In This Issue:
The summer 2003 issue of the NVL Newsletter will review the pathogenesis and the spectrum of feline Bartonella diseases.

Bartonella Pathogenesis
Feline Bartonella are Gram-negative bacilli that possess pili which are hair-like structures found on the bacteria’s surface. Bartonella have a strong tendency to stick or clump together in tissues and in culture and to stick to, and penetrate, RBCs and endothelial cells. The ability to adhere to each other, and to the membranes of RBCs and endothelial cells, leads to the wide and varied tissue pathogenesis observed in cats, dogs and people. Pili and a protein called deformin are probably responsible for the sticky properties.1

The wide tissue tropism of Bartonella is due to the adhesion to endothelial cells which are the constituents of capillaries. Bartonella proteins stimulate endothelial cells (Figure 1) to proliferate causing neovascularization or angiogenesis. Thus, Bartonella induce chronic lymphocytic plasmacytic granulomatous inflammatory reactions in highly vascular tissues throughout the infected animal’s body. These tissues are: oral and respiratory mucosa, ocular tissues, the gastrointestinal tissues, the skin, and organs such as the liver, spleen and lymph nodes. In fact, since capillaries are found in all tissues, all tissues are susceptible to the inflammatory effects of Bartonella. The tissue reactions are apparent to the cat owners and veterinarians in the mucosa of the mouth, eye and respiratory tract or evidenced in the GI tract by chronic vomiting or diarrhea.

Figure 1  Bartonella Inflammation

Legend: The black rods (--) represent Bartonella in the skin or mucosa. The bacteria induce angiogenesis (arrow) and an outpouring of inflammatory cytokines which recruit inflammatory cells such as lymphocytes, plasma cells and macrophages.

Feline Bartonella Diseases:
Feline Bartonella diseases are characterized by chronic inflammation of vascular tissues.2-16 Inflammatory reactions often occur concurrently in multiple sites such as the oral and respiratory tissues, ocular and oral tissues or in other combinations. Although numerous pathogenic organisms can cause inflammatory diseases in various tissues, it appears that Bartonella is the cause of about 50% of the following conditions.14,16

Feline Bartonella Diseases:
Oral Disease:
Gingivitis
Stomatitis
Oral Ulcers
Submandibular lymphadenopathy

Respiratory Diseases:
URI
Rhinitis
Sinusitis

Ocular Disease:
Uveitis
Chorioretinitis
Conjunctivitis

Intestinal Diseases:
Inflammatory bowel disease
Diarrhea (chronic)
Vomiting (chronic)

Other Diseases:
Lymphadenopathy
Fever of unknown origin
Hepatic peliosis
Bacillary angiomatosis
Valvular heart disease (murmurs)

The following are a group of photographs of Bartonella diseases of pet cats.

Proliferative gingivitis

Juvenile gingivitis

Oral ulcers

Upper respiratory disease- chronic

Rhinitis- chronic 1.5 years

Experimentally induced feline diseases include: fever, lymphadenopathy, renal disease, neurological signs, anemia, reproductive failure, cardiac lesions and cholangitis.6,8,12,13 We and others have described chronic inflammatory diseases associated with Bartonella infections in pet cats.2,4,7,14,16 It should be noted that many of these diseases, identical to those seen in cats, were first found to be caused by feline Bartonella in humans.

Bartonella references can be obtained at:
www.nlm.nih.gov/
Therapy

Therapy of feline Bartonella diseases is relatively easy. We recommend oral azithromycin-10mg/kg once daily for 21 days. We have reported successful therapy results in approximately 80% of cats with Bartonella diseases. Therapy failures may be explained by the possibility that the presence of Bartonella in these cats, may represent only coincidental infections and may not be the cause of the clinical disease.

Therapy Results:

Gingivitis: Before After

Respiratory Disease: Before After

Conjunctivitis: Before After

Skin Nodule: Before After

Uveitis & Conjunctivitis: Before After

References: