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NEWSLETTER

5th International Conference on *Bartonella* as Emerging Pathogens©

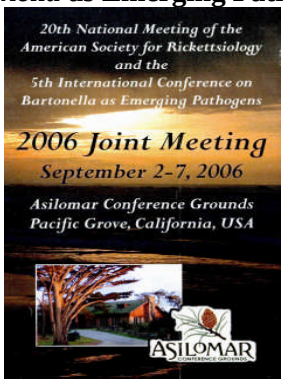
Evelyn E. Zuckerman, Editor **Spring 2007** **Vol. 6, Number 2**

In This Issue:

In the Spring 2007 issue of the NVL Newsletter we will discuss the scientific presentations at the 5th International Conference on *Bartonella* as Emerging Pathogens held in conjunction with the 20th Meeting of The American Society for Rickettsiology, September 2-7, 2006 at the Asilomar Conference Grounds, Pacific Grove, California.

Abstracts

5th International Conference on *Bartonella* as Emerging Pathogens:



The combined meeting had participants from around the world including Australia, Asia, Europe, Russia, China, and North and South America. There were 199 abstracts at the meeting. The majority presented data on Rickettsia, whereas 42 abstracts were *Bartonella* topics. Twelve *Bartonella* abstracts were concerned with human topics, 5 were canine, 5 were small mammal, (rodent), 4 were cat, and 1 was *Bartonella* in cattle. Eight abstracts presented molecular aspects, 3 presented methods of detection (PCR and culture), and 2 each covered vectors and other topics.

Whale watching off of Asilomar

Cat *Bartonella* Abstracts

Cytokine Production Profiles in Experimentally *Bartonella* henselae Infected Cats. H. Kabeya and S. Maruyama, Nihon University, Japan.

This study described the changes in several cytokines as a result of experimental infection with *Bartonella henselae* in 6 SPF cats. All 6 cats developed specific IgG antibody to *Bartonella* proteins indicating infection. Interestingly, *Bartonella* was not always recovered in culture during the bacteremic phase. Some cats were culture positive then culture negative to be followed by culture positive again. The expression of mRNA levels of IFN-γ, IL-4, TNF-α, IL-12p40, IL-10 and TGF-β dramatically increased during bacteremia. The authors concluded that the cell-mediated immune response may play a significant role in the control or elimination of *Bartonella* in cats.

Editor's Note: The *Bartonella* culture isolation variability in known infected SPF cats shows that culture is not an accurate method for diagnosing *Bartonella* infections. In contrast, all 6 infected cats produced antibody against *Bartonella*. In addition, since the elimination of *Bartonella* infection in untreated cats is slow, or non-existent in many cats, the cell-medicated immune response and cytokines may play pivotal roles in the inflammatory process that induces diseases seen in *Bartonella* infected pet cats.

Antibiotic Susceptibility of *Bartonella henselae* Isolated from Domestic Cats in Japan. H. Tsuneoka, M. Tomita and M. Tsukahara. Yamaguchi University School of Medicine, Japan.

These authors isolated *Bartonella* from pet cats in Japan and tested the isolates for susceptibility to various antibiotics. As has been shown by previous workers, *Bartonella* are susceptible to many antibiotics and azithromycin and minocycline were most effective.[1,2] Other antibiotics that were effective include: erythromycin, clarithromyscin, ciprofloxacin, gentamicin, ceftriaxone, and amoxicillin.

Genomic Diversity in Feline and Clinical *Bartonella henselae* Isolates. H. Lindroos, *et al*. Uppsala University, Sweden.

This group studied the genomic diversity of 37 isolates of *Bartonella henselae* isolated from cats and humans from 4 continents. The variation in gene content was low and did not relate to geographic origin or animal host (cat versus human). However, there were frequent gene rearrangements which may facilitate persistent infection by generating antigenic diversity leading to immune escape and persistence.

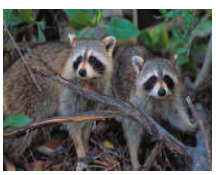
Epidemiology of *Bartonella* Infection in Domestic Animals and Wildlife: An Update. B. Chomel, R. W. Kasten, and J. Henn. University of California, Davis, CA.

This review described the detection of various *Bartonella* species in a diverse group of domestic and wild animals. Canids, particularly dogs, have been found to be infected with 6 species of *Bartonella*, some of which have been shown to infect people.[3] Dogs are much less likely to transmit their *Bartonella* to people than are cats. *Bartonella* have been found in coyotes, gray foxes and raccoons.[3] In addition to pet cats, pumas, bobcats, lions and cheetahs have also been found to be infected.[4,5] Small woodland rodents, voles, mice, rats, and chipmunks have also been shown to carry *Bartonella*.[6] Deer, cattle, sheep, and horses have also been found to be infected. Finally, *Bartonella* has been found in a marine mammal, the dolphin, and in bat ticks and bats.[7,8,9,10]

Animals Recently Found to be Infected with *Bartonella*

Puma

Dolphin



Raccoon

Bat

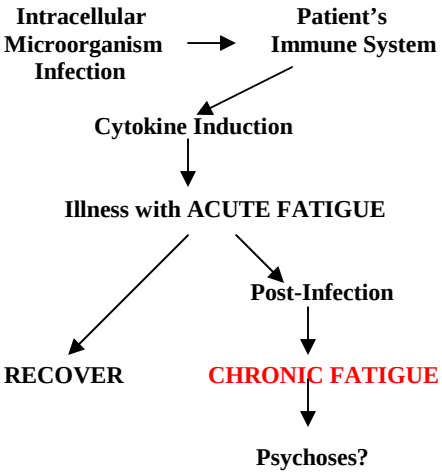
Human *Bartonella* Abstracts

Although there were 12 human *Bartonella* abstracts, we will only discuss 3 in this issue. In addition, we will summarize an important abstract concerning chronic illnesses associated with Rickettsiae, including chronic fatigue. These 3 abstracts bring together observations concerning the chronic illnesses of humans associated with *Bartonella* infections from cats.

