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Clinical and haemato-biochemical study on canine ehrlichiosis

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Abstract

The present study was conducted in total 11 dogs (seven Labrador and four German Shepherd dogs) aged between 5 months to 9 years, presented to Veterinary Clinical Complex, Apollo College of Veterinary Medicine, Jaipur during the period of April to August 2023 with the history of inappetence to anorexia, general weakness, fever, weight loss and occasional nasal bleeding (only in 4 cases). Careful examination of axillary, inguinal, neck and brisket region of dogs revealed that ticks were present on the body. Based on history, clinical findings and presence of ticks on the body, the disease was diagnosed tentatively as canine ehrlichiosis. Confirmatory diagnosis was based upon blood smear examination which showed presence of *E. canis* organism (as clusters or colonies) within the cytoplasm of the mononuclear cells. Affected dogs were treated with imidocarb dipropionate, ivermectin and oxytetracycline along with other supportive therapy. All treated dogs showed marked improvement after 2 days of treatment. Clinically, complete recovery was within 4th day of treatment in 7 dogs and within 7th day of treatment in remaining 4 dogs. Imidocarb dipropionate is effective for treatment of canine ehrlichiosis. Prognosis is good in ehrlichiosis if the animal is treated in the early stage but in chronic illness or untreated animals may die. Management of tick infestation is much important to prevent transmission of disease from affected to healthy dogs.

Keywords: Canine ehrlichiosis, *E. canis*, Imidocarb dipropionate, dogs

Introduction

Ehrlichiosis is a universal distributed disease of canine transmitted by arthropod vectors from affected to healthy dogs. It is caused by an obligate intracellular rickettsial parasite called Ehrlichia spp. Different species of Ehrlichia parasites viz. *E. canis*, *E. chaffeensis*, *E. ewingii* and potentially *E. ruminatum* are responsible to cause disease in dogs (Ettinger and Feldman, 2005) [3]. The organisms are considered as leukocytophilic bacteria and they multiply within the cytoplasmic vacuoles of circulating monocyte and tissue macrophages (Chakrabarti A, 2012) [1].

Clinically Ehrlichiosis is characterized by fever, anemia, epistaxis, petechiae, ecchymoses, prolonged bleeding during estrus, hematuria or melena associated with thrombocytopenia, thrombocytopenia, or vasculitis. Ocular signs are also common in canine ehrlichiosis. The most common are anterior uveitis, corneal opacity, hyphema, retinal vessel tortuosity, chorioretinal lesions, subretinal hemorrhage, retinal detachment, or blindness (Sainz *et al.*, 2015) [7].

Acute, latent and chronic forms of the disease are recognized, with the latter usually accompanied by severe haematological and bone marrow dysfunctions. Diagnosis may be confirmed by demonstrating the organisms inside leucocytes or platelets, seen as intracytoplasmic inclusion bodies called morulae (Kuehn and Gaunt, 1985) [6].

Case history

A total 11 dogs, seven Labrador (4 male and 3 female) and four German Shepherd (2 male and 2 female) dogs aged between 5 months to 9 years, presented to Veterinary Clinical Complex, Apollo College of Veterinary Medicine, Jaipur during the period of April to August 2023 with the history of inappetence to anorexia, general weakness, fever, weight loss and occasional nasal bleeding (only in 4 cases). Careful examination of axillary, inguinal, neck and brisket region of dogs revealed presence of ticks on the body.

Detailed clinical examination including, temperature, respiration rate, heart and pulse rate, colour of visible mucous membrane etc was done. Blood smear examination and haematological investigation were also performed. Based on history, clinical findings and presence of ticks on body disease was diagnosed tentatively as canine ehrlichiosis. Confirmatory diagnosis was based upon blood smears examination.

Blood samples from affected dogs were collected from cephalic vein in EDTA containing and without anticoagulant vacutainers. The EDTA containing blood samples were used for estimation of haematological parameters on the same day and without anticoagulant blood samples were used for separation of serum by standard processes for biochemical analysis. Blood smears were prepared from peripheral blood vessels and stained with Giemsa's stain for confirmation of ehrlichiosis by microscopic examination. Blood smears were examined under oil immersion on 100x.

Results and Discussion

Confirmatory diagnosis of canine ehrlichiosis caused *E. canis* was based upon blood smears examination which showed presence of the organism (as clusters or colonies) within cytoplasm of the mononuclear cells. After confirmatory diagnosis, all dogs were treated with injection- normal saline @ 20 ml/kg b.wt., i.v., injection- Imidocarb dipropionate @ 6.6 mg/kg b.wt., s/c. repeat after 14 days, injection- oxytetracycline @ 10 mg/kg b.wt., i.v. slow, injection- vetalgin @ 1ml/kg b.wt., i.m., s.o.s., injection- ondansetron @ 0.2 mg/kg b.wt., i.v. x 3 days, injection- ivermectin @ 0.2 mg/ kg b.wt., s/c once, injection- ferritas @ 1 ml/kg b.wt., i.m. 3 times on alternate day, injection- Tribivet (vit. B-complex) @ 1 ml/20 kg. b.wt., i.v. x 3 days, syrup- advaplat @ 10 ml, p.o., tid x 2 weeks. All dogs showed marked improvement after 2 days of treatment. Clinically, complete recovery was within 4th day of treatment in 7 dogs and within 7th day of treatment in remaining 4 dogs.

Clinical examination revealed inappetence or anorexia, fever (103.49 ± 0.11), increased heart rate (131 ± 3.74), increased respiration rate (44 ± 1.18) depression, emaciation (Fig. 1), lymphadenopathy, ocular discharge, epistaxis (in 4 dogs), ecchymotic haemorrhages (in 9 dogs), vomiting (in 3 dogs), lameness (in 2 dogs), pale mucous membrane (in 7 dogs) and congested mucous membrane (in 4 dogs; Fig. 2) ascites (in 1 dog). Similar clinical findings in canine ehrlichiosis were also reported by previous workers (Chipde *et al.*, 2007; Sharma *et al.*, 2010; Xaxa and Kumar, 2018) [2, 8, 12]

Haemato-biochemical examination revealed decreased TEC (total erythrocytes count), Hb (haemoglobin) concentration, platelets count and albumin whereas, neutrophils count, eosinophils count, lymphocyte count, TLC (total leucocytes count) serum creatinine, globulin, BUN, AST (aspartate aminotransferase), ALP (alkaline phosphatase) and ALT (alanine aminotransferase) were found increased as compared to normal values (Table 1).

Decreased level in Hb and TEC are in agreement with the earlier findings of Harrus *et al.* (2001) [4] and Xaxa and Kumar (2018) [12], who reported that immunological mechanism may be involved causing anaemia due to destruction of erythrocytes in acute stage of infection. Overproduction of lymphocytes and monocytes (causing lymphocytosis and eosinophilia) may be due to change in hemostasis or due to involvement of parasitic infestation, which activate immune responses (Xaxa and Kumar, 2018) [12]. Decreased level of platelets may be due 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 as suggested by Xaxa and Kumar (2018) [12]. Platelets dysfunction 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, which is also described by Smitha *et al.*, (2002) [10] and Shekhar *et al.*, (2011) [9].

Increased level of aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase are due to hepatocyte damage in acute phase. Elevation in the level of blood urea nitrogen, creatinine, globulin, bilirubin and reduction in albumin can be due to protein losing renal disorders as a result of immune complex glomerulonephritis with consequent proteinuria and azotemia (Kottadammane *et al.*, 2017) [5]. Centrilobular hepatitis with hypoxic liver damage could be the possible mechanism that resulted in significant changes in hepatic enzymes and decreased albumin levels (Taboada and Lobetti, 2006) [11].

