



NATIONAL VETERINARY LABORATORY

P.O. Box 239, 1Tice Road
Franklin Lakes, NJ 07417
877-NVL-LABS (877-685-5227)
www.natvetlab.com

NEWSLETTER

Recent *Bartonella* Publications[©]

Evelyn E. Zuckerman, Editor

Winter 2008

Vol. 7, Number 1

In This Issue:

In the winter 2008 issue of the NVL Newsletter we will review important recent animal and human *Bartonella* publications. There are 1,835 *Bartonella* scientific articles at the time of this writing including several articles, describing psychotic and fatal neurological complications.

Bartonella in Animals:



Kangaroos:

Kangaroos and prairie dogs are the most recent animals to join the growing list of animals that are chronic carriers of *Bartonella*. There are presently more than 20 *Bartonella* species distributed among: humans, cats, cougars, dogs, foxes, wolves, horses, cattle, sheep, squirrels, voles, mice, rats, rabbits, guinea pigs, raccoons, bats, sea turtles, and porpoises. Arthropod vectors that transmit *Bartonella* among and between animals are: fleas, ticks, keds, biting flies, sand flies, and lice. Although *Bartonella* has not yet been found in mosquitoes, it seems probable that they will also be added to the list of *Bartonella* vectors in the future.

***Bartonella australis* sp. Nov. from Kangaroos, Australia.** Fournier, P-E., Taylor, C., Barrassi, L., Smith, G., and Raoult, D. *Emerging Inf Dis*, 13:1961, 2007.

Only 2 *Bartonella* species, *B. henselae* and *B. quintana*, had been found in Australia until this discovery. Three *Bartonella* isolates were cultured from the blood of 5 *Macropus giganteus* grey kangaroos from central coastal Queensland, Australia. This is the first *Bartonella* isolated from kangaroos or from any marsupial. The new *Bartonella* species is related more closely to *B. elizabethae* and *B. tribocorum* which are often

found in rodents. It will be interesting to determine if any *Bartonella* diseases are found in people who handle or care for kangaroos.



Eastern grey kangaroo

Prairie Dogs:

Temporal and Spatial Patterns of *Bartonella* Infection in Black-tailed Prairie Dogs (*Cynomys ludovicianus*). Bai, Y., Kosoy, M.Y., Ray, C., Brinkerhoff, R.J., and Collinge, S.K. *Microb. Ecol.* 56:373, 2008

Bartonella were cultured from 20 black-tailed prairie dog colonies in Boulder County, CO from 2003-2005. *Bartonella* were found in all colonies and the overall prevalence was 23.1% but varied from 4.8% to 42.5% in various colonies. The prevalence in prairie dogs was lower than in other rodent species. The public health significance of *Bartonella* in prairie dogs remains to be elucidated.



Prairie dog colony

Bartonella in Humans:

Almost all human publications concerning cat scratch disease (bartonellosis) begin with the following general statement "Cat scratch disease is typically a self-limiting illness which does not require antibiotic therapy." Although this is true for ~80% of CSD cases, more severe sequelae are being reported each year. *Bartonella* infections of humans are not "usually self-limiting" as the following publications will demonstrate. Both neurological and cardiovascular effects of *Bartonella* infection can be life-threatening.

A Case of Fatal Disseminated *Bartonella henselae* Infection (Cat Scratch Disease) with Encephalitis. Fouch, B., and Coventry, S. *Arch Pathol Lab Med*, 131: 1591, 2007.

A 6-year-old, previously healthy, Hispanic boy presented with left axillary lymphadenopathy. He had exposure to a dog and cat, but not to kittens. Cephalexin and ibuprofen therapy were instituted for presumed CSD. He quickly developed fever, vomiting, and abdominal pain followed by severe headaches and several seizures. His condition continued to deteriorate by hospital day 4 with mental status changes, seizures and finally respiratory arrest. Blood cultures were sterile and head computed tomography revealed diffuse cerebral edema with effacement of basilar cisterns. The patient died and the family gave permission for an autopsy.

The axillary lymph node was negative for *Bartonella* organisms by special stain but was positive by PCR assay. Examination of the brain was negative by PCR and for *Bartonella* organisms. Extensive evaluation for other infectious etiologies was also negative. The brain had inflammatory infiltrates, perivascular cuffing and small microglial nodules. There was evidence of widespread necrotizing granulomas in the spleen. Serology for *B. henselae*, IgG 1:128 and IgM <1:16, was interpreted as "equivocal." **Editor's Note: These serologic data are interpreted by some laboratories as positive. The lack of IgM but 1:128 IgG titer indicates chronicity even though, after antibiotic therapy, the patient presented with acute illness and died within 4 days.**

Bivalvular *Bartonella henselae* Prosthetic Valve Endocarditis. Vikram, H., Bacani, A.K., DeValeria, P., Cunningham, S.A., & Cockerill, F.R., III. *J Clin Micro*, 45:4081-4084, 2007.

