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Popular Article

## Canine Ehrlichiosis – An Overview

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### Introduction

Canine ehrlichiosis is caused by gram-negative, obligate intracellular, pleomorphic bacteria of the genus *Ehrlichia* (order Rickettsiales, family Anaplasmataceae). *Ehrlichia* spp. infect primarily leukocytes, forming intracytoplasmic, membrane-bound bacterial aggregates, called morulae (Sainz et al., 2015). At least five tick-transmitted *Ehrlichia* species have been documented to infect dogs, potentially causing the clinical disease (Sainz et al., 2015; Harrus et al., 2012). *Ehrlichia canis* was the first species recognized to infect dogs and is the principal cause of canine monocytic ehrlichiosis (CME) [Sainz et al., 2015, Donatien et al., 1935, Neer et al., 2002]. However, currently, this disease has a global distribution mainly in tropical and subtropical regions. (Kukreti et al, 2018). *Ehrlichia* spp. infect primarily leukocytes, forming intracytoplasmic, membrane-bound bacterial aggregates, called morulae (Sainz et al., 2015). The course of infection is divided into acute, subclinical and chronic phases (Harrus et al., 2012).

### Taxonomy

Three different *Ehrlichia* species can cause canine ehrlichiosis: *E. canis*, *E. chaffeensis* and *E. ewingii* (see Tab. 1). *E. canis* causes canine monocytic ehrlichiosis (CME). This disease, also known as tropical canine pancytopenia, canine rickettsiosis or canine hemorrhagic fever, was first described in Algeria in 1935 by Donatien and Lestoquard. CME has since been reported in many



parts of the world, mainly in the tropical and subtropical regions. However, the geographical distribution of *E. canis* is expanding alongside that of its main tick vector, the Brown Dog tick, *Rhipicephalus sanguineus*. *E. canis* form microcolonies within a membranelined intracellular vacuole (so-called morula), primarily in monocytes and macrophages of mammalian hosts. The pathogen replicates only in the cytoplasm of monocytic cells, and the formation of morulae is a defining characteristic that can be used for diagnosis.

**Table 1: Three different *Ehrlichia* species can cause canine ehrlichiosis**

Species	Common name	Host	Cells most commonly infected	Primary vectors
<i>Ehrlichia canis</i>	Canine Monocytic Ehrlichiosis (CME)	Dogs and other members of the family Canidae, cats, humans	Primarily mono -nuclear cells (Monocytes and lymphocytes)	<i>Rhipicephalus sanguineus</i> , <i>Dermacentor variabilis</i>
<i>E. chaffensis</i>	Human Monocytic Ehrlichiosis (HME)	Humans, deer, horses, rodents	Monocytes, macrophages	<i>Amblyomma americanum</i> , <i>Dermacentor variabilis</i>
<i>E. ewingii</i>	Canine Granulocytic Ehrlichiosis (CGE), Human Monocytic Ehrlichiosis (HME)	Dogs, humans	Primarily neutrophils and eosinophils	<i>Amblyomma americanum</i> , <i>Otobius megnini</i>

### Life cycle

- Infection is transmitted to dog through bite of infected *R. sanguineus*
- Transmission in tick occurs transtadially
- Larvae & nymphs become infected while feeding on rickettsaemic dogs and transmit infection to host after moulting to nymph & adult respectively.

### Pathogenesis

- Incubation period - 8-20 days; organism multiply in macrophage of mononuclear phagocytic system by binary fission
- Thrombocytopenia
- CME has 3 phases
- Acute phase
- Subclinical phase
- Chronic phase



### Acute phase:

- Develops 1-3 weeks after tick bite & lasts for 2-4 weeks
- Fever, anemia, depression, loss of appetite
- Stiffness and joint pain
- Liver, lymph node, spleen enlarged

### Sub-clinical phase:

Animal may appear normal or show slight anemia

- Dogs remain persistent carriers in this phase
- Platelets subnormal

### Chronic phase:

- Tropical pancytopenia occurs due to bone marrow hypoplasia
- Affected animals develop extensive serosal and mucosal haemorrhage
- Epistaxis, bleeding from inner aspect of thigh & forearm also occurs
- Animals prone to renal infection

### Clinical signs:

- Fever, lethargy, weight loss, loss of appetite, abnormal bleeding
- Enlarged lymphnode, enlarged spleen, pain & stiffness
- Anterior uveitis, chorioretinitis, & retinal hemorrhage

### Diagnosis:

Blood smear examination  
Examination of buffy coat  
Lymphnode aspirate

### Treatment:

- Oxytetracycline @7.5-10 mg/kg every 8hrs for 21-28 days or doxycycline @ 5mg/kg every 12hrs for 21-28days
- Supportive treatment
- Severe cases- blood transfusion

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