CLINICAL MANAGEMENT OF CANINE EHRLICHIOSIS

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A one year old, male, German Shepherd dog was presented at the Teaching Veterinary Clinical Complex, with the history of fever, anorexia, weakness, intermittent vomiting, epistaxis and tick for few weeks. Physical examinations revealed that the animal had high body temperature (104.2˚F), pale mucous membrane, dehydration, lymphadenopathy and mild splenomegaly on palpation. Haematobiochemical results showed anaemia and severe thrombocytopenia. Total bilirubin, BUN, AST and ALT levels were elevated. Examination of peripheral blood smear revealed presence of morulae of *Ehrlichia Canis* in the monocyte. The case was treated with doxycycline hyclate tablet for 21 days. Supportive therapy included IV infusion of ringer lactate for 7 days, ondansetron injection for 3 days, a liver tonic syrup, a platelet enhancer syrup and a topical nasal drop to stop the epistaxis. Dog started showing recovery 2 days after treatment and re-examination of blood after 21 days did not reveal any parasitaemia.

Keywords: Canine monocytic Doxycycline hyclate, Ehrlichiosis, *E. Canis*, Thrombocytopenia.

Ehrlichiosis is an important tick-borne infectious disease of dogs and other canids, with higher frequency in tropical and subtropical regions. Ehrlichiosis is caused by Ehrlichia canis (*E. canis*), an obligatory gram-negative bacteria which infect monocytes, granulocytes and platelets (Pérez-Macchi *et al*., 2019). The organism is transmitted by various species of ticks such as the brown dog tick, *Rhinocephalus sanguineous* which is endemic worldwide (Paulino *et al.,* 2018). Canine Monocytic Ehrlichiosis (CME) can manifest in three phases *viz.*, acute, sub acute and chronic (Skotarczak, 2003). Common clinical signs of Ehrlichiosis include anaemia, epistaxis, petechiae, ecchymoses, prolonged bleeding during estrus, haematuria or melena associated with thrombocytopenia, thrombocytopathy, or vacuities. Ocular signs are also common in CME. The most common are anterior uveitis, corneal opacity, hyphema, chorioretinal lesions, subretinal hemorrhage, retinal detachment, or blindness (Sainz *et al.,* 2015). Blood tests show anaemia and thrombocytopenia. The lymphocytes may increase and be abnormal in appearance. The purpose of this case study was to provide general outline of the condition of dog from initial stage of infection to recovery phase and treatment response in dog.

Case history and Observations

A one year old, male, German shepherd dog was presented at the Teaching Veterinary Clinical Complex, Faculty of Veterinary Science, Belgachia, Kolkata, West Bengal, with the history of fever, anorexia, weakness, intermittent vomition, epistaxis and tick infestation for few weeks. Physical examinations revealed high body temperature (104.2˚F), pale mucous membrane (Fig A and B), dehydration, lymphadenopathy and mild splenomegaly on palpation. The whole blood (4ml) was collected from the cephalic vein in EDTA and clot activator for routine haematology and serum biochemical analysis. Peripheral blood smear was subjected to direct microscopic examination after staining for detection of haemoparasite. Diagnosis was based on presence of morulae of *E. Canis* (Fig. C) The results of haematological examination are depicted in Table-1. Elevated level of liver enzymes indicates hepatic disturbances which probably resulted in increased blood urea nitrogen (BUN) values.

