

Original Research Article

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## Therapeutic management of Ehrlichiosis in German Shepherd Dog: A Case Reports

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### ABSTRACT

A 3-year-old male German Shepherd dog weighing 26 kg is presented to Referral Veterinary Polyclinic and Teaching Veterinary Clinical Complex, ICAR- IVRI, Izatnagar, with the history of reduced food intake, dullness, weakness in all limbs since 1 week, edema of the scrotum and all limbs since 3 days. Clinical examination revealed elevated rectal temperature-104.30 F, tachycardia, increased respiratory rate, pale mucous membrane along with ticks over the body was noticed. Haematological examination showed decreased RBC count-1.93million/cmm, Leucocyte count-8100/cmm, Neutrophils-75.6%, lymphocyte count-20.6%, Monocyte count-3.8%, decreased HB- 4.9g%, Thrombocytopenia-80000/microlitre. Serum biochemistry has shown normal Creatinine value-1.1mg/dl and elevated SGPT value-218 IU/L. On blood smear examination with Giemsa staining, Ehrlichia Morulae were noticed in Monocytes suggestive of Canine Ehrlichiosis.

#### Keywords

edema of the  
scrotum and all  
limbs food intake,  
dullness

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### Introduction

Tick-borne diseases represent a problem of growing importance for public health (Parola *et al.*, 2000). *Ehrlichia canis* is an obligate intracellular rickettsial agent that is transmitted by a brown dog tick i.e. *Rhipicephalus sanguineus* which is considered as the principal vector of this disease. ( Ristic and Holland, 1993). The disease is characterized by a wide variety of clinical signs of which depression, lethargy,

weight loss, anorexia, pyrexia, lymphadenomegaly, splenomegaly, and bleeding tendencies are the most common. Major hematologic abnormalities comprise of thrombocytopenia, mild anemia, and mild leukopenia during the acute stage, mild thrombocytopenia in the subclinical stage, and pancytopenia in the severe chronic stage. The main biochemical abnormalities include hypoalbuminemia, hyperglobulinemia, and hypergammaglobulinemia (Harrus *et al.*, 1997).

The most common and consistent hematological abnormality of dogs infected with *E. Canis* naturally or experimentally is thought to be thrombocytopenia (Waner *et al.*, 1995). Mechanisms assumed to be involved in the pathogenesis of thrombocytopenia in the acute phase of the disease include increased platelet consumption due to inflammatory changes in blood vessel endothelium, increased splenic sequestration of platelets, and immunologic destruction or injury resulting in a significantly decreased platelet life span (Kakoma *et al.*, 1978). *E. canis* causes a potentially fatal disease in dogs that requires rapid and accurate diagnosis to initiate appropriate therapy leading to a favorable prognosis (McBride *et al.*, 2001).

### **Materials and Methods**

A 3-year-old male German Shepherd dog weighing 31 kg is presented to Referral Veterinary Polyclinic and Teaching Veterinary Clinical Complex, ICAR- IVRI, Izatnagar, with the history of reduced food intake, fever, dullness, weakness in all limbs since 1 week, edema of scrotum and limbs since last 3 days. Deworming and Vaccination history was proper.

Clinical examination revealed elevated rectal temperature-104.30 F, Tachycardia(155beats/min), increased respiratory rate, Hepatomegaly, peripheral Lymphadenopathy, pale conjunctival and oral mucous membrane along with ticks noticed over the body. Blood and serum samples were collected for hematology and serum biochemistry, respectively.

The peripheral blood smear was prepared and stained with Giemsa stain after methanol fixation (Sathpathi *et al.*, 2014). The stained blood smear was screened for haemoprotozoa under the light microscope. Haematological

analysis was carried out as per the standard method (Jain, 1986). Biochemical analysis was done with a semi-autoanalyzer. The hemato-biochemical values were compared with normal reference values and interpreted.

### **Results and Discussion**

The Haematological analysis revealed anaemia (decreased level of Haemoglobin, and red blood cell), Thrombocytopenia, normal leucocyte count with neutrophilia. The serum biochemistry showed normal Creatinine value, elevated Alanine aminotransferase (ALT. The detailed haematological and serum biochemical parameters before therapy and after therapy are mentioned in Table 1. The stained peripheral blood smear was positive for Ehrlichia morulae in monocytes (Fig. 1). Based on history, clinical and laboratory findings it was diagnosed as a case of Canine Ehrlichiosis.

