THE SUCCESSES AND CHALLENGES OF COMMUNITY VETERINARY CARE IN JOHANNESBURG'S INFORMAL SETTLEMENTS

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CLAW (community led animal welfare)provides primary healthcare for pets in informal settlements around Soweto and Johannesburg. CLAW has a clinic based on the Durban Deep Mine in Roodepoort and runs daily mobile clinics that provide services ranging from internal and external parasite control, vaccination, sterilisation and 24-hour emergency services. The sick animals that cannot be treated in the field are brought to the clinic for treatment. Before the animals go home they are sterilized and neutered and sent home with a vaccination card that contains all their medical history.

It works closely with community-based organisations, schools, the Department of Agriculture and veterinary services around the city.

Since its start in 1999, CLAW's team of veterinarians and local volunteers have treated, vaccinated, and provided spay and neuter services to sterilize thousands of pets.

I started working for CLAW in 2008 and have since been faced with many challenges, for instance trying to overcome the language barrier, providing education on what the pets need and my other things I will talk about and go into more detail about.

But on the other hand I have also seen many successes in treating the animals and seeing how the owners take better care of their pets and bringing their pets to us for regular check-up and vaccinations.

In my talk I will go into more detail about the challenges we face on a daily basis but also talk about the many successes we see on a daily basis.

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CANINE MONOCYTIC EHRLICHIOSIS

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Canine monocytic ehrlichiosis (CME), caused by the obligate intracellular bacterium *Ehrlichia canis* is an important disease of dogs and other canids worldwide. It is transmitted by the brown dog-tick, *Rhipicephalus sanguineus*, a worldwide distributed tick. Most CME cases occur during the warm season when the vector ticks are abundant. Dog owners living in or traveling to endemic regions should be aware of this disease as it may be fatal. Common clinical signs of CME include depression, lethargy, anorexia, weight loss, lymphadenomegaly, splenomegaly and bleeding (mainly subcutaneous and mucosal petechiae and ecchymoses as well as epistaxis).

The most common hematological sign of CME is thrombocytopenia occurring in more than 90% of infected dogs. The relationship between the degree of thrombocytopenia and infection with *E. canis* in an endemic area was investigated. It has been shown that while only one of 71 (1.4%) non-thrombocytopenic dogs was found positive for *E. canis* DNA (16S rRNA), 13 of 62 (21%) dogs with platelet counts of 100,000-200,000 per *μL*, and 53 of 84 (63.1%) dogs with platelet counts of less than 100,000 per *μL* were found positive. The authors concluded that platelet counts and their magnitude may be a good screening test for CME (Bulla et al., 2004). Pancytopenia is a common hematological finding in dogs suffering from the chronic severe form of the disease. Nineteen dogs with chronic ehrlichiosis exhibiting bicytopenia or pancytopenia (packed cell volume < 36%; white blood cell count < 6.0 x 103/μL; platelet count < 175 x 103/μL) were included in one study. All these animals eventually died, irrespective of the treatment applied indicating the poor prognosis of this disease phase (Mylonakis et al., 2004).

Common Biochemical abnormalities in CME are hypoalbuminaemia, hyperglobulinaemia and hypergammaglobulinaemia. Serum protein electrophoresis reveals a polyclonal gammopathy in most dogs infected with *E. canis*. However,

some dogs may develop monoclonal gamopathy (Harrus et al., 1996). The latter dogs may have high serum protein concentrations and may suffer from hyperviscosity which may lead to subretinal bleeding, retinal detachment and acute blindness (Harrus et al., 1998). The blindness in most of these dogs is irreversible despite intensive anti-rickettsial and anti-inflammatory treatment.

Diagnosis of the disease is challenging due to its different phases and multiple manifestations. The suspicion of CME should be considered when a compatible history (tick infestation, travel to or living in endemic region), typical clinical signs (lymphadenomegaly, splenomegaly, dermal and mucosal petechiae and ecchymoses, epistaxis), typical hematological signs (thrombocytopenia, pancytopenia) and biochemical abnormalities (hypoalbuminaemia, hyperglobulinaemia) are present.

Classical diagnostic techniques (hematology, cytology, serology, isolation) are useful tools in the diagnosis of CME. Demonstration of a typical morula within the cytoplasm of a monocyte in blood smear indicates a monocytotropic ehrlichiosis. Evaluation of blood smears is usually unrewarding as the sensitivity of morulae detection is low. Multiple buffy coat smears have been shown to have a higher sensitivity for detection of *E. canis* morulae (Mylonakis et al., 2003). Blood smears of infected dogs may present reactive monocytes, erythrophagocytosis, platelet phagocytosis and granular lymphocytosis (Harrus and Waner, 2011).

