Case Report

CANINE EHRLICHIOSIS AND TRIPLE THERAPY : A CASE REPORT

M. Jeevitha[1], E. Tamileniyan[1], K. Karthika*[2], A. Latchumikanthan[3], M. Veeraselvam[2] and M. Saravanan[4]

Department of Veterinary Medicine
Veterinary College and Research Institute
Tamil Nadu Veterinary and Animal Sciences University
Orathanadu – 614 625, Thanjavur

ABSTRACT

A two-year-old female Dobermann dog was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu, Tamil Nadu Veterinary and Animal Sciences University, with a history of unilateral epistaxis, dullness, and inappetence. Clinical examination revealed the presence of ticks all over the body surface and they were morphologically identified as Rhipicephalus sanguineus. Blood samples were analyzed for haemato-biochemical parameters and blood parasites. Giemsa stained blood smear revealed the presence of morulae inclusion over monocytes. The dog was treated with a triple therapy protocol, and supportive care was provided. The dog exhibited signs of recovery from the third day of treatment. Follow-up examination on the seventh day revealed the absence of morulae stage of Ehrlichia spp. and a gradual increase in blood cells.

Keywords: Dobermann, Doxycycline, Ehrlichiosis, *Rhipicephalus sanguineus,* Triple therapy

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INTRODUCTION

Ehrlichia spp., *Babesia* spp., *and Hepatozoon* spp. are the major haemoprotozoan infections that affect the canine population in tropical and subtropical regions of the world and cause fever, anaemia, thrombocytopenia, and jaundice (Sahu *et al.,* 2014). Ehrlichiosis is a devastating protozoan disease that affects canines and caused by an intracellular gram-negative bacterium belonging to the family Anaplasmataceae and the genus *Ehrlichia*. *Ehrlichiacanis, E. ewingii,* and *E. chaffeensis* are the three primary species under the genus *Ehrlichia.* It can be referred to as tracker dog

[1] UG Student, Veterinary College and Research Institute, Orathanadu
[2] Assistant Professor, corresponding author Email id: karthika1988.6@gmail.com
[3] Assistant Professor, Dept. of Veterinary Parasitology, VC&RI, Orathanadu
[4] Assistant Professor and Head, Dept. of Veterinary Medicine, VC&RI, Orathanadu

disease or tropical canine pancytopenia and was initially recognised as a serious illness in the 1970s when military dogs returning from Vietnam were found to be infected (Karthika, 2020). Compared to other dogs, German shepherds, Doberman pinschers, Belgium Malinois, and Siberian Huskies tend to be developing a more severe form of this disease. The disease is of global significance in canines and is spread through the bite of the brown dog tick, *Rhipicephalus sanguineus*, and results in severe clinical signs (Bark *et al.,* 1998).

Dogs do not transmit infection to other dogs directly. A cycle of transmission between ticks and dogs maintains the disease in existence. The primary aim of the study was to evaluate the effectiveness of a triple therapy protocol (clindamycin, metronidazole, and doxycycline) (Nandhini *et al.,* 2016) in treating a case of ehrlichiosis and focus was on observing the dog's clinical response and recovery, emphasizing the impact of the triple therapy on the eradication of *Ehrlichia* spp.

MATERIALS AND METHODS

A two years old female Dobermann dog was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu, Tamil Nadu Veterinary and Animal Sciences University with the history of unilateral epistaxis from left nostril, dullness and inappetence. The dog was subjected to clinical examination to analyse the vital parameters. Physical examination of the dog revealed the presence of ticks over the body surface which was collected in 70% alcohol for morphological identification. The collected ticks were then subjected to dehydration using ascending grades of alcohol and cleared with xylene (Soulsby, 1982). Blood samples were collected for haemato-biochemical analysis and also for screening blood parasites. Thin blood smears were made and stained using Giemsa. Buffy coat smear was also prepared and stained with Giemsa stain. The slides were examined under a compound microscope at a 100X oil immersion. The dog was then treated with triple therapy protocol using clindamycin (CLINDAPET®) @ 11 mg/kg once daily metronidazole (FLAGYL®) @ 15 mg/kg once daily and doxycycline (DOXYKO®) @ 5 mg/kg once daily orally for 15 days. Ivermectin (0.2 mg/kg) injection and TICKFREE® spot-on for controlling tick infestation were given. Supportive therapy with THROMBOLIV® hematinics @ 5 ml once daily and TEFROLI FORTE® liver supplement @ 5 ml once daily were also provided.

