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Ehrlichia canis Infection in a Labrador Retriever Dog: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

A six-year-old Labrador retriever dog with a history of fever, inappetence, and unilateral epistaxis was presented to the Referral Veterinary Clinical Complex, Indian Veterinary Research Institute, Izatnagar. Clinical examination revealed the dog had pyrexia, an enlarged peripheral lymph node, and the presence of ticks on the body. The dog was suspected of having a haemoprotozoan infection, and a thin peripheral blood smear was submitted to the Division of Parasitology, Indian Veterinary Research Institute, Izatanagar, Bareilly, for examination. A blood smear was screened for haemoprotozoan examination using Giemsa's stain,

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which showed positivity for *Ehrlichia canis*. Treatment was initiated with Doxycycline at 10 mg/kg B.wt. orally once for 28 days, along with supportive therapy, which resulted in a significant improvement in the dog's condition. An incidence of *E. canis* was reported from the Bareilly district of Uttar Pradesh.

Keywords: Ehrlichia canis; Dog; Doxycycline; Rickettsia; haemoprotozoan; etc.

1. INTRODUCTION

Ehrlichiosis is caused by a group of emerging rickettsial tick-borne infectious agent, which are gram-negative obligate intracellular bacteria of the genus *Ehrlichia,* family *Anaplasmataceae* [1-2]. Despite the fact that the majority of the species in this family are not zoonotic, *A. phagocytophilum* and *E. chaffeensis* are zoonotic and pose considerable public health concerns and cause severe economic losses. It came to be known as a serious disease after military dogs returning from Vietnam in the 1970s were found to be affected [3]. The parasite *E. canis* is spread via the bite of the brown dog tick, *Rhipicephalus sanguineus*, and causes severe clinical signs in affected animals [4-5]. Infection with *E. canis* primarily occurs during the warm season, when the vector tick is active [6].

The brown dog tick is the primary vector of *E. canis*, transferring the infection across hosts via blood feeding. The pathogenesis begins with an 8 to 20-day incubation period [7], followed by acute, subclinical, and, in some cases, chronic phases. Once transmitted, *E. canis* infects mononuclear phagocytic cells mostly monocytes. Infected monocytes typically have one or two morulae which can be demonstrated on peripheral blood smear [8].

The disease is clinically distinguished by fever, anorexia, lymphadenopathy, and a sharp reduction in cellular blood components, most commonly thrombocytopenia [9-10]. In this study, a dog infected with *Ehrlichia canis* was diagnosed conventionally, and the prevalence and control methods in India were discussed.

1.1 Clinical Presentation of the Animal

A six-year-old Labrador retriever breed of dog was presented to Referral Veterinary Clinical Complex, with the history of fever, inappetance and unilateral epistaxis. Thorough clinical examination of the dog revealed that dog had pyrexia (103.9°F), peripheral lymphadenopathy, petechial hemorrhages on the ventral abdomen and ticks found on the body. The animal was suspected for haemoprotozoan infection and thus thin peripheral blood smear prepared from ear vein was sent to the Division of Parasitology, Indian Veterinary Research Institute, Izatanagar, Bareilly for haemoprotozoan examination.

1.2 Laboratory Examination

A 1mL blood sample was obtained in an EDTA vial and sent to the laboratory. A routine complete blood count revealed anaemia (Hb: 7.5mg/dL) and thrombocytopenia (57000/cmm).

2. MATERIALS AND METHODS

After fixing the thin blood smear for one minute in methanol, the sample was stained with Giemsa's stain at a dilution of 1:10 with water, forming a working solution, and was maintained for 40minutes. The slide was then rinsed with tap water, dried, and focused using a compound binocular light microscope with oil immersion. Microscopic examination of thin blood smear stained with Giemsa stain showed presence of pale blue bodies in the monocytes which were suggestive of morulae of *Ehrlichia canis* as shown in the Fig. 1.

2.1 Treatment Protocol

Based on history, clinical examination and laboratory investigation findings, the present case was diagnosed as a case of *Ehrlichia Canis* infection in a dog. Treatment was initiated according to standard protocol using Doxycycline at the dose rate of 10 mg/Kg. B.wt once daily orally for 28 days and Pantoprazole at the dose rate of 1 mg/Kg. B.wt once daily orally for 28 before food. Supportive therapy consisting of fluid therapy, styptics, hematinics and carioca papaya extract was also initiated. To combat tick infestation spot on Fipronil and S-Methoprene was applied topically. A significant improvement in the condition of animal was noticed after 28days of therapy. Again, peripheral blood smear examination was negative for *Ehrlichia Canis.*

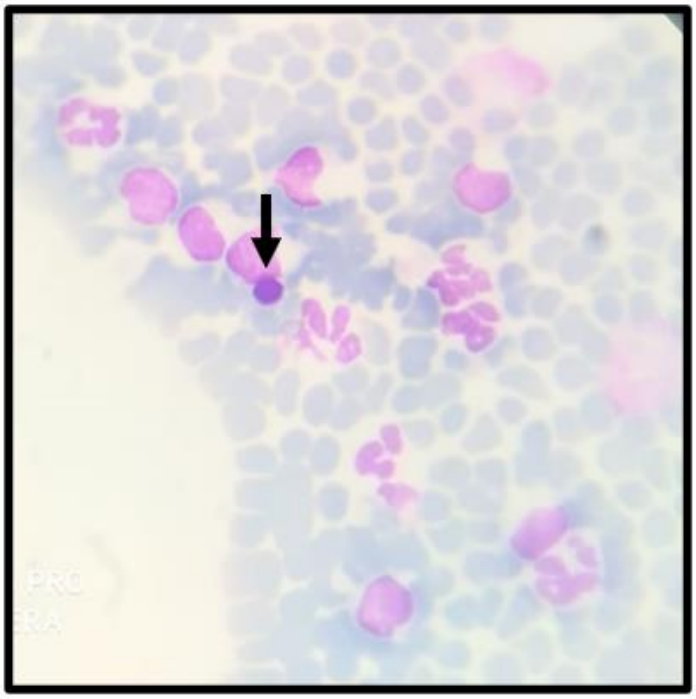

Fig. 1 *Ehrlichia Canis* morulae in monocytes stained with Giemsa's stain (1000X)

3. RESULTS AND DISCUSSION

Brouqui and Raoult [11], Gahalot et al. [12] and Sinha et al. [13] reported that doxycycline and short and long acting tetracycline are effective in the successful management of *E. Canis* infection in a dogs. The treatment of *E. canis* infections is considered effective when dogs improve clinically, haematology and biochemistry results return to regular, and the microorganism is no longer detectable in the body. The few studies that examined the prevalence of canine ehrlichiosis in India using a regular examination of stained blood smears found prevalences of 0.35% (n = 752) in Punjab, 18.9% in Nagpur (n = 238), and 55% in stray dogs in Maharashtra [14]. Kumar et al. [15] reported 3.55 % prevalence of *E. Canis* in and around Meerut region of Uttar Pradesh. Behera et al. [16] revealed that the nested polymerase chain reaction proved to be highly sensitive in detecting acute cases, followed by the buffy coat and blood smear examination. Singla et al. [17] found that *E. canis* is second most tick born pathogen affecting dog following *B. gibsoni* in a Punjab state of India. He also added that infection rate is higher during pre-monsoon season that is summer.

Major challenges that may arise with *E.canis* treatment include managing epistasis in a clinical setting and managing thrombocytopaenia. Furthermore, *E. canis* is not always detectable on slides, hence advanced diagnostic modalities such as PCR should be considered for diagnosis. Neer et al. [18] concluded that even after complete recovery from an infection, animals do not get lifelong immunity, and there is still a risk of reinfection. Aziz et al. [19] suggested that control of vector by spraying suitable acaricides at regular intervals, physical removal of ticks, or monitoring of environmental parameters associated with tick proliferation, are key control measures in combating *Ehrlichiosis*.

4. CONCLUSION

Early diagnosis of *E. canis* is important for successful treatment at an early stage, preventing a chronic course. Therapeutic management with doxycycline along with supportive therapy could be useful for the management of *E. canis*-infected dogs.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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