

Babesia

Babesia is a tick-borne blood parasitic infection in dogs. It was previously considered uncommon in the United States, but more infections have been diagnosed in the last two decades. *Babesia canis* and *Babesia Gibsoni* are the two most common species diagnosed in dogs. There is a predilection for the development of Babesia in pit bull terriers and Greyhounds, and these breeds are more commonly diagnosed than others.

Cause

Infection with Babesia happens after a tick carrying Babesia organisms bites a dog. The Babesia organism is in the tick's saliva; in order to transmit the parasite, the tick must be on the dog for two to three days. Babesia organisms from the tick's mouth enter the dog's bloodstream and attach to red blood cells. Transmission of Babesia infection can be passed from an infected female dog to her unborn puppies, or when an infected dog bites another dog and breaks the skin. Ticks that feed on dogs with active Babesia infection and then move to other dogs can pass the infection to additional dogs, which is why sometimes whole colonies of dogs can become infected.

Clinical Signs

In the early phase of the disease, red blood cells with the Babesia organism in them are recognized as abnormal by the patient's immune system and taken out of circulation. As the disease progresses, more and more red cells are destroyed and the patient becomes anemic. In some patients, the immune system reaction becomes overzealous and begins destroying normal, non-infected red cells as well, a condition called immune-mediated hemolytic anemia. Symptoms include weakness, collapse, jaundice (yellow color to gums, skin, and eyes), fever, and red or orange-colored urine.

Babesia infection can cause inflammation in other cells and organs as well. Sometimes platelet counts decrease as well and the patient develops clotting problems. This complication is more commonly seen in patients infected with *Babesia Gibsoni*. Rarely, central nervous system complications such as seizures, confusion, and loss of neurologic function occur. Difficulty breathing has been seen in severe infections as well. Because ticks carrying Babesia organisms are often carrying other infectious organisms as well, patients may be co-infected with other blood parasites that cause additional signs of illness.

Diagnosis

Babesia and other tick-borne infections are often suspected in patients that present for anemia or other abnormal cell counts. Screening tests for a variety of tick-borne infections are generally done as a part of the workup for anemia. While waiting for these tests to return, antibiotics for the most common tick-borne infections are generally started. Babesia organisms can sometimes be seen when an experienced clinical pathologist reviews the blood smear. Because of the breed predilection in pit bull terriers, any sign of anemia often prompts additional specialized testing for this infection. Blood tests looking for the organism's DNA (called PCR testing) are generally submitted.

Additional tests that are often recommended in severely anemic patients are serum chemistry profiles, urinalysis, and imaging studies (X-rays and ultrasound). These are done to evaluate for the possibility of other organ damage due to anemia as well as to look for tumors or other causes of blood loss. Patients with Babesia and other infectious causes of anemia will often have an enlarged liver or spleen. In some cases, sampling one of these organs via ultrasound guidance helps to identify the organism. Additionally, evaluation of the patient's bone marrow can sometimes reveal the diagnosis. These tests can be particularly important for patients with potential Babesia infection, as the organism does not respond to routine antibiotics. These tests will be recommended if the patient has a breed predilection (Pit Bull or Pit Bull crossbreeds), lives in a colony of dogs, or is not responding well to standard therapy for anemia. Finally, if Babesia infection is confirmed, specialized tests are likely to be recommended to identify the species of Babesia organism involved, as therapeutic recommendations differ depending on species.

Therapy

Babesia infections can be difficult to treat and resolve, particularly with some of the more refractory species. Studies are ongoing to improve options for therapy as this disease gains prevalence in the United States. Early therapy for Babesia is aimed at management of the potentially life-threatening anemia and includes fluid therapy, transfusions, and other supportive care. In anemic patients, broad-spectrum antibiotics are generally started immediately against the more common tick-borne infections, but Babesia is often resistant to these therapies.

Babesia-infected patients with low-grade anemia are not always started on therapy because of medication costs and side effects. Some infected patients can be controlled and managed with antibiotic medications for months or years, but never cleared of the infectious organism. Not all possible therapies are available in the United States. Because Babesia is a very challenging disease to treat and can be transmitted to other dogs, it is particularly important to work diligently to prevent spread.

Currently, most patients with the most common forms of Babesia are treated with a combination of oral and occasionally injectable antibiotics/antiprotozoals. Medications have some potential side effects, so administration precautions should be discussed and recommendations followed closely.

Prognosis

Babesia is a potentially life-threatening disease, but many patients are successfully cleared of infection with appropriate therapy and follow up. The early phase of the disease, in which the patient is severely anemic, is particularly dangerous. Patients that have had their spleen removed prior to infection are harder to clear of the organism as the spleen plays a role in the removal of the organism from the body.

Long Term Follow-Up

Patients with Babesia infection generally require frequent monitoring with an internal medicine specialist due to the tenacity of the infection, the possibility of relapse and side effects of medications. Follow-up visits generally involve blood tests and assessment of patient progress. Because therapeutic recommendations are based on exam findings as well as lab tests, we request that the follow-up testing be done in person at Veterinary Specialty Center, as it is not possible for our internists to assess patients over the phone. Many patients are eventually cleared of infection and the need for follow up is significantly reduced.