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NEWSLETTER

Commonly Asked *Bartonella* Questions[©] Summer 2004

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In This Issue:

The Summer 2004 issue of the NVL Newsletter will answer some of the commonly asked questions concerning *Bartonella*.

Commonly Asked *Bartonella* Questions:

Bartonella Testing:

1. Why do you require the age and diagnosis for all *Bartonella* tests on the submission form?

Answer: It is very important for us to know the age and diagnosis for all cats and dogs being tested for *Bartonella* because we make specific recommendations regarding therapy or re-testing based on these factors and the test result. For example kittens under 6 months-of-age, who have a typical *Bartonella* inflammatory disease, but test negative or +1 (uninfected) for *Bartonella* should be re-tested 2 months later. These kittens may be incubating *Bartonella* infection, which is causing the inflammation, but not enough time has elapsed for the production of detectable antibody. In this regard, 11 of 65 (17%) kittens retested 8 weeks later were positive (infected). This is important for eventual therapy recommendations and for the public health implications.

2. What is the earliest age a kitten should be tested for *Bartonella*?

Answer: Any age kitten should be tested because kittens are more likely to transmit *Bartonella* to people, especially children, due to their playful nature. Although antibody in kittens may be of maternal origin, we recommend that all FeBart[®] test positive (+3 or +4) kittens be considered infected and should be treated.

3. What is the occurrence of "false negative" FeBart[®] tests?

Answer: About 4-6% of *Bartonella* infected cats do not produce detectable antibody and thus test negative.^{1,2} This is not truly a "false negative" in that the test is not in error. A similar situation occurs in people with *Bartonella*-induced cat scratch disease. Only 80% of people with CSD are antibody positive.

4. In multi cat households where one cat tests positive for *Bartonella*, should I just treat the other cats rather than test all of them?

Answer: **No, No, No, No!!!** It is very poor veterinary medicine to indiscriminately treat cats

with antibiotics without knowing if they are infected with the organism for which you are treating. The possibility of creating antibiotic resistant strains of bacteria is likely with this approach. We recommend treating only *Bartonella* test positive cats. This may actually result in a monetary saving for your clients considering the expense of antibiotic therapy and considering the prevalence of *Bartonella* infection in healthy cats (~20%).

5. There are 6 known *Bartonella* species in cats. What species does the FeBart[®] test detect?

Answer: There are presently 6 recognized *Bartonella* species that infect pet cats. Unlike other serological tests, the FeBart[®] test detects all 6 species and even species from other animals such as dogs, cattle, deer, and humans. Our test is a western immunoblot where we purify our isolate of *Bartonella*, break it up into component proteins which are then separated by gel electrophoresis into individual proteins based on their sizes (molecular weights).¹ The approximate 20 proteins are then transferred to nitrocellulose paper strips and reacted with cat or dog sera. The numerous antibodies found in infected cats, dogs and people react with the bacterial proteins and give a "fingerprint" of the immune reaction. The antibodies are cross-reactive with the various homologous proteins of the different *Bartonella* species.

Bartonella Therapy:

6. Should healthy *Bartonella* infected cats be treated?

Answer: **YES.** All healthy *Bartonella* infected cats should be treated to prevent disease occurrence in the cat, to prevent transmission to people, and to remove the host reservoir of infection for fleas, ticks and possibly mites.

7. Why do you recommend 21 days of azithromycin therapy when, in humans, azithromycin is usually given for only 5 days?

Answer: Azithromycin (Z-Pack) therapy in humans is usually only 5 days for respiratory infections but is given for up to 6 weeks when treating *Bartonella* diseases.^{3,4} We, and others have shown that it is necessary to treat infected cats for at least 21 days since *Bartonella*, although not an obligatory intracellular parasite, does live in macrophages, endothelial cells and red blood cells.^{5,6,7} Thus, in order to

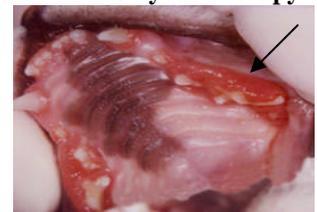
penetrate these cells, it is necessary to treat for a long period as with Lyme Disease.

8. How soon should I see clinical improvement after treatment of *Bartonella* infected cats with inflammatory diseases?

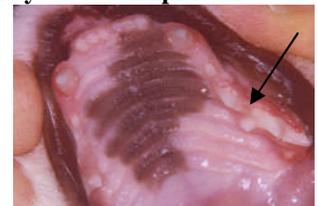
Answer: The length of time required to see therapy responses can be variable depending on the initial duration (chronicity) of the disease. Most cats that respond show improvement by 10 to 14 days from the start of therapy. As seen in the photographs below of a 5 month-old *Bartonella*-infected kitten with severe gingivitis, marked improvement (80%) occurred by 14 days and complete resolution by 28 days. If no improvement occurs by 21 days we suggest re-treatment for an additional 21 days with azithromycin or rifampin. In some cats (~17%) the inflammatory condition may not improve at all, which indicates that *Bartonella* is not the cause of the condition.^{5,6}

Severe Gingivitis

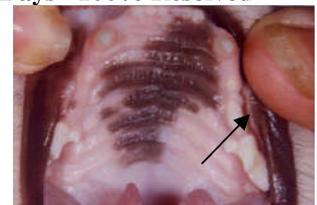
Before Azithromycin Therapy



14 Days- 80% Improved



28 Days- 100% Resolved



Case photographs courtesy of:
Jan Corbishley, B.S., V.T.
Oradell Animal Hospital, Paramus, NJ

9. What are the adverse side effects of azithromycin and rifampin therapy in cats?

Answer: As in humans, azithromycin therapy can induce GI upset resulting in vomiting and diarrhea. There are no reports of other more severe adverse effects, although recently a case report has associated azithromycin therapy with an aplastic anemia in a cat.⁸ Adverse reactions with rifampin therapy consist of allergic reactions, pruritis, redness, and swelling of the face and paws. **If you feel that you have seen an adverse reaction to azithromycin or rifampin please let us know so that we can compile this information.**

10. Should Bartonella infected pregnant cats be treated?

Answer: No studies have been done regarding the effects of azithromycin or rifampin therapy in pregnant cats. Thus we recommend that infected pregnant cats not be treated until after they have their litters and their kittens are weaned.