Fig A: Pale oral mucosa in the affected animal

Fig B. Pale eye mucosa

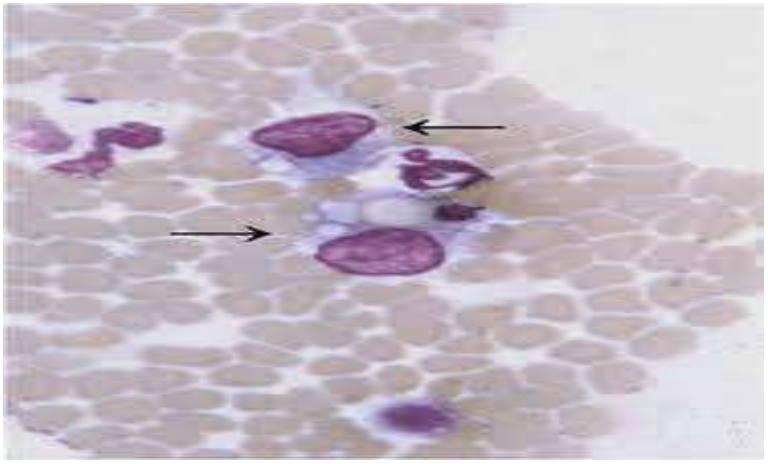

Fig C. Ehrlichia in Blood Smear

Table 1: Alteration of haemato-biochemical parameters before and after treatment

PARAMETERS	PRE TREATMENT (0day)	POST TREATMENT(21st day)
Hb(gm/ dl)	8	13
TEC($X10^6/\mu L$)	4.56	6.2
TLC($X10^3/\mu L$)	8.45	11.2
Neutrophil(%)	69	75
Lymphocytes (%)	25	18
Monocytes(%)	3	5
Eosinophils(%)	3	2
Basophils(%)	0	0
PCV(%)	13.9	30
Platelet count ($X10^3/mm^3$)	0.72	1.96
BUN(mg/dl)	36.4	27.6
Creatinine (mg/dl)	1.2	0.8
ALT(IU/L)	89	67
AST(IU/L)	107	59
ALP(U/L)	196	94
Total billirubin(mg/dl)	2.6	1.3
Total Protien (gm/dl)	4.79	6.32
Albmin (gm/dl)	1.27	3.21
Globulin (gm/dl)	3.52	3.11
A:G	0.36	1.03

Treatment

Case was treated with doxycycline hyclate tablet @10 mg/kg. body wt. orally daily for 21 days. Supportive therapy included IV infusion of ringer lactate @10ml/kg body weight for 7 days, ondansetron injection @0.2mg/kg IV for 3 days, a liver tonic Unomarin® syrup @1sf orally daily, a platelet enhancer Thrombofit® syrup and a topical nasal drop Botroclot to stop the epistaxis. Dog start showing recovery only after 21 days of treatment and re-examination of blood after 21 days did not reveal any parasitaemia.

Results and Discussion

The most important clinical signs were anorexia, pyrexia, pale mucous membrane, lymphadenopathy and nasal bleeding. These findings were similar to thefindungs of Sharma *et. al.,* (2010). Haemoglobin, packed cell volume, and thrombocyte count were declined in the present study. and the findings were corroborated with the findings of Phuyal *et al.,* (2017). The important haematobiochemical findings observed in the present study were anaemia, leukocytosis, neutorpaenia, lymphopenia, thrombocytopenia, eosinophilia followed by hyperbilirubinemia, increased level of AST, ALT and ALP, hypoalbuminemia, hyperglobulinaemia, decrease in albumin and globulin ratio, increase in BUN and creatinine. The decrease in values of Hb, packed cell volume platelets, albumin and globulin ratio and increase in the values of AST, ALT, ALP, globulin and creatinine were found. This findings were corroborated with findings of Bhadesiya and Modi (2015) who recorded the decreased level of Hb, PCV, TEC,TLC and total platelet counts.Thrombocytopenia, anaemia, hypoalbuminemia, increased in ALP, decreased albumin globulin ratio were the most common findings in canine ehrlichiosis.

Lymphocytes and Eosinophils were increased before the treatment which may be due to alteration in homeostasis as well as parasite involvement, which elucidate immune responses and hence overproduction of lymphocytes and monocytes. Neutrophils(69), Monocytes(3) seems low before the treatment as increased lymphocyte exert a cytotoxic effect upon autologous monocytes. Platelets dysfunctions have occurred, due to early removal of platelets at an accelerated rate by antiplatelet antibodies which were formed as a result of interaction of B cells antibody receptor with foreign antigen. Thrombocytopenia in canine ehrlichiosis may be attributed to decreased circulating half-life of platelets during acute phase of infection, reduced adhesiveness of platelets due to antiplatelet antibody, plasma inhibiting factor or direct effect of *E. canis* on circulating platelets or endothelial damage and platelet aggregation. In the affected only one dog haemoglobin and PCV decreased significantly indicating anemia. These findings were in accordance with Bhanuprakash *et al.*, (2015). All these parameters came to normal in 21 days of treatment. Immunological mechanism may be involved in destruction of erythrocytes causing anaemia during acute stage of infection.

Liver tonic are added to protect from adverse effect. Thrombocytopenia is observed due to combined direct and indirect effect of Pathogen. Pathogen has direct effect on life span of platelets and indirect effect on bone marrow that suppress erythropoiesis activities. Thus results thrombocytopenia in infected dog. Decrease in level of platelets in severe cases results bleeding due to lack of clotting factor. Most dogs recover from the acute and subclinical phases when treated with doxycycline or other tetracyclines at appropriate dosages for an adequate period of time. Persistent infections with *E. canis* often remain because complete bacterial clearance is not guaranteed following antibiotic therapy.

Conclusions

The results of this clinical case study demonstrated that administration of doxycycline hyclate @10mg/kg orally twice daily for 21 days along with supportive therapy is effective against *Ehrlichia canis*

with no adverse and toxic effects and the dog recovers without difficulty.

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