This is a case report of a life-threatening *Bartonella henselae* endocarditis involving prosthetic mitral and aortic valves. A 43-year-old male was diagnosed with culture-negative endocarditis of the mitral and aortic valves in 1999. He was given an aortic homograft and porcine mitral valve followed by 6 weeks of antimicrobial therapy. An etiology for the endocarditis was never established and he remained in good health after the surgery until 2005. In August 2005 he developed severe fatigue and intermittent fevers. Blood cultures were sterile. By November 2005 he progressed to increasing fatigue, persistent fevers and crescentic glomerulonephritis- acute renal

insufficiency. *Bartonella* serology was not performed. One month later, thickened leaflets and vegetations were noted on the aortic and mitral valves. *Bartonella* serology was then performed and the results were *B. henselae* IgG 1:1,024, *B. quintana* IgG 1:16,384 and, corresponding IgM titers were negative (<1:20). The patient then reported acquiring a kitten 6 months prior to the onset of his symptoms and having been scratched and bitten on a regular basis. He did not recall seeing fleas on the kitten. At surgery the aortic homograft leaflets were found to be destroyed and the porcine mitral valve had multiple vegetations. The damaged valves were replaced with St. Jude mechanical valves and PCR analysis demonstrated *Bartonella henselae* in the vegetations.

Postoperatively the patient was treated with a regime of gentamicin, doxycycline, vancomycin, and ceftriaxone. Gentamicin was given for 2 weeks and he remained on doxycycline for 1 year. He was advised to avoid contact with cats and remains well 18 months after surgery. A review of the literature found a total of 6 other cases of *Bartonella* prosthetic valve endocarditis. The 3 cases that had valve replacement surgery survived, whereas 2 of the 3 patients who did not have valve replacement surgery died. This case demonstrates the importance of considering infectious endocarditis (including *Bartonella*) in the differential diagnosis of glomerulonephritis despite the sterile blood cultures.

Editor's Note: This case highlights the necessity for veterinarians to alert their immunosuppressed clients- heart valve replacement patients, cancer therapy patients, organ transplant patients and HIV-infected people to the potential risk of *Bartonella* from cats. Veterinarians should counsel their immunosuppressed clients to have their cats tested and to avoid contact with cats whose *Bartonella* status is unknown.

Stroke as a Manifestation of Acute *Bartonella henselae* Endocarditis. Schneer, S., Marcovicu, D., Beilin, V., Goffman, M., and Dicker, D. Harefuah, 146:902, 2007.

A 37-year-old male was hospitalized due to low grade fever and weakness. He was diagnosed with infective endocarditis caused by *B. henselae*. His mitral valve was severely damaged and he experienced a cerebrovascular event (stroke) caused by septic emboli. The patient had severe neurological damage due to his stroke and his mitral valve was replaced. The authors conclude that "there should be a high index of suspicion for the presence of this pathogen (*B. henselae*) in cases presenting with signs of infection associated embolic events."

Editor's Note: Dr. Charla Jones, Veterinary Cardiology and Medicine Service, Austin, TX, has treated many *Bartonella* infected cats, and a few dogs, with heart valve disease, cardiomyopathy and aortic thrombi which are analogous to the previous report and this case.

***Bartonella tamiae* sp. Nov., a Newly Recognized Pathogen Isolated from Three Human Patients from Thailand. Kosoy, M., et al., J Clin Micro, 46:772-775, 2008.**

Three strains of a novel *Bartonella* species (*B. tamiae*) were cultured from human patients in

Thailand. The human disease spectrum and animal host reservoir(s) are unknown.

Do *Bartonella* Infections Cause Agitation, Panic Disorder, and Treatment-Resistant Depression? Schaller, J.L., Burkland, G.A., and Langhoff, P.J. MedGenMed, 9:54, 2007.

This report is a very important observation of the unrecognized psychiatric and depressive illnesses caused by *Bartonella*. Three patients developed acute onset personality changes, agitation, depression, and panic attacks. Initial *Bartonella* clinical signs of CSD- skin papules, regional lymphadenopathy, fever, and an angiomatosis rash were not recognized as indicating *Bartonella* infections. After unsuccessful psychiatric therapy, these patients were tested for *Bartonella* infections. **Case 1:** A 41-year-old minister underwent dramatic personality changes after returning from a camping trip to North Carolina where he had removed 3 *Ixodes* deer ticks from his leg and shoulder. Five weeks later he complained of fever and painful lymphadenopathy of his right axillary lymph node. He tested negative for the Lyme disease agent at the CDC but was serologically positive for *B. henselae* (IgG 1:256). He developed serious agitation, panic attacks, and major depression and was diagnosed by his psychiatrist as having bipolar disorder. High doses of psychotic drugs and antidepressants had minimal effect and the patient had episodes of throwing objects during periods of agitation. After consulting an infectious disease physician he was treated with azithromycin and rifampin for 8 weeks. Finally, when his lymphadenopathy resolved, his psychiatric and aggression signs returned to normal.

