



SHORT COMMUNICATION

A Retrospective Study of Canine Ehrlichiosis in Kenya

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ABSTRACT

A retrospective study was conducted on 514 dogs infected with ehrlichiosis of which 54.4% were males and 45.6% were females. The German Shepherd Dogs were over represented with 42.6%. The Spitz had the lowest incidence at 1%. Analysis showed the most common clinical signs in all dogs in this study were lymphadenomegaly 59.3%, congestion of mucous membranes 48.7%, inappetance 43.7%, a pounding heart 28.4%, pale mucous membranes 21.3%, harsh lung sounds 20.4% and vomiting 19.8%. Concurrent infections were identified in 36.4% of ehrlichia infected dogs.

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INTRODUCTION

Ehrlichiosis are tick borne diseases caused by obligate intracellular α -proteobacteria belonging to the genera *Ehrlichia*. *Ehrlichia canis*, was first recognized as a distinct clinical entity in Algeria in 1935. It has since been acknowledged worldwide as an important infectious disease of dogs and other canids with a higher frequency in tropical and sub tropical regions (Suto *et al.*, 2001). Based on the degree of similarity of the 16S rRNA genes of the species Dumler *et al.* (2001) proposed a new classification of these pathogens into *Anaplasma phagocytophilum*, *Neorickettsia sennetsu*, *Ehrlichia canis*, *Ehrlichia ewingii* and *Ehrlichia chaffeensis*.

The classic ehrlichiosis is an acute to chronic disease caused by *Ehrlichia canis*. Canine monocytic ehrlichiosis may be manifested in dogs by symptoms such as fever, depression, and dyspnea, anorexia and a slight weight loss in the acute phase. The subclinical phase of persistent ehrlichial infection and mild thrombocytopenia follows the acute phase and may last 40 to 120 days or years. The chronic phase is characterized by hemorrhages, epistaxis and edema in addition to the clinical signs and laboratory findings of the acute phase, which are often complicated by superinfection with other organisms (Unver, *et al.*, 2001). The disease was first reported in dogs in Nairobi, Kenya by Danks (1937) and Murray (1968). However, at this stage the etiological cause was unknown. Later,

Ehrlichia canis was conformed in East Africa using cell culture isolation and indirect florescent antibody tests (Kaminjolo, *et al.*, 1976) and using serology in free ranging jackals in Kenya (Alexander, *et al.*, 1994). Price (1980) has described clinical and hematological features of natural and experimental canine ehrlichiosis. Although ehrlichiosis is a common clinical entity, there are limited scientific reports on the clinical presentation of the disease in Kenya. This information adds to understanding the prevalence and clinical features of ehrlichiosis particularly where confirmatory diagnostic tools are not readily available.

MATERIALS AND METHODS

Involved all cases seen at the Clinic from the case records in Small Animal Clinic (SAC), Faculty of Veterinary Medicine, University of Nairobi Kenya from 1993 to 2006. The records of all cases were retrieved from the files through the case lists in the annual catalogues from the archives. The medical files of the dogs with a diagnosis of ehrlichiosis were retrieved. From these, those with confirmed diagnosis of ehrlichiosis were identified. All the medical files were read and scrutinized for details such as breed, age, sex, clinical history, clinical signs, treatment administered and outcome. The total case records were 514. Data were collected from the details available in the record cards for each specific case. The

data recorded for final computation and analysis included breed, sex, clinical signs, treatment and outcome.

RESULTS

There were 54.4% males and 45.4% females among the dogs with ehrlichiosis in the period under review. The German shepherd was overrepresented with 42.6% (204/479) of all the ehrlichia infected dogs seen at the SAC. Cross-breeds were 28.6% (137/479), GSD crosses 4.6% (22/479), Ridgebacks and Rottweilers were both at 4% (19/479). A summary of the dogs seen at the SAC with ehrlichiosis is presented in Table 1. The most common clinical signs in all dogs in this study were lymphadenomegaly (59.3%), congestion of mucous membranes (48.7%), inappetance (43.7%), a pounding heart (28.4%), pale mucous membranes (21.3%), harsh lung sounds (20.4%) and vomiting (19.8%). The clinical signs upon presentation to the clinic are summarized in Table 2.

Dogs were treated with intramuscular injection of imidocarb dipropionate (5 mg/kg) with a repeat after 2 weeks 82.6% (419/507), oral doxycycline (10 mg/kg daily) for 2 weeks 2.8% (14/507), oral tetracycline (22 mg/kg three times a day) for 2 weeks 0.4% (2/507) or a combination of imidocarb dipropionate with either tetracycline or doxycycline 14% (71/507).

Table 1: Dogs presented at the clinic with ehrlichiosis.