Therapy Evaluation:

11. How can we determine if the Bartonella infection has been eliminated after therapy?

Answer: The only way to determine if *Bartonella* has been eliminated after therapy is to run a comparative therapy titration test.^{5,6} We compare the titer from the first sample, which we have saved frozen, with a sample submitted **6 MONTHS AFTER THE END OF THERAPY**. A 4 fold or greater drop in titer indicates successful *Bartonella* therapy.

12. Why can't we just re-test cats with the FeBart® test after treatment rather than the more expensive comparative titration test?

Answer: In most cats a FeBart® positive result will not change for years, even after successful therapy, because the western blot is done at a 1:100 dilution. In contrast, in the comparative titration test 4 western blots are performed for the pretreatment sample and 4 for the post treatment sample in order to determine if the titer decreases. Some cat's titers are as high as 1:2,048,000 and will remain well above the 1:100 screening dilution, that is used in the FeBart® test, long after *Bartonella* has been eliminated. About 88% of treated cats show a decrease titer indicating successful *Bartonella* therapy.

13. Why do we have to wait 6 months after the end of therapy to do the comparative titration test to determine if therapy is successful?

Answer: It takes 6 months for the antibody titer to decrease 4-fold or greater after removal of an antigen, in this case *Bartonella*.^{5,6} Antigenic stimulation of memory T cells and B cells must be turned off allowing the preformed antibody to be catabolized over a 6-month period. Approximately 20% of treated cats will show sufficient antibody titer decrease by as early as 3 to 4 months. However for most cats, performing the therapy titration test before 6 months will not detect a sufficient decrease.

14. Why do you need to know the % improvement after therapy on the test submission form when we request the therapy titration test?

Answer: The comparative titer is reported in a range of 0-fold or greater decrease with the median

being a 4-fold decrease. For cats with no titer decrease or with only a minimal 2 fold decrease, where the inflammatory condition has not completely (100%) resolved, we recommend re-treatment with either azithromycin or rifampin for 21 days. We cannot make any recommendation if the exact (%) clinical response is not indicated. In addition, we need these data to properly assess our therapy protocol outcomes, which will allow us to modify our treatment recommendations if indicated by the data.

Bartonella Biology:

15. Are dogs susceptible to Bartonella infection and what are the diseases caused by Bartonella in dogs?

Answer: Yes, dogs are carriers of 6 species of *Bartonella* and they develop very similar inflammatory diseases (except oral inflammatory diseases) that have been described in cats and humans. However, the incidence of infection is lower in dogs than in cats and tends to be highest in areas where ticks are common. In this regard, a recent study found 34% of ticks in New Jersey were carriers of *Bartonella*.⁹ We have found infected dogs with the following conditions: lymphadenopathy, chronic fevers of unknown origin, uveitis, polyarthritis, heart disease, liver disease, and skin granulomas.

16. How are Bartonella transmitted; can they be transmitted directly from cat to cat?

Answer: *Bartonella* are mainly transmitted among most animals by arthropod vectors. Fleas and ticks are major vectors for transmission among cats and dogs.¹⁰ Ear mites may be able to transmit *Bartonella* among cats but direct proof of this has not yet been obtained. Sand flies and lice transmit human *Bartonella* among certain populations of people, inner city homeless (lice) and people living in the Andes Mountains (Sand flies). Direct, non-vector, transmission of feline and canine *Bartonella* occurs via scratches, bites and contact with fur, to people. Fleas and ticks may also transmit *Bartonella* from cats and dogs to people. Direct cat to cat (non-vector) transmission probably does occur rarely by bites and scratches. It probably occurs as often as does cat to human transmission.

17. Are there any adverse effects of Bartonella infection in pregnant women?

Answer: We have often been asked if *Bartonella* can cause medical problems in pregnant women. A literature search has not revealed any publications concerning *Bartonella* infection during pregnancy. However, experimental *Bartonella* infection in cats does cause reproductive problems.¹¹ Thus, it is advisable that pregnant owners of *Bartonella* infected cats avoid contact until the cat has been treated by another family member.

More than 1400 Bartonella references can be obtained at: www.nlm.nih.gov/

We will be presenting 2 papers at the 4th International *Bartonella* Meeting in Uppsala, Sweden in August. One paper describes ocular *Bartonella* diseases (coauthors Dr. Kerry Ketting, All Animal Eye Clinic, Cincinnati, OH and Dr. Craig Fischer and Dr. Melanie Mineo, Animal Eye Clinic of Florida, Clearwater, FL) and the other describes feline diseases and therapy. We thank the thousands of practitioners who have helped us obtain these data. We will report any new information obtained from investigators from around the world in future Newsletters.

REQUEST FOR PHOTOS:

Please contact us if you have taken before and after therapy photographs of Bartonella infected cats with inflammatory diseases and would like to share them with us for inclusion in our Newsletters. We would also like photos of Bartonella infected dogs with inflammatory diseases.

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