

Anaplasma phagocytophilum

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Anaplasma phagocytophilum is a rickettsial intracellular bacteria that infects primarily neutrophils. It is transmitted by the tick *Ixodes ricinus*, found in the UK and throughout Europe. A recent survey found that 0.74% of ticks in the UK were *A. phagocytophilum* infected. Transmission from the tick to the host occurs about 36 to 48 hours after the tick starts feeding.



FAQs

What clinical signs are seen with *A. phagocytophilum* infection?

Infection is often mild, or subclinical, but occasionally more severe signs are seen. Signs usually occur around two weeks after the tick bite. Associated with acute febrile illness in dogs. Other clinical signs can include lethargy, anorexia, polyarthritis (pain and swelling in multiple joints; sometimes shifting from one leg to another), neck pain, pallor, lymphadenopathy, and splenomegaly.

What clinical pathology changes occur with *A. phagocytophilum* infection?

Thrombocytopenia is common (90% of cases). A non-regenerative anaemia and leucopenia may also occur. Serum biochemistry may reveal increased liver enzyme activity, hyperglobulinaemia, and hypoalbuminaemia.

Can blood smears diagnose *A. phagocytophilum* infection?

Yes, *A. phagocytophilum* morulae may be visible in the neutrophils (and occasionally eosinophils) on blood smear examination but the sensitivity of this technique is poor. A buffy coat smear may improve sensitivity.

Is PCR useful for the diagnosis of *A. phagocytophilum* infection?

Yes. PCR is very sensitive and specific and can be done on blood samples (although lymph node and splenic aspirates, joint tap fluid as well as bone marrow aspirates can also be used). The Acarus Laboratories of the Molecular Diagnostic Unit have two PCR assays that can amplify *A. phagocytophilum*: (i) a specific *A. phagocytophilum* qPCR that quantifies any infection with this species in the sample analysed; this may be indicated more in untravelled dogs that have resided in the UK only, (ii) a generic *Ehrlichia/Anaplasma* spp. PCR amplifies all *Anaplasma* and *Ehrlichia*

Reception Hours

Mon-Fri 9am - 5pm

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species, followed by identification of the infecting species by sequencing. The generic assay is indicated in dogs that have travelled or that have been imported in which other species are possible differential diagnoses.

Is serology useful to diagnose *A. phagocytophilum* infection?

It can be. An antibody response to *A. phagocytophilum* infection occurs around eight days after infection and a four-fold rise in titre is required to differentiate acute from chronic infection, as antibody levels can remain high for months. A negative antibody titre can be useful to rule out *A. phagocytophilum* infection as long as the dog has not been sampled too early in infection (within a week). The IDEXX SNAP 4Dx test detects antibodies for *Anaplasma phagocytophilum* and *Anaplasma platys* due to cross-reactivity between these species. *Anaplasma platys* infection causes canine cyclic thrombocytopenia and is not present endemically in the UK. Thus, a positive IDEXX SNAP 4Dx test for these antibodies in an untravelled UK dog is likely to represent seropositivity for *A. phagocytophilum*, and may need to be followed up with a quantitative antibody test for Anasplasma species.

How do I treat *A. phagocytophilum* infection?

Doxycycline (10 mg/kg orally once daily) is the treatment of choice for *A. phagocytophilum*-associated disease. The optimum treatment duration is not known but two weeks of doxycycline treatment is usually sufficient. Most dogs improve within 24-48 hours of starting treatment. Supportive care, e.g. intravenous fluid therapy, may be required for some dogs. Repeat PCR testing can be performed following treatment although it is not known if a negative (undetected) result should be expected in this situation.

How do I prevent *A. phagocytophilum* infection?

Effective tick control. Owners should be instructed to avoid tick exposure whenever possible, remove any ticks found on a dog promptly and use a topical ectoparasiticide that is effective against ticks.

Is *A. phagocytophilum* zoonotic?

Humans can be infected with *A. phagocytophilum*, and can develop a flu-like disease (human granulocytic anaplasmosis). Transmission does not occur directly from dogs to humans, but dogs can act as sentinels for human exposure via the mechanical carriage of infected ticks.

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What about cats?

Anaplasma phagocytophilum has been reported in cats very occasionally, and can cause fever, lethargy, tachypnoea, swollen joints or be asymptomatic. Thrombocytopenia is not consistently found. PCR can be used for diagnosis and a two-week course of doxycycline is effective treatment (doxycycline treatment should always be followed by food and/or water to ensure complete swallowing into the stomach otherwise oesophageal damage/irritation can result). NB: the IDEXX SNAP 4Dx test is optimised for canine antibodies, not feline antibodies, so this test is not validated for use in cats. However, some researchers have successfully used it to detect cat antibodies against *Anaplasma* spp. (DOI: 10.1177/2055116917753804)



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