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Canine Ehrlichiosis: An Overview

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Introduction

Canine vector borne diseases are group of globally distributed and rapidly spreading illnesses which are generally caused by a wide range of infectious pathogens and transmitted by variety of vectors.

Canine Monocytic Ehrlichiosis (CME) is one of the important vector-borne diseases of animals of family *canidae*. It is tick borne and usually caused by Rickettsial organism *Ehrlichia canis.* There are many synonyms of the disease i.e., Canine rickettsiosis, canine hemorrhagic fever, canine typhus, tracker dog disease, tropical canine pancytopenia.

The disease has been identified by first time in 1935 in algeria by Donatien and Lestoquard. Its tick born nature was also found in 1935. In India, the first case of CME was reported by Mudaliar *et al.* in 1944. Groves *et al.*, in 1975 stated that many American military dogs were died due to CME during Vietnam war of 1970.

Etiology

The disease is caused by a rickettsial bacteria known as *Ehrlichia*. The organisms are considered as leukocytophillic bacteria and they multiply within cytoplasmic vacuoles of circulating monocytes and tissue macrophages. Organisms are gram-negative, obligatory intracellular and appears as small clusters of cocci within mononuclear cells.

At least five tick-transmitted *Ehrlichia* species have been documented to infect dogs, potentially causing the clinical disease. *Ehrlichia canis* was the first species recognized to infect dogs and is the principal cause of Canine Monocytic Ehrlichiosis (CME). *Ehrlichia chaffeensis*, the cause of Human Monocytic Ehrlichiosis, has recently emerged as an infrequent cause of clinical disease in the dog, indistinguishable from that caused by *E. canis*. *Ehrlichia ewingii*, is the cause of canine granulocytic Ehrlichiosis. *Ehrlichia ruminantium*, the cause of Heartwater disease in cattle, has been

molecularly detected in the blood of healthy dogs or dogs presented with symptoms suggestive of Ehrlichiosis, in the context of negative serological and molecular testing for *E. canis*. *Ehrlichia muris*, has recently been identified in an ill dog from northern Minnesota that was seronegative to *E. canis*.

Clinical findings

Fever (occasionally hypothermia in profoundly pancytopenic dogs), depression/lethargy, anorexia. lymphadenomegaly, splenomegaly, mucosal pallor, ocular abnormalities and bleeding tendency are typical clinical manifestations in the naturally-occurring disease. Tick infestation may be seen, especially in the acute phase of the disease, while ulcerative stomatitis and necrotic glossitis, hind limb and/or scrotal edema, bacterial pyoderma, icterus and central nervous system signs such as seizures, ataxia, vestibular dysfunction and cervical pain, have been more frequently reported in chronic CME.

Bleeding diathesis also more common and severe in the chronic phase of CME. It is manifested typically as cutaneous and mucosal petechiae and ecchymoses, hyphema, epistaxis, hematuria, melena, prolonged bleeding from venipuncture sites or intraoperative bleeding.

Neuromuscular signs generally exhibited as central nervous system symptoms i.e., ataxia, seizures, paresis, twitching, hyperaesthesia etc are caused due to meningitis or meningeal bleeding. Ocular lesions are commonly seen in CME, and may be the sole presenting complaint. Anterior or posterior uveitis is the most prevalent manifestation. Ocular discharge, blepharitis, conjunctivitis, corneal ulceration, painful necrotic scleritis, secondary glaucoma and retinal hemorrhage and/or detachment leading to blindness have also been.

Sub-clinical phase of disease, there is no or very mild evident clinical signs may be present those also may go unnoticed. Organisms may sequester within the spleen and evade the host immune systems through antigenic variation.

Diagnosis

The diagnosis of CME can be achieved by a combination of clinical findings, hematology and serological tests and molecular techniques.

Zoonotic aspects

Ehrichia spp. of the zoonotic importance are *E. chaffeensis* and *E. ewingii*. They are found as a cause of Human Monocytic Ehrlichiosis and Human Granulocytic Ehrlichiosis. They are transmitted by tick *Amblyomma americanum* (lone star tick).