of hind limbs, scrotum and penis and not responding to routine antibiotic therapy have to be suspected for *E. canis* infection and has to be diagnosed accordingly. The dogs tested positive for *E. canis* infection can effectively be treated with i.v Doxycycline during initial 3 days and once the appetite returns normal then can be managed with oral antibiotic therapy along with the symptomatic and supportive medication.

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