The indirect immunofluorescence antibody (IFA) test is considered the serological “gold standard“ test, indicating exposure to *E. canis*. It is considered as a valuable screening test for CME. The appearance of IgM antibodies after experimental infection was shown to be inconsistent and therefore IgM-serology is not in use. In contrast, IgG titers of 1:40-1:80 or greater are considered positive. Two consecutive IFA tests, 7-14 days apart, are recommended, and a 4-fold increase in antibody titers is suggestive of an active infection. Point of care enzyme linked immunosorbent assay (ELISA) kits for the detection of *E. canis* are also available (the Snap 4Dx® assay by IDEXX Laboratories Inc., USA and the Immunocomb® by Biogal, Israel). They are sensitive and specific and are in common use in clinics.

A definitive diagnosis of *E. canis* infection should be done by polymerase chain reaction (PCR) and sequencing. Polymerase chain reaction and sequencing are sensitive methods for detecting and characterizing *E. canis*-DNA, respectively. Detection of *E. canis* DNA can be achieved as early as 4 to 10 days post-inoculation. Several conventional or real-time PCR assays, based on different target genes, are commonly used (Harrus and Waner, 2011).

Tetracyclines in general and doxycycline in particular are the therapeutic agents of choice for the treatment of CME. Doxycycline should be administered at a dose of 5mg/kg q12 hrs (or 10mg/kg q24 hrs) for the duration of 3 weeks for dogs at the acute phase. Dogs in the subclinical phase may require prolonged treatment. One study suggests that some dogs may require prolonged treatment courses (McClure, et al, 2010). In cases of immune mediated complications, glucocorticosteroids may be indicated.

The prognosis of the acute and the subclinical phases of the disease is good, however grave for the chronic phase. Dogs in the latter phase will eventually die due to bone marrow hypoplasia and its outcomes: peripheral pancytopenia, sepsis and/or bleeding. In a retrospective study investigating prognostic indicators for survival or death in CME, pronounced pancytopenia (WBC < 4 x 10^3/μL; HCT < 25%; PLT < 50 x 10^3/μL) was found as a risk factor for mortality. In this study, severe leucopenia (WBC < 0.93 x 10^3/μL), severe anemia (PCV < 11.5%), prolonged activated partial thromboplastin time (APTT > 18.25s) and hypokalemia (K<3.65 mmol/L) were each found to predict mortality with a probability of 100%. In contrast, WBC counts above 5.18 x 10^3/μL, platelet counts above 89.5 x 10^3/μL, PCV > 33.5%, APTT < 14.5s and serum potassium concentration above 4.75 mmol/L, each provided 100% prediction for survival. These prognostic indicators can be easily obtained at presentation, are inexpensive, and may be useful aids when treatment and prognosis are being considered (Shipov et al., 2008). To date, there is no commercial vaccine and tick control is the most effective preventive measure.

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FELINE HAEMOPLASMOSIS AND BARTONELLOSIS

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Feline haemoplasmosis or haemotropic mycoplasmosis, previously known as feline haemobartonellosis or feline infectious Anemia (FIA) is a worldwide important disease which may be fatal. Feline bartonellosis, on the other hand, is caused by one of several *Bartonella* species and is not associated with clinical disease in most cases. Due to the historical closely related name of the former (haemobartonellosis), the 2 disease groups were frequently erroneously interchanged. It should be noted that haemoplasmoses and bartoneloses are two different disease groups. This presentation will overview the two different diseases.

Feline haemoplasmoses are caused by small Gram-negative bacteria parasitizing erythrocytes, residing on their surface. The haemoplasmoses were reclassified in recent years as *Mycoplasma* species. Three *Mycoplasma* species affecting cats have been documented to date: *Mycoplasma haemofelis, Candidatus* Mycoplasma haemominutum and *Candidatus* Mycoplasma turicensis. The route of transmission of the haemoplasmas has not yet been determined. However, experimental transmission via oral or parenteral administration of infected blood has been demonstrated (Barker and Tasker, 2013). They may cause severe hemolytic anemia and death in affected cats. Parasitemia is usually cyclic and severity of anemia is correlated with the infecting bacterial load. High percentages of the feline populations worldwide are infected and a significant number of cats are asympthomatic carriers (Barker and Tasker, 2013).

Mycoplasma haemofelis is considered pathogenic, and typical clinical signs include tachypnea, lethargy, depression, anorexia, pale mucous membranes, icterus, emaciation, dehydration, splenomegaly, fever, decreased body temperature and tachycardia. Regenerative anemia is a typical hematological finding. Some cats may be co-infected with retroviruses such as