Canine haemoplasmas

Canine Haemoplasmosis

Haemoplasmas are small bacteria that parasitise the surface of red blood cells and can, under certain circumstances, trigger haemolytic anaemia (i.e. haemoplasmosis). The first haemoplasma described in dogs, formerly referred to as *Haemobartonella canis,* was renamed *Mycoplasma haemocanis* following DNA sequencing analysis that showed it was closer to other mycoplasmas than the ricketssial-type organisms that it was previously grouped with. In the early '00s another haemoplasma, '*Candidatus* Mycoplasma haematoparvum', was also described in dogs. Both *M. haemocanis* and *'Candidatus* M. haematoparvum' appear to only lead to haemolytic anaemia in splenectomised or immunocompromised dogs.

FAQs

What are the clinical signs?

Many of the clinical signs of haemoplasmosis (lethargy, weakness, collapse, depression, pallor, tachycardia, dyspnoea, hepatosplenomegaly, lymphadenopathy, dehydration, pyrexia, weight loss, pica, icterus) are due to anaemia or systemic inflammation.

There are no recent studies on the pathogenicity of canine haemoplasmas. Infection usually only results in haemolytic anaemia in splenectomised or immunocompromised dogs - i.e. typically those receiving chemotherapy, often in conjunction with splenectomy for a cancerous process. Subclinical, latent Infection is presumed to be reactivated following splenectomy or a novel infection is acquired at time of splenectomy (e.g. via the administration of blood products), leading to clinical disease.

Although case reports have been published of haemoplasma infection being associated with anaemia in dogs, an association between anaemia and infection has not been found in the limited epidemiological studies done to date – likely due to the large numbers of subclinical infections. We know that subclinical 'carrier' dogs infected with canine haemoplasma exist, similar to the situation seen in cats with feline haemoplasma infection, so it is important that quantitative (q) PCR test results for canine haemoplasmas are interpreted in conjunction with clinical history and haematological results.

What is the prevalence?

Only limited work has evaluated the prevalence of haemoplasma infection in different dog populations. Studies from Southern France, Switzerland, and South Africa found *M. haemocanis* infection in 0.9 to 9% of dogs, while '*Candidatus* M. haematoparvum' was found in 0.3 to 33% of dogs. A study in the USA found that kennelled dogs had a much higher prevalence of *M. haemocanis* infection than pet dogs.

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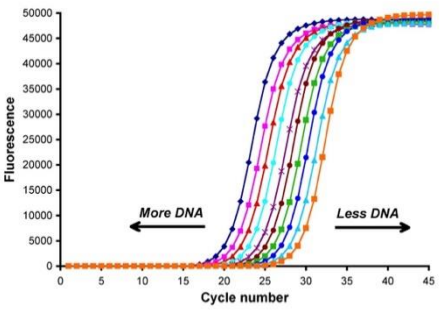
The prevalence of both *M. haemocanis* and '*Candidatus* M. haematoparvum' in dogs from the UK is considered to be very low (DOI: 10.1111/j.1748-5827.2010.00987.x.); however, infection and clinical disease associated with both of these agents have been reported in the UK so they should not be ignored.

How is canine haemoplasma infection diagnosed?

PCR is the ONLY reliable way to diagnose haemoplasma infection!

The Molecular Diagnostic Unit can perform qPCR tests for the detection and quantification of both *M. haemocanis* and '*Candidatus* M. haematoparvum' in blood. These tests are of most use: 1) in the evaluation of dogs with haemolytic anaemia, particularly those that are immunocompromised or splenectomised; and 2) in the screening of potential blood donors prior to use.



What samples are required for submission?

The sample required for the canine haemoplasma qPCR test (both *M. haemocanis* and '*Candidatus* M. haematoparvum') is 0.5ml EDTA-anticoagulated whole blood (plasma / serum is not a suitable alternative). Each haemoplasma assay includes an internal amplification control to ensure that a valid diagnostic result is produced for every submitted sample.

How is canine haemoplasmosis treated?

In dogs with clinical haemoplasmosis, the treatment of choice is doxycycline 10mg/kg once daily. A second-line drug would be a member of the fluoroquinolone class (e.g. enrofloxacin or marbofloxacin). An extended course (4 weeks+) is likely required, as these dogs are likely immunocompromised. Care must be taken to follow doxycycline with food or water to prevent oesophagitis as a result of the medication lodging in the oesophagus, as some preparations cause oesophageal ulceration. The qPCR can be used to evaluate response to treatment, and should be considered prior to discontinuation of treatment. No drug regimens have been evaluated for the clearance of infection from dogs.

Some dogs (i.e. those that are very anaemic) also require blood transfusions.

Since ticks, and possibly fleas, have been implicated in the transmission of haemoplasmas, we recommend that dogs infected with haemoplasmas are given regular ectoparasite control. Positive dogs should also not be used as blood donors.

Updated December 2021 by Dr Emi Barker