Dog breed	Percentage
German Shepherd	42.6 (204/479)
Labrador	1.9 (9/479)
Rottweiler	4 (19/479)
Ridgeback	4 (19/479)
Doberman	2.5 (12/479)
Spitz	1 (5/479)
Cross breeds	28.6 (137/479)
German Shepherd crosses	4.6 (22/479)
Local	0.4 (2/479)
Other breeds (spaniels, terriers, retrievers, dachshunds, collie, etc)	10.4 (50/479)

Table 2: Clinical signs upon presentation of ehrlichia positive dogs

Clinical sign	Percentage
Lethargy	21.2 (70/331)
Weakness	8.3 (35/421)
Inappetance	43.7 (201/460)
Pale mucous membranes	21.3 (97/455)
Congestion of mucous membrane	48.7 (221/454)
Ocular discharge	8 (34/426)
Harsh lungs	20.4 (34/167)
Panting	8.8 (33/331)
Vomiting	19.8 (34/172)
Splenomegaly	14 (64/457)
Lymphadenomegaly	59.3 (267/450)
Tender abdomen	14.9 (68/457)
Diarrhoea	13.3 (62/465)
Haemorrhage	11.7 (60/514)
Hindlimb weakness	3.3 (15/451)
Pounding heart	28.4 (146/514)
Flea allergy dermatitis	2 (9/458)
Dermatitis	3.3 (17/512)
Fleas	4.5 (21/466)
Ticks	6.9 (32/467)

Of the treated animals 49.1% (239/487) improved, 43.5% (212/487) were not presented for follow up and 7.4% (36/487) showed no improvement at all.

DISCUSSION

The males were over represented at 54.4% among the dogs diagnosed with ehrlichia over the period of study which is in agreement with Ndip *et al.* (2005) study in Cameroon which noted that the majority of dogs affected by ehrlichia were males at 63%. This finding is, however, in contrast with the observation by Harrus *et al.* (1997a) that noted no sex predilection in a retrospective study of canine monocytic ehrlichiosis. This over representation by males could be due to bias by the dog owners for males as compared to females based on reproductive behavior. Locally there is a bias for males by security agencies based on reproductive behavior and this may have an influence on the gender of animals being presented for treatment at practice facilities. In this study, the larger proportion of German shepherd dogs with the infection could be due to the fact that this breed has been reported to be more susceptible to ehrlichia and also their higher proportion among the dogs attended at the clinic. The German shepherd dog is a very popular breed in Kenya and this could also be the reason for their overrepresentation among the ehrlichia infected dogs. Over-representation of German shepherd dogs with a concurrent under-representation of cross breeds in canine monocytic ehrlichiosis has been reported (Harrus *et al.*, 1997a). Naturally occurring canine monocytic ehrlichiosis may be manifested by a wide variety of clinical signs (Harrus *et al.*, 1997b). The clinical signs that have been reported for ehrlichia infection include lethargy, anorexia, fever, panting, lymphadenomegaly, splenomegaly, weight loss, pale mucous membranes and bleeding (Harrus *et al.*, 1997a; Neer 1995). The observed clinical signs in our study were lethargy, anorexia, fever, panting, lymphadenomegaly, pale mucous membranes, congestion of mucous membranes, pounding heart, harsh lungs, vomiting, tender abdomen, splenomegaly, ocular discharge, hind limb weakness, dermatitis, diarrhoea and haemorrhage. These signs are non specific and may generally not lead one to make a diagnosis of any specific infection in a dog. This study has revealed that lymphadenomegaly is the most common clinical sign presented in dogs suffering from ehrlichia. This is in agreement with the observation in a study on clinical manifestation of infection by *Anaplasma platys* by Harrus *et al.* (1997c) that on clinical examination lymphadenomegaly was one of that the principal findings. During the acute phase the parasite enters the blood stream and invades the spleen, liver and lymph nodes for replication. The lymphadenomegaly might be due to the multiplication of the parasite in the animal's organs resulting in inflammatory response. Congestion of mucous membranes (48.7%) and inappetance (43%) were also seen in many of the dogs diagnosed with ehrlichiosis making them to be important clinical indicators of this infection. Granick *et al.* (2009) observed that lethargy is one of the clinical signs that may lead one to suspect a dog to be suffering from infection with *Anaplasma phagocytophilum*. In present study lethargy was noted in

21.2% of the cases, the low percentage may be due to the fact that the data did not capture the different genera or species of the infecting organisms. Mazepa *et al.* (2010) have reported lethargy, inappetance and fever to be the most common clinical signs in dogs with *Anaplasma phagocytophilum* infection. In this study, some animals had concomitant infection, Babesia being the most frequent in association with Ehrlichiosis. The association of Ehrlichia with other hematozoa can be attributed to the presence of the common tick vector *Rhipicephalus sanguineus* which is also the transmitter of Babesia organisms. Studies on tick biology indicate that a small percentage of ticks are responsible for harbouring multiple pathogens and successfully transmitting all the pathogens to host (Kaur *et al.* 2011). Occurrence of helminthes in the dogs concurrently with ehrlichia may just be an incidental finding most likely due to lack of control of worms in the dogs. In conclusion, it is noted that because infection by these microbes results to non-specific clinical presentations, practitioners must appreciate the various clinical observations that may be exhibited by dogs infected in order to make a rational decision on the diagnosis and subsequent management. It is observed that congestion of mucous membrane, a clinical sign as noted in study, has limited reference in scientific literature but which seems to be quite important as per the findings of this work.

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