Case 2: A medical student presented with an "unusual rash" on her thighs, measuring 2-4 by 1/2 inches which was diagnosed by a dermatologist as angiomatosis. Cushing's syndrome, Kaposi's sarcoma and HIV infection were ruled out as the cause. She complained of panic attacks, profound restlessness, depression, and information processing limitations that began around the time of the appearance of her rash. Treatment with psychotic drugs and antidepressants had minimal effect. She had major risk factors for *Bartonella* infection including recent adoption of kittens from a shelter, numerous flea bites, and allowing the kittens to sleep in her bed. She explained that her cats routinely licked her hands, mouth and often gently scratched and bit her when playing. Although the authors did not report performing PCR or serology for *Bartonella*, the patient's nurse practitioner had seen a case of CSD and suggested that the patient had *Bartonella*-induced bacillary angiomatosis. Based on this clinical assumption, the patient was treated with azithromycin for 8 weeks. Despite a recurrence after 6 months, which was treated for an additional 3 months, she recovered fully and all psychiatric symptoms resolved.

Case 3: A Midwestern businessman began to have new adult-onset social anxiety, panic attacks, generalized anxiety disorder, and major depression all of which began several months after returning from a camping and hunting trip in Florida. Shortly after returning from the trip he experienced "flu" and fever for about 9 days. He also developed 3 raised papules under his left arm. He reported no rashes, tick attachments, flea exposure or dog or cat contact. However, his camping partner did have a tick bite and was treated for

Lyme infection due to an oval pink rash. Treatment with psychotic drugs and antidepressants had minimal effect. Although he tested negative for Lyme disease by western blot and *Bartonella* by PCR, he was seropositive for *Bartonella* IgG at 1:128. After failing treatment with doxycycline (100 mg BID) for 3 weeks he was treated with rifampin (300 mg BID) and trimethoprim-sulfamethoxazole (160 mg/800 mg BID) for 1 month. The patient rapidly returned to approximately 85% normal.

Conclusion: Patients with *Bartonella* induced psychiatric disorders generally require higher doses of antidepressants, benzodiazepines, or the use of antipsychotic drugs to function normally. The psychotic signs and depression resolved after treatment for their *Bartonella* infections. The authors stated: "The presence of *Bartonella*-induced psychiatric symptoms should not be surprising. First, psychiatric disorders are brain disorders, and *Bartonella* is documented as causing many diverse neurologic brain disorders. Second, *Bartonella* infections are associated with RBCs, which allow small *Bartonella* bacteria (a fraction of the RBC size) to enter the brain's vascular system. These *Bartonella*-infected RBCs probably cause psychiatric morbidity due to brain pathology, as indicated by the fact that some *Bartonella* patients have neurologic disorders, such as seizures, hemiplegia, ischemic strokes, transverse myelitis, and multiple granulomatous lesions, as well as meningitis and encephalitis."¹⁻³

Editor's Note: This is a very important paper which infers that *Bartonella* may be responsible for some psychiatric and depressive disorders. Such conditions should be investigated in people with frequent contact with cats such as shelter workers, cat breeders, cat "collectors", veterinarians and veterinary hospital personnel.

Musculoskeletal Manifestations of Cat Scratch Disease. Bickels, M.E., et al., Clin Infect Dis, 45:1535, 2007.

Musculoskeletal manifestations (MMs) were studied, over an 11 year period in Israel, in 913 people with CSD. MMs were defined as myalgia, arthritis, arthralgia, tendonitis, osteomyelitis, and neuralgia. 96 of 913 (10.5%) of CSD patients developed MMs. Myalgia and arthropathy occurred most often and usually was chronic in duration. Seven patients had symptoms for more than 1 year and 5 developed chronic disease. The authors conclude that MMs are more common than previously reported and affect 10% of CSD patients. MMs occurred more often in patients older than 20 years of age and arthropathy was more common in females. Osteomyelitis, the most well known MM of CSD, is in fact, the least common.

References:

1. Gerber, J.E., et al. Fatal meningitis and encephalitis due to *Bartonella henselae* bacteria. J Forensic Sci., 47:640-644, 2002.
2. Puligheddu, M., et al. Epilepsia partialis continua in cat scratch disease. Seizure 13:191-195, 2004.
3. Rocha, J.L., et al. Acute hemiplegia associated with cat-scratch disease. Braz J Infect Dis. 8: 263-266, 2004.