RESULTS AND DISCUSSION

Clinical examination revealed that the dog was anaemic. Ultrasonography revealed splenomegaly in the affected animal. The ticks collected from the dog revealed hexagonal basis capitulum, bifid first coxa and adanal plates which confirmed them as brown dog tick, *Rhipicephalus sanguineus* (Fig. 1). Giemsa stained buffy coat blood smear revealed morula stage of *Ehrlichia* spp. in the cytoplasm of monocytes (Fig. 2). Haematology revealed anaemia and monocytosis (Table 1). Animals showed positive signs of recovery from the 3rd day of treatment. Post clinical examination of

animal (7thday) confirmed the absence of the morulae stage of *Erhlichia* spp., in smear and gradual improvement in blood cells.

Table. 1. Haematology of the infected dog

Erythrocytes	3.4 X 10^6/µL
Haemoglobin	6 g/dL
PCV	22 %
Neutrophil	64 %
Basophil	3 %
Eosinophil	1 %
Monocyte	12 %
Lymphocytes	20%

Generally, ehrlichiosis can be suspected in dogs with signs of pale or blanched mucous membrane, pancytopenia, thrombocytopenia, epistaxis, ecchymotic haemorrhages, neurological signs and previous history of tick infestation (Frank and Breitschwerdt, 1999). Most of the signs were observed in the present case. Tetracycline, a known hepatotoxic drug (Liénart *et al.,* 1992), was avoided for the treatment. Triple therapy protocol using a combination of clindamycin, metronidazole and doxycycline (Marshall Protocol) (Nandhini *et al.,* 2016) was attempted in the present case for the first time in Cauvery Delta region of Tamil Nadu.

Ehrlichiosis is transmitted by two species of ticks viz., *Rhipicephalus sanguineus* (Brown Dog Tick), (Groves *et al.,* 1975) and *Amblyomma americanum* (Lone Star Tick). Filippova (1994) reported that *E. canis* developed in the salivary glands of *R. sanguineus* and were able to transmit it to an uninfected dog via bite. German shepherd and Siberian huskies showed more severe form of ehrlichiosis due to their reduced cell mediated immune response and hence, these breeds have a poor prognosis (Nyindo *et al.,* 1980). During the chronic form of the disease, the antibody production occurs, subsequent binding on the membranes of erythrocytes and platelets may results in their destruction leading to anemia and thrombocytopenia (Taylor *et al*., 2007). Triple therapy, which has demonstrated efficacy in the treatment of canine babesiosis, has been employed in canine ehrlichiosis as well, when the animal was suspected for clinical/ latent concurrent infections and it is highly effective compared to single therapy. The combination of clindamycin, metronidazole and doxycycline decreased infection levels and reduced clinical signs of haemoprotozoan infection. However, Nandhini *et al.* (2016) suggest that clindamycin may not effectively eradicate parasites from the peripheral blood, but may increase cellular and humoral immunity, leading to improved clinical outcomes. A combination medication of clindamycin, metronidazole and doxycycline has been recommended as an effective and safe treatment for haemoprotozoan infection in canines.

Fig. 1. *Rhipicephalus sanguineus*– Hexagonal basis capitulum, Bifid 1st Coxae, Adanal plate

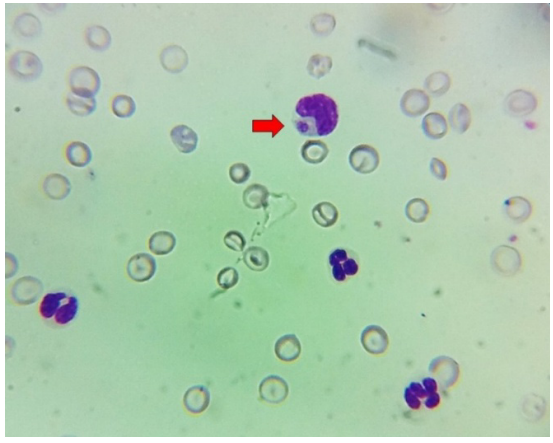

Fig. 2. Morula stage of *Ehrlichia* sp. in canine monocytes

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