

## **Babesiosis**

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- There are at least 8 genetically unique *Babesia* species or subspecies that can infect dogs and two in cats including; *Babesia canis canis*, *B. c. vogeli*, *B. c. rossi*, *B. gibsoni*, *B. conradae*, *Theileria annae*, *B. felis* (Feline), *B. canis presentii* (Feline) and several unnamed yet genetically unique *Babesia* spp. This may affect test interpretation because most laboratories only test for 2 canine species and cross reactivity is not always present. Knowledge of which species are tested for is important for both antibody and DNA testing.

## **Risk factors**

- Breed
  - American Pit Bull Terriers: *Babesia gibsoni*
  - Greyhounds: *Babesia canis vogeli*
- History of tick attachment
- Splenectomized animals develop more severe clinical disease.
- Immune suppression may cause clinical signs and increased parasitemia in chronically infected dogs.
- History of a recent dog-bite wound is a risk for *B. gibsoni* (Asia) infection.
- Recent blood transfusion from a subclinically infected donor.

## **Disease (one or more of the following are good reasons to test)**

- Anemia (typically regenerative)
- Thrombocytopenia (more common than anemia in some studies and can occur without anemia)
- Hyperglobulinemia
- Splenomegaly
- Icterus
- Pigmenturia
- Screening of blood donors
- Screening of breeding animals
- Normal? Some recovered animals have not detectable abnormalities yet remain persistently infected

## **Testing**

- Polymerase chain reaction (PCR): Amplification of a specific piece of DNA from the organism of interest. Since *Babesia* lives in red blood cells, EDTA anticoagulated whole blood is the sample of choice for *Babesia* PCR testing. Obtain samples BEFORE treatment, since treatment may reduce number of organisms and result in false negative test results. The PCR test used by the VBDDL can detect parasitemias of 0.00000073% or about 1300 fold fewer organisms than microscopy.
- Indirect fluorescent antibody (IFA): Detection of antibodies against the organism of interest. Serum is the typical sample tested for antibodies.
- Light microscopy: Detection of *Babesia* organisms in red blood cells. Parasitemia of infected animals can range from 0.0001% to >10% of the red blood cells. Thin stained peripheral blood smears are the typical sample tested. Smears made from capillary blood (ear or toenail) may improve organism recovery.

## Treatment

- Imidocarb dipropionate (FDA approved; 6.6 mg/kg SC or IM every 1–2 weeks) and diminazine aceturate (not FDA approved; 3.5–7 mg/kg SC or IM every 1–2 weeks) decrease morbidity and mortality in affected animals. This may completely clear *B. canis* infections but not *B. gibsoni*.
- Combination therapy of azithromycin (10 mg/kg PO q24h for 10 days) and atovaquone (13.5 mg/kg PO t.i.d for 10 days) is the treatment of choice and the only treatment that can potentially clear *B. gibsoni* (Asia) infections in dogs. In a controlled study 85% of dogs cleared the infection after treatment.
- Metronidazole (25–50 mg/kg PO q24h for 7 days), clindamycin (12.5–25 mg/kg PO b.i.d. for 7–10 days), and doxycycline (10 mg/kg PO b.i.d. for 7–10 days) have been reported to decrease clinical signs but not to clear infections.
- Primaquine phosphate (1 mg/kg IM, single injection) is the treatment of choice for *B. felis*.