



ANTECH
D I A G N O S T I C S

News

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BARTONELLOSIS

Bartonella spp. are becoming recognized as widespread organisms in many species of animals. For example, 98% of deer killed on roads in the northwest, 93% of mule deer in the east, and 89% of beef cattle and 17% of dairy cattle in Oregon carry *Bartonella* spp. Each animal species can be infected with a different one of 12 species of Bartonella. Species of Bartonella that have been shown to infect cats include *B. henselae*, *B. clarridgeiae*, and *B. koehlerae*. Most cases of Cat Scratch Disease in people are caused by *B. henselae*. In dogs, *B. vinsonii* is the most commonly reported *Bartonella* species, although *B. henselae* also is seen.

Bartonella spp. are not free-living organisms and require a reservoir host. Transmission from reservoir hosts is via arthropod vectors (body lice, sandfleas, ticks, fleas). *Bartonella* spp. are carried in red blood cells but only ~ 3% of these blood cells are typically infected.

Endothelial cell proliferation of the organism causes lesions. Cat Scratch Disease is the most common zoonotic disease, and affects children and adults with equal frequency. Immunocompromised people are also at risk for more serious complications of Bartonella infections including bacillary angiomatosis, bacillary peliosis hepatitis, and fever with bacteremia.

CLINICAL SYNDROMES

Cats. There is a high prevalence of Bartonella infection in cats, which are usually asymptomatic carriers of the

organism. Prevalence varies geographically, but the organism prefers high heat and humidity, and the presence of arthropod vectors (e.g., New Jersey, ~ 25%; southeast, Georgia, Florida, ~ 40%; west coast, California, Oregon, ~ 45%; high Rockies, ~ 10%; desert, ~ 8%.) Infections in cats can persist for years.

Bartonella has been reported as a possible cause of uveitis, and stomatitis and lymphadenitis in FIV-infected cats. It may also be responsible for some chronic insidious diseases for which we presently don't know the etiology. Transient fever, mild anemia, eosinophilia, neurological signs, (vestibular disease, staring into space), and cataracts were reported in cats experimentally infected with *B. henselae* or *clarridgeiae*. Necropsy findings in these cats revealed lymphocytic cholangitis, lymphocytic hepatitis, splenic lymphoid hyperplasia, and lymphoplasmacytic myocarditis. In catteries, Bartonella infections may cause decreased reproductive efficiency in females.

Dogs. Although of low prevalence, *B. vinsonii* has been documented as a cause of endocarditis in 4 dogs. A closely related organism is suspected to cause myocarditis and endocarditis in North Carolina where Bartonella seroprevalence is low (3-4% of dogs). *Bartonella* spp. may also cause unexplained epistaxis, idiopathic arthritis, granulomatous lymphadenitis and rhinitis in dogs.

BARTONELLOSIS (cont'd.)

DIAGNOSIS

There is still much to be learned about diagnosing Bartonella infections. Serology may be the most sensitive method of detecting exposure to Bartonella spp. In general, a strong positive antibody titer in a cat indicates the presence of Bartonella. Antibody titers persist in the presence of chronic infection. The organism can be cultured from the blood in 80% of cats with mid to high antibody titers. Some false negative serology tests occur especially if the cat is also FIV infected.

Antibodies developed by cats against Bartonella spp. are cross-reactive against other Bartonella spp. Hence, serological testing with use of B. henselae as the test antigen will detect presence of antibodies not only against B. henselae, but also against B. clarridgeiae and possibly other Bartonella organisms some of which may not be pathogenic.

The age to begin to test cats is after maternal antibody has waned (believed to be > 6 months old). Bartonella spp. are not transmitted in utero and cannot be transferred by direct contact.

As Bartonella organisms can be transmitted by transfusion, all blood donor cats should be tested for Bartonella infection. However, at this point, screening all healthy cats appears unwarranted. For households where there are immunosuppressed people, it would be important to screen their cats.

Bartonella spp. can also be detected with blood culture or PCR testing. The sensitivity of these techniques for documenting the infection may be relatively poor due to the low numbers of organisms in the blood.

TREATMENT

Doxycycline (50 mg q. 12 hrs for 42 days) has been reported to be effective in clearing Bartonella bacteremia in 5/7 naturally infected cats for > 1 year. However, in 2/7 cats, the organism was isolated again after 1 year. In 3 of the 5 cats where treatment was successful, antibody titers declined 4 to 8-fold at 6 weeks post-treatment. In the 2 cats failing treatment, there was no decline in antibody titer. Another investigator reported difficulty clearing bacteremia with doxycycline in experimentally infected cats.

Azithromycin (5 mg/kg q. 24 hrs for 14 days) may be an effective treatment in cats. Other macrolides, such as erythromycin, also may be effective. In people, aminoglycosides and penicillin have been used together because of their synergistic effects.

BARTONELLA SEROLOGY WESTERN BLOT

Test Code #16890
Specimen
Requirements . . . Serum (0.50 ml)
Turnaround
Time 2 - 3 days

BARTONELLA PCR

Test Code #1315
Specimen
Requirements Whole Blood
(1 LTT; at least 1 ml)
Turnaround
Time 2 - 3 days

BARTONELLA CULTURE

Test Code #16001
Specimen
Requirements Whole Blood
(1 LTT; at least 1 ml)
Turnaround
Time 2 - 4 weeks

EHRlichiosis UPDATE

DIAGNOSIS IN DOGS

As many Ehrlichia spp. infect dogs, serologic testing can be nonspecific and may not be clinically relevant.

The E. canis genogroup consists of E. canis, E. chaffeensis, and E. ewingii. Exposure to any of these organisms will result in E. canis seropositivity. Low antibody titers (< 1:160) may not necessarily indicate infection, as 50% of dogs with low titers are reported to be negative on Western blot testing for E. canis and E. chaffeensis. Thus, low titers need to be interpreted cautiously.

E. platys has been associated with cyclic thrombocytopenia in dogs, but not with other clinical illness. In contrast, E. equi is becoming more common as a cause of canine granulocytic ehrlichiosis in areas where Ixodes spp. ticks are more prevalent. E. risticii has also been shown to infect dogs.

PERSISTENCE OF E. CANIS TITERS

Some asymptomatic dogs have persistent E. canis serologic titers for more than 9 months after treatment. In the majority of these cases, however, the PCR technique has been unable to detect ehrlichial DNA.

For these dogs with persistent titers, recommendations are to perform PCR: if positive, retreat the dog with another 2-3 week course of doxycycline. If negative, monitor the titer periodically and redo PCR if it fails to decline. Some of these dogs may maintain high titers because of re-exposure, but remain asymptomatic because they are immune.

About 30% of dogs exposed to Ehrlichia spp. have positive serologic titers to Bartonella spp. Consider Bartonella infection in dogs with persistent illness not responding completely to treatment for E. canis. In these cases, Bartonella may be spreading by the brown dog tick, Rhipicephalus sanguineus.

We thank Drs. William Hardy and Ed Breitschwerdt for contributing the latest information on these important topics.