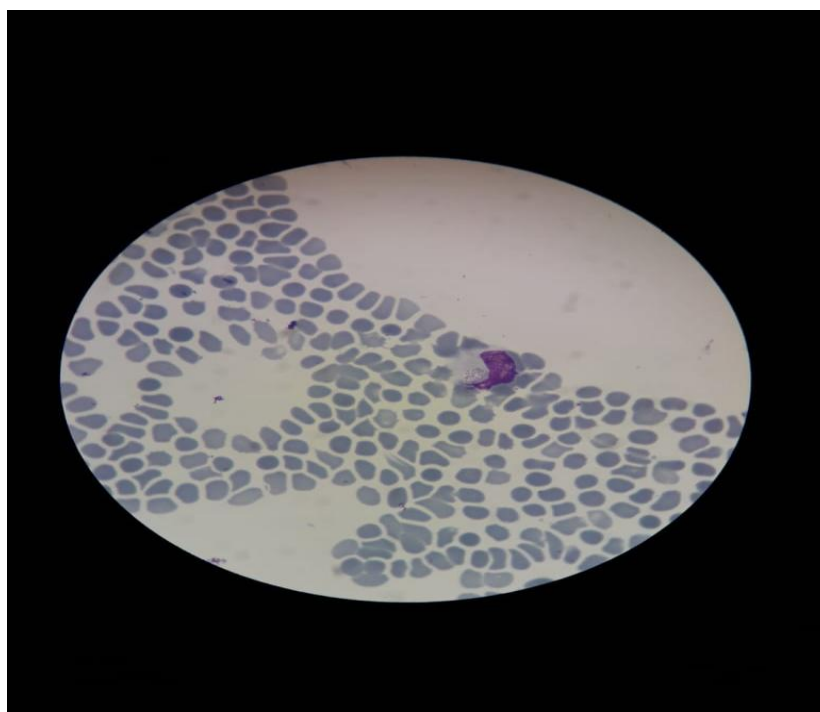
The treatment was started with Tab. Doxycycline @ 5 mg/kg, PO, BID for 28 days. For the management of ticks Fipropfort spot on was applied. Supportive treatment was done with Inj. NS @ 200 ml very slow IV, Inj. Meloxicam @ 0.5 mg/kg, IM, BID, Inj. Ranitidine@ 1 mg/kg, SC, TID, Inj. Eldervet @ 2ml, IV was given for 3 days. Along with this, Tab.Wysolone@1mg/kg bodyweight for 5 days followed by 0.5mg/kg for next 5 days (Tapering dose), Hematinic (Syp. aRBC pet @ 10 ml, PO, BID) and Hepatoprotectant (Syp.Liv-52@ 10 ml, PO, BID) Syrup. Thromb beat @ 10ml BID PO was given for 4 weeks. After 4 weeks of therapy, the dog showed marked improvement in condition. Haemato-biochemical values were found within a normal range and peripheral blood smear was negative for *E. canis* on the 28th day of post-therapy.

**Table.1** Haemato-biochemical changes in a dog before and after therapy

Haematological Parameters				
Parameter	Day 0	Day 28	Reference range*	Key findings
<b>RBC count (millions/mm<sup>3</sup>)</b>	2.79	6.27	5.0-7.9	Anaemia
<b>Hemoglobin (g/dl)</b>	6.3	13.2	12-19	
<b>Total WBC count (10<sup>3</sup> cells/mm<sup>3</sup>)</b>	8.6	11.3	5.0-14.1	
<b>Neutrophils (%)</b>	87	72	58-85	Neutrophilia
<b>Lymphocyte (%)</b>	7.2	22.5	8-21	
<b>Monocytes (%)</b>	3.8	3.5	2-10	
<b>Eosinophils (%)</b>	2	2	0-9	
<b>Basophils (%)</b>	0	0	0-1	
<b>Platelets (lakhs/mm<sup>3</sup>)</b>	0.8	1.86	2.11-6.21	Thrombocytopenia
Serum Biochemical Parameters				
Parameter	Day 0	Day 28	Reference range#	
<b>ALT (U/L)</b>	218.8	127.9	10-109	Elevated-liver specific enzyme
<b>Creatinine (mg/dl)</b>	1.12	0.871	0.5-1.7	

\* March 2012: Haematology reference ranges, 10th edn. The Merck Veterinary Manual

# March 2012: Serum biochemical reference ranges, 10th edn. The Merck Veterinary Manual



**Fig.1** *Ehrlichia canis* morula (arrow) in monocyte (Giemsa stain)

The exact pathogenesis of CME remains unknown. It has been suggested as a mechanism for pathologic alterations and clinical signs are due to Immunologic dysfunction. Increased production of interleukin-1 (IL-1) by antigen-presenting cells and B cells or exogenous pyrogen products of the parasite are responsible for Fever and some clinical signs and symptoms observed in all infected dogs (Gershwin *et al.*, 1995).

These alterations were already manifest between days 10 and 14 after infection, similar to the findings reported in naturally infected and dogs experimentally exposed to *E. canis* by (Huxsoll *et al.*, 1972) and (Pierce *et al.*, 1977), respectively. The clinical findings such as pale mucous membranes, hepatomegaly, lymphadenopathy, splenomegaly, emaciation, increased hair loss and hematological alterations observed in these infected animals have been previously reported in cases of canine ehrlichiosis (Hoskins, 1991; Troy and Forrester, 1990). Thrombocytopenia, leucopenia, and anemia are most frequently observed in CME (Hoskins, 1991; Davoust *et al.*, 1991). Infected dogs presented mild to moderate hematological changes in acute experimental infection for just a few weeks. The tendency for the hematological parameters to return to normal was evident at the end of the experiment. This result may be a consequence of transient suppression of bone marrow activity due to *E. canis* infection (Buhles *et al.*, 1975).

It has been assumed that the pathogenesis of thrombocytopenia is due to Anti-platelet antibodies produced in CME (Harrus *et al.*, 1996). Anemia may explain the observed paleness of mucous membranes and most organs. Lymphadenopathy, splenomegaly, ascites, paleness of mucous membrane, kidney and liver, and discrete pulmonary

congestion were observed at the necropsy of inoculated dogs as has been previously reported in cases of canine ehrlichiosis (Hildebrandt *et al.*, 1970; Hildebrandt *et al.*, 1973 ). observed the same in German Shepherd dogs and posited breed susceptibility (Nyindo *et al.*, 1980).

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