

## OREGON PUBLIC HEALTH DIVISION • DEPARTMENT OF HUMAN SERVICES

### ZOONOSES I: LYME DISEASE AND BACTERIAL PET-BORNE INFECTIONS

**M**ANY infectious diseases of humans are zoonoses — that is, we get them from animals, often our pets. This first of a two-part series describes selected pet-borne bacterial zoonoses, with Lyme disease, a tick-borne bacterial zoonosis, thrown in for good measure.

#### LEPTOSPIROSIS

On January 30, 2007, a 50-something veterinarian went to the emergency department after three days of anorexia, fever, arthralgia, malaise, nausea and vomiting. The good doctor was admitted to the hospital two days later with fever, dizziness, blurry vision, dehydration, and a mild cough. Viral and bacterial cultures of the CSF were negative, as were blood cultures. The veterinarian had examined a dog for fleas approximately ten days before illness onset, and the dog had urinated on the vet. Urine may have contaminated minor nicks and scrapes on the veterinarian's hands. The diagnosis, made serologically, was leptospirosis.

Leptospirosis is found worldwide, and *Leptospira* species are commonly found in rats, mice, pigs and dogs, and other animals. While all dog breeds are susceptible to leptospirosis, hunting dogs, show dogs, and dogs with access to water, such as ponds, are at highest risk. Canine vaccination is available and encouraged.

Canine leptospirosis ranges from asymptomatic to severe. Initial signs can include any or all of the following: lack of appetite, vomiting, abdominal pain, fever, canine depression (there is such a thing!), anorexia, and general, unusual stiffness. Symptomatic dogs and dogs whose humans have leptospirosis should be tested for leptospirosis by urine PCR (OSU Veterinary College, Corvallis, OR) in the very early stages of the disease and prior to antibiotic treatment or confirmed serologically 3–5 days after the onset of illness. Lep-

tospirosis is treated with tetracycline or doxycycline, and most treated dogs and their humans recover after about two weeks.

Human leptospirosis is reportable in Oregon, and we ask veterinarians to report canine cases as well. Human cases usually report contact with water such as swimming or wading in creeks. Since mid-2006, Oregon veterinarians have reported 45 dogs with leptospirosis. The average age of these dogs was 5.8 years, 25 (56%) were females, and most of the breeds were labradors, golden retrievers, German shepherds and border collies, with an occasional poodle or dachshund. All but one of the canine cases were reported west of the Cascades.

An average of one human case is reported annually in Oregon. Of the 14 human cases since 1989, 12 (86%) were males with an average age of 36 years (range 20–54 years). Protective measures such as wearing gloves and limiting urine exposure to mucous membranes should be considered. Because of the nature of their work, veterinarians, technicians and assistants are at risk of exposure.

#### CAT-SCRATCH DISEASE

Although seen frequently in clinical practice, cat-scratch disease (CSD) is not reportable. It is caused by the rickettsia-like organism *Bartonella henselae*. About 90% of CSD patients have a history of cat contact. Other cases of CSD have anecdotally been associated with dog, rabbit, and monkey contact.

In uncomplicated CSD, a non-tender papule at the site of inoculation is followed by regional lymphadenopathy, which develops 1–2 weeks later. Regional nodes enlarge for 2–3 weeks and then recede over the next 1–2 months. Nodes may be small and asymptomatic or massively enlarged for several months. They may suppurate late in their course and require needle aspiration for relief. Fever occurs in approximately half of symp-

tomatic patients; malaise, anorexia, and headache can also be present.

A survey of pet and pound cats in the San Francisco Bay area found 41% (25 of 61) to be bacteremic with *B. henselae*, some for months and some indefinitely. *B. henselae* infection is widespread in cats. The U.S. has 57 million pet cats (a third of American households have them), so there is a large reservoir from which *B. henselae* can be acquired by humans.

Exposure to kittens or young cats — especially kittens with fleas — is associated with the development of CSD in immunocompetent hosts. Some healthy-appearing cats may have very high levels of bacteremia. The need for treatment of CSD in children is questionable; most cases resolve without antibiotics. Azithromycin may hasten resolution of the lymphadenitis.