Rickettsiae and Chronic Illness, Including Fatigue. S. Graves, N. Unsworth, and J. Stenos, Australian Rickettsial Reference Laboratory, Australia.

The authors describe a chronic fatigue syndrome in 2 patients associated with previous clinical syndromes caused by *Rickettsia honie*. Acute fatigue, along with headache, fever, myalgia, arthralgia and cerebral dysfunction, are caused by many infectious agents and are probably mediated by cytokines. In some patients, chronic fatigue is observed as a post-infectious sequelae in infections caused by intracellular microorganisms such as viruses (EBV), *Rickettsiae*, and *Bartonella* (Editor's addition). The symptoms are similar to, but less severe than, those of acute infections and suggest dysregulated cytokines as a possible cause.

Genesis of Post-Infection Chronic Fatigue



Musculoskeletal Manifestations of Cat-Scratch Disease. E. Maman, *et al*. Tel-Aviv Sourasky Medical Center, Tel Aviv University, Tel-Aviv, Israel.

This was a large 11 author multi-center study of 913 cases of cat scratch disease (CSD) over an eleven year period. The authors note that, before their study, CSD was a common cause of regional lymphadenopathy, affecting mainly children and adolescents. (Editor's note- recent studies and our abstract that follows show that 50% of CSD cases occur in people older than 21 years of age). Musculoskeletal manifestations (MMs) were considered rare and it was the aim of this study to determine how often MMs (myalgia, arthritis, arthralgia, tendonitis, osteomyelitis, and neuralgia) occur in patients with CSD.[11,12,13,14,15]

Surprisingly 96 of the 913 (10.5%) CSD patients developed MMs. Myalgia occurred in 53 patients and was often severe, lasting an average of 4 weeks (1 to 26 weeks). Arthropathy (arthritis/ arthralgia) occurred in 50 (5.8%) patients lasting an average of 5.5 weeks (1-240 weeks). In 7 patients the arthropathy lasted more than 1 year and 5 patients developed chronic disease. Tendonitis (mainly of the Achilles tendon), neuralgia, and osteomyelitis occurred less frequently. Patients with MMs were significantly older than those that did not develop MMs. Patients who developed MMs had an average age of 31.5 years compared to an average age of 15 years for the controls. Arthropathy was associated with female gender and with erythema nodosum. The authors described several cases of extreme, long lasting, chronic fatigue syndrome in world class athletes who were "unable to pull themselves out of bed or the chair."

This study found that musculoskeletal sequelae occur in 10% of CSD patients. Osteomyelitis, the most well known MM of CSD, was the rarest in this study.[15] Therapy with azithromycin or rifampin was not effective in alleviating the chronic musculoskeletal symptoms.

Our meeting abstract is reproduced below. With the assistance of many of you, we interviewed several hundred cat owners who were diagnosed with, or were thought to have, a *Bartonella* disease derived from their association with a cat that we tested for *Bartonella*. Our aim was to determine the signs of their illnesses, whether their veterinarian had discussed the zoonotic dangers of feline *Bartonella* with them BEFORE they became ill, and to determine their physician's knowledge of *Bartonella* diseases derived from cats. As you will see, we found that both veterinarians and physicians need to become more aware of the dangers of feline derived *Bartonella* infection in people. We are most thankful to those of you who asked your clients to call us so that we could administer our *Bartonella* disease questionnaire.

Human Bartonellosis: Diseases Caused by Feline *Bartonella*- 84 Cases. W. D. Hardy, Jr., & E. E. Zuckerman, National Veterinary Laboratory, Franklin Lakes, NJ.

The CDC does not require reporting of human *Bartonella* infections or diseases. In addition, the American Association of Feline Practitioners does not recommend *Bartonella* tests for healthy cats. We investigated 84 human patients with serologically or biopsy confirmed *Bartonella* diseases, associated with cats, to assess if physicians are aware of the varied clinical signs of bartonellosis and if the CDC and AAFP recommendations regarding testing of healthy cats are appropriate. 68 (81%) patients had classical cat scratch disease (CSD) with the regional lymphadenopathy prodrome and 14 (17%) had a papule at the scratch or bite site. 46 of the 68 CSD patients had no sequelae after the prodome, whereas 22 patients had 13 various sequelae such as chorioretinitis, mononucleosis syndrome, vegetative valvulitis, or meningoencephalitis. 16 patients had no prodrome of classical CSD and had: chorioretinitis (3), arthritis (2), neurological disease (2), myositis (2), and various other conditions (7). There were 8 veterinarians and 7 veterinary technicians who were infected via occupational exposure. The routes of infection were: 38 unknown, 37 scratches, 3 bites, 3 by giving oral medication to their *Bartonella* infected cats, 1 via excessive licking of a child, and 1 each via flea and tick bites. 17 patients were examined by 3 or more physicians (maximum 10) before a diagnosis of CSD or Bartonellosis was made. 67 of 70 (96%) offending cats were serologically positive for *Bartonella*. 40 cats (57%) were healthy whereas 30 had *Bartonella* induced inflammatory diseases. 29 of the 70 (41%) cats were kittens under 1 year of age. Offending cats were identified and most treated however, 4 patients were told by their physicians to remove their cats. Our findings suggest the recommendations regarding the testing and treatment of healthy cats, especially kittens, be reconsidered and that physicians should become more aware of the varied clinical manifestations of bartonellosis.

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For more *Bartonella* references:

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