ABSTRACTS

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Brucella canis: a threat to canine and human health

Carter, T and Johnson, C

Department of Small Animal Clinical Sciences, College of Veterinary Medicine Michigan State University, East Lansing, MI USA 48824-1314

cajohnson@cvm.msu.edu

OBJECTIVES AND METHODS: 1) Evidence-based review of the pathogenicity and epidemiology of canine and human *Brucella canis* infection, and results of therapeutic trials in dogs. 2) Epidemiology of a *Brucella canis* outbreak in Michigan associated with interstate transport of mix-breed dogs intended for sale as pets. The results of serologic and bacteriologic tests for *B. canis* from the Diagnostic Center for Population and Animal Health at Michigan State University, and files of *B. canis* cases reported to the Michigan Department of Agriculture from 2007 to 2010 were reviewed.

RESULTS: 1) Brucella canis organisms are shed in aborted material, post-abortion vaginal discharge, semen, urine and milk, and readily cross all mucous membranes. Oral-nasal contact with infected fluids or tissues, contaminated pens and fomites, and aerosolized material is the most common mode of transmission. Contrary to commonly held belief, venereal transmission is not the most important. Although venereal transmission occurs, neutered and "virgin" animals become infected as easily as sexually intact animals sharing the same contaminated environment. Bacteremia begins 1 to 4 weeks after infection and persists for 6 months to 5.5 years. Non-protective antibodies usually are not detectable until 8 to 12 weeks after inoculation. Titers decline as bacteremia subsides, but organisms persist in mononuclear phagocytes, bone marrow, lymph node, spleen and prostate. The most common clinical signs of B. canis infection are abortion in females and infertility/sterility in males. Otherwise animals are asymptomatic unless B. canis infects non-reproductive organs, which is uncommon. B. canis uveitis, diskospondylitis, osteomyelitis, dermatitis, meningoencephalitis and glomerulonephropathy are reported. To date, therapeutic trials with tetracycline, oxytetracycline, dihydrostreptomycin, streptomycin, gentamicin, sulfonamides, ampicillin, third-generation cephalosporins, rifampin, neomycin and enrofloxacin, and combinations thereof, with and without castration/ovariohysterectomy have not been curative. The prevalence of human B. canis infection in the United States is unknown. The Center for Disease Control does not require speciation of Brucella cultures. Serologic tests used in people detect antibodies against B. melitensis and B. abortus, but not B. canis. B. canis infection causes clinical disease in people as do other Brucellae, including "undulant fever", osteomyelitis, meingoencephalitis, and endocarditis. Relapse following treatment is common. "Cure" is documented by bone marrow culture. Contact with infected dogs is the most common source, but often there is no known contact.

2) From 2007 to 2010, 153 dogs in 9 commercial kennels in Michigan, and 10 privately-owned pet dogs were diagnosed with *Brucella canis*. The source of infection in the kennels was acquisition of dogs from kennels in Ohio and Indiana, and movement of animals or stud service among Michigan kennels. Prevalence within individual kennels ranged from 7.4% to 84.2%. Tracing sales from infected kennels led to 10 pet dogs, 6 of which were positive. Five pet dogs with no known association with infected kennels were diagnosed with *B. canis*. One had orchitis. One had vaginal bleeding. A pet bitch and her litter were brought from Kentucky to Michigan. Three of the 5 pups were infected, one with diskospondylitis.

CONCLUSION: There is no successful treatment for *Brucella canis* in dogs. Infection within a kennel is devastating. The sale and movement of pet dogs plays a significant role in the epidemiology. The risks to canine health, regardless of neuter-status or intended purpose, and the risk to the health of the unsuspecting public are real.

(1) Greene CE, Carmichael LE. Canine brucellosis. In: Greene CE, ed. Infectious diseases of the dog and cat. 3rd ed. St. Louis: Elsevier, 2006; 369-81.

(2) Carmichael LE, et al. Transmission of Brucella canis by contact exposure. Cornell Vet 1988; 78: 63-73.

(3) Hollett RB. Canine brucellosis: outbreaks and compliance. Theriogenology 2006; 66: 575-587.

(4) Wanke MM, et al. Use of enrofloxacin in the treatment of canine brucellosis in a dog kennel (clinical trial) Theriogenology 2006 66:1573-1578.

(5) Johnson CA, Walker R. Canine brucellosis. Diagnosis and control. Compend Contin Ed 1992

(6) Brower A, et al. Investigation of the spread of Brucella canis via the U.S. interstate dog trade. Int J Infect Dis 2007; 11: 454-58.

(7) Pappas G, et al. Brucellosis. N Engl J Med 2005; 352:2325

(8) Lucero NE, et al. Human Brucella canis outbreak linked to infection in dogs. Epidemiol Infect 2010; 138: 280-85.

(9) Piampiano P, et al. Brucellosis: unusual presentations in two adolescent boys. Pediatr Radiol 2000; 30: 355-57.

(10) Lucero NE, et al. Brucella canis causing infection in an HIV-infected patient. Vector Borne Zoonotic Dis 2010; 10: 527-9.