#### ANIMAL BITES

Animal bites are a significant public health problem, and the number of bites appears to be increasing. Ninety percent of animal bites are from cats and dogs; 3%–18% of dog bites and 28%–80% of cat bites eventually become infected. Most infected bite wounds harbor multiple organisms, especially *Pasteurella* spp. Streptococci and staphylococci are found in both dogs and cats. *Moraxella* spp. are also common in cat bites.

Bite wounds should be cleansed thoroughly and promptly. Tetanus prophylaxis should be considered. Bites by cats and humans are those most likely to be infected. Treatment with  $\beta$ -lactam antibiotic and a  $\beta$ -lactamase inhibitor is appropriate.<sup>3</sup>

Remember that bites of humans by mammals are reportable in Oregon; public health officials can help with decisions regarding the need for rabies post-exposure prophylaxis.\*

\*for more information on rabies in Oregon, see our July 25, 2006, issue, available at <http://oregon.gov/DHS/ph/cdsummary/2006/ohd5515.pdf>



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### LYME DISEASE

Lyme disease (LD), caused by the spirochete *Borrelia burgdorferi* and transmitted by *Ixodes* tick bites, is currently the most frequently reported arthropod-borne infection in the United States. The best clinical marker for the disease is the initial skin lesion erythema migrans, which occurs in 60%–80% of cases. In its early stages, LD can be easily treated with oral antibiotics. Without treatment, chronic arthritis, cardiac disease or CNS infection may ensue.

*Ixodes* ticks are found in the 21 Oregon counties west of the Cascades from the Washington to the California border, and along the Columbia Gorge as far east as Wasco County. The risk is low here compared to other parts of the country: during 2000–2006, 123 cases of LD were reported in Oregon — a rate of 0.5 cases/100,000/year. The average age of the patients was 40 years, and 56% were female. Residents of Jackson and Josephine Counties were at highest risk — 2.4/100,000 and 2.7/100,000 per year, respectively. Most cases of Lyme disease are reported between May and October.

This low risk of LD that accompanies our outdoor pursuits can be lessened further by simple precautions: wear light-colored clothing (ticks are easier to see); tuck long pants into socks to prevent tick bites; avoid tall grass and shrubby areas whenever possible; and wear a tick repellent containing permethrin or DEET, which repel 82%–100% of ticks. Those intent on recreating in tall grass while scantily clad in dark-colored clothes

and no tick repellent can lessen the risk of LD by checking themselves for ticks following their venturesome activity.

Only a few canine LD cases have been reported in Oregon; most of these were in Southern Oregon where risk is also highest for humans.

### MRSA IN PETS

Methicillin-resistant *Staphylococcus aureus* (MRSA) was named in 1961 to describe isolates of *S. aureus* in which resistance to methicillin (and, more broadly, to the entire class of  $\beta$ -lactam antibiotics) had been detected. Until the late 1990s, MRSA infections were problematic primarily in the hospital setting, as the disease was limited to those with “established health care risk factors” (frequent contact with health care system, previous infection or colonization, or a history of invasive devices or procedures).

The jump of MRSA to animals was expected due to the close relationship between animals and humans. In the late '90s, reports of MRSA infection and colonization in pets were reported, and the number of isolates has increased dramatically in the past few years. Although this rise may be partially the result of increased testing and reporting, MRSA is definitely emerging in pet populations throughout the world. The role of pets in transmission of MRSA is still unclear; however, recent evidence suggests that MRSA can be transmitted between humans and their pets, in both directions. Reports of MRSA infection and colonization in pets indicated that pets tend to be infected with

strains that are predominant in the human population in their area.

Accordingly, the “USA100” hospital-associated MRSA strain accounted for the initial MRSA isolations from pets in North America. Not surprisingly, the “USA300” community-associated MRSA strain has now emerged as a cause of disease in pets. MRSA is emerging as an important veterinary and zoonotic pathogen, and the epidemiology of MRSA in household pets may parallel that in humans.<sup>5</sup>

### CONCLUSION

Humans and pets can share affection and infection. Veterinarians can be helpful allies in the diagnosis of zoonotic ailments. Stay tuned for the next issue, which will feature parasitic zoonoses.

### REFERENCES

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