Table 1: Average haemato-biochemical parameters in ehrlichiosis affected dogs

Parameters	Results	Normal Values
TEC	$4.1 \times 10^6 / \mu\text{l}$	$5.5-8.5 \times 10^6 / \mu\text{l}$
haemoglobin	8.4 gm/dl	12-18 gm/dl
platelets	$1.29 \times 10^5 / \mu\text{l}$	$2-9 \times 10^5 / \mu\text{l}$
neutrophils	72%	60-70%
eosinophils	09%	2-7%
lymphocyte	19%	8-18%
TLC	$26.7 \times 10^3 / \mu\text{l}$	$5-17 \times 10^3 / \mu\text{l}$
albumin	1.8 gm/dl	2.3-3.1 gm/dl
globulin	4.9 gm/dl	2.7-4.4 gm/dl
creatinine	1.89 mg/dl	0.5- 1.6 mg/dl
BUN	32.3 mg/dl	8.8- 25.9 mg/dl
AST	81.4 U/L	9-49 U/L
ALP	237 U/L	1-114 U/L
ALT	121.6 U/L	8-57 U/L



Fig 1: Emaciated condition of ehrlichiosis affected GSD dog.



Fig 2: Congested mucous membrane in ehrlichiosis affected dog

Conclusion

Ehrlichiosis is a universal distributed disease transmitted by ticks and may affect dogs of all age group. Blood smear examination is simple and rapid method for diagnosis of ehrlichiosis. Thrombocytopenia is frequently observed in ehrlichiosis affected dogs and correlation with blood smears examination would be important for early diagnosis of disease. Imidocarb dipropionate is effective for treatment of canine ehrlichiosis. Prognosis is good in ehrlichiosis if animal is treated in early stage but in chronic illness or untreated animals may die. Management of tick infestation is much important to prevent transmission of disease from affected to healthy dogs.

References

1. Chakrabarti A. Rickettsial Diseases. In: A Text Book of Preventive Veterinary Medicine. 5th ed. Kalyani Publishers; c2012. p. 715-734.
2. Chipde VS, Rode AM, Pradhan MS, Dakshinkar NP, Sarode DB. Comparative efficacy of combination of Oxytetracycline and doxycycline and doxycycline alone in canine Ehrlichiosis. Royal Veterinary Journal of India. 2007;3(II):74-77.
3. Ettinger SJ, Feldman EC. Obligate Intracellular Bacterial Pathogens. In: Textbook of Veterinary Internal Medicine. 6th ed. Elsevier Saunders; c2005. p. 631-636.
4. Harrus S, Day MJ, Waner T, Bark H. Presence of immunocomplexes, and absence of antinuclear antibodies in sera of dogs naturally and experimentally infected with Ehrlichia canis. Vet Microbiol. 2001;83:343-49.
5. Kottadamane MR, Dhaliwal PS, Singla LD. Diagnosis and treatment of canine monocytic ehrlichiosis in a boxer breed of dog—a case report. Int J Sci Environ Technol. 2017;5:3099-3105.
6. Kuehn N, Gaunt S. Clinical and hematological finding in canine ehrlichiosis. J Am Vet Med Assoc. 1985;186:355-358.
7. Sainz A, Roura X, Miro G, Estrada-Pena A, Kohn B, Harrus S, *et al.* Guideline for veterinary practitioners on canine ehrlichiosis and anaplasmosis in Europe. Parasit Vectors. 2015, 8(75).
8. Sharma DK, Bhuyan D, Phangchoo CV, Baishya BC. Efficacy of Oxytetracycline and doxycycline in the treatment of canine Ehrlichiosis. Intas Polivet. 2010;11(I):77-79.

9. Shekhar P, Kumar B, Kumar A, Samantaray S. Canine Ehrlichiosis and associated Corneal Opacity in Dogs - A clinical study of 4 cases. Intas Polivet. 2011;12(I):87-89.
10. Smitha JP. Canine Ehrlichiosis- An overview. Intas Polivet. 2002;3(II):260-265.
11. Taboada J, Lobetti R. Babesiosis. In: Greene CE, editor. Infectious Diseases of the Dog and Cat. 3rd ed. Philadelphia, PA: WB Saunders; c2006. p. 722.
12. Xaxa LS, Kumar P. Therapeutic Management of E. canis in DOG. Int J Curr Microbiol Appl Sci. 2018;7(1):3335-3339.