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ANIMAL AND HUMAN HEALTH PREVENTION OPPORTUNITIES

Leptospirosis

Leptospira are obligate aerobic, gram negative bacteria found in soil and water worldwide on all continents except Antarctica. To date, over 250 pathogenic serovars and 50 nonpathogenic serovars have been identified. Different *Leptospira* serovars are generally adapted to one or more mammalian or marsupial hosts, which might or might not develop clinical signs of illness. *Leptospira* are spread through the urine of infected animals. The bacteria can cause damage to the liver and kidneys of both humans and animals. In the United States, about 100–150 cases are identified annually. In this issue of Montana One health, we will describe human and animal leptospirosis cases and how to reduce the risk of infection.

Animal Health

All mammalian species are susceptible to infection from pathogenic *Leptospira*, but some species are more resistant to disease. Leptospirosis is most commonly recognized in cattle, swine, dogs, and horses. Wildlife are also commonly infected with *Leptospira* and in many instances, are the maintenance hosts.

Animals become infected by direct contact with infected urine, placental fluids or milk; or indirectly through contact with areas contaminated with infected urine. In some host/serovar combinations, transplacental and venereal transmission can occur. The incubation period ranges from 4 to 20 days. *Leptospira* infections in animals varies from asymptomatic, mild to severe, and acute or chronic. When the infection occurs in a maintenance host, the infection tends to be mild and when the serovar is not adapted to the host, more severe disease occurs. Clinical signs in incidental host include an acute febrile illness with renal and/or hepatic damage. Some incidental hosts can also develop uveitis, pancreatitis, bleeding, hemolytic anemia, muscle pain and respiratory disease. Maintenance hosts often have a subclinical illness. Infections in pregnant incidental and maintenance hosts can result in abortion, stillbirth, weak neonates, or healthy chronically infected offspring.

Leptospirosis is usually diagnosed by serology, but immunofluorescence, PCR, and culture can also be used. Ease of leptospirosis diagnosis depends on whether the infection is in a maintenance or incidental host. In maintenance hosts, the antibody response is relatively low and few organisms are present. Diagnosis in incidental hosts is easier because a marked antibody response occurs and large numbers of organism are present. For domestic animals, vaccination is the cornerstone of prevention. However, no vaccine exits for horses. Vaccination prevents clinical signs of disease and has been shown to significantly reduce renal colonization and urine shedding. Animals with leptospirosis can be treated with antimicrobial therapy.

Human Health

Leptospirosis incidence is higher in tropical climates, but cases and outbreaks have occurred in the United States. Humans become infected through direct contact with urine or reproductive fluids from infected animals; or indirectly through contact with contaminated water or soil; or by consuming contaminated food or water. The bacteria enters the body through the skin, especially if cut or abraded, and the mucus membranes (eyes, nose, or mouth). Leptospirosis is an occupational hazard for people working outdoors or with animals.:

- Farmers
- Mine workers
- Sewer workers
- Slaughterhouse workers
- Veterinarians and animal caretakers
- Fish workers
- Dairy famers
- Military personal

The incubation period varies from 2 to 30 days. However, illness usually develops between 5 to 14 days after exposure. Human infections vary greatly in their presentation. Most human infections are asymptomatic. When clinical signs occur, most present as an acute self-limiting febrile illness.

However, in about 5% to 10% of patients, a severe potentially life-threatening illness develops. Severe disease has two phases, an acute phase with fever, chills, headache, muscle aches, vomiting or diarrhea from which the patient might recover. If a second phase occurs, the disease is more severe with multi-organ dysfunction including jaundice, renal failure, hemorrhage, aseptic meningitis, cardiac arrhythmias, pulmonary insufficiency, and hemodynamic collapse.

Leptospirosis is usually diagnosed by serology, but real-time PCR can be used during the acute phase. Early antimicrobial therapy can be effective in decreasing the severity and duration of disease. People with severe disease might require hospitalization with intravenous antibiotics and other supportive care. Some studies have shown prophylaxis with antimicrobials might be effective in preventing clinical disease. People with high risk exposures should consult with their health care provider to determine if prophylaxis is warranted. No human vaccine exists for leptospirosis, so prevention is key.

Prevention centers on decreasing exposure risks, including avoiding contact with contaminated water (especially flood waters) and potentially infected animals or their body fluids. Persons in high risk occupations or who participate in high risk recreational activities should wear personal protective equipment to minimize exposure including rubber boots, waterproof coveralls/clothing, and gloves. In addition, any open wounds should be covered with waterproof dressings.

Leptospirosis—Key Points

Animal Health

- Veterinarians should work with clients to ensure appropriate vaccination for domestic species
- Veterinarians should be aware of clinical signs of leptospirosis and use appropriate personal protective equipment to minimize risk of exposure
- If a high risk exposure occurs, consult with your health care provider to determine if prophylactic antimicrobial therapy is warranted
- Veterinarians should immediately report any cases of leptospirosis to the Montana Department of Livestock at (406) 444-2043

Human Health

- Clinicians should consider leptospirosis as a diagnosis in patients with compatible clinical illness
- Clinicians should counsel patients about risks and prevention opportunities, especially for travelers to tropical climates
- Clinicians should work with their local health department to determine if a high risk exposure warrants prophylactic antimicrobial therapy
- Clinicians should immediately report any cases of leptospirosis to their local health department

References available on web version. Visit http://www.dphhs.mt.gov/publichealth/publications.shtml.

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