VENTURA COUNTY PUBLIC HEALTH

Hot Tips
a Public Health Advisory

RIGOBERTO VARGAS, MPH, DIRECTOR

ROBERT M. LEVIN, MD, HEALTH OFFICER

HOT TIPS #108 DATE: 07/19/2019

Please copy and distribute to ALL physicians at your location.

Tularemia Alert for Ventura County

A dead rabbit was recently found in Moorpark. It was tested and found to have died of tularemia. There are unsubstantiated reports of a number of other dead rabbits in the same vicinity; these have not been tested but should be presumed to have died of the same disease. Tularemia, whether in rabbits, ticks or humans, is not commonly reported in Ventura County. Tularemia is highly infectious. It may be transmitted to humans by handling or eating infected animals, tick bites, inhaling contaminated dust or contaminated water droplets. Ventura County providers should be on the alert for patients with signs and symptoms compatible with tularemia.

Etiologic Agent

Tularemia is caused by an infection with *Francisella tularensis*, a small, Gram-negative coccobacillus. It is commonly associated with rabbits and rodents, and can infect other wildlife species, as well.

Clinical Description

Symptoms vary depending on the route of introduction. **Fever, chills, sweats, rigors, headache, myalgia and gastrointestinal symptoms** are commonly reported by patients. **Lymphadenopathy is common** but not always present. If the bacteria are introduced through a percutaneous breach such as a tick bite, a cut on the hand, or a vegetation stick, the patient may develop an **ulcer** at that site and may or may not develop accompanying **swelling in the lymph nodes** (*ulceroglandular*) draining the injury area. Ulcers are typically slow-developing; affected skin sites may also show **pustules and blisters**. If tularemia bacteria are inhaled, ***pneumonia*** can ensue. Patients may either inhale or ingest the bacteria in dusts generated during gardening, landscaping and lawn care activities. Bacteria can also be consumed in undercooked game meat and by drinking contaminated untreated surface waters, resulting in *typhoidal* or *oropharyngeal* tularemia. Those who ingest the bacteria may report a **sore throat, abdominal pain, diarrhea and vomiting**. Other clinical presentations include ***oculoglandular*** infections possibly from touching the face or eyes with contaminated hands. **Sepsis** without localizing signs is referred to as typhoidal tularemia. These patients may also report sore throat and gastrointestinal symptoms. *Glandular* tularemia can present as regional or general systemic lymphadenopathy, without a clear route of exposure.

The incubation period averages 3 to 5 days but ranges from 1 to 21 days. Without treatment, fever may last for an average of 32 days.

Reservoirs

Hosts that become bacteremic and contribute to transmission cycles include a variety of wild animals such as rabbits, voles and mice. The American dog tick (*Dermacentor variabilis*), the Lone Star tick (*Amblyomma americanum*) and the Rocky Mountain wood tick (*Dermacentor andersoni*) can transmit tularemia by bite.

Modes of Transmission

Hard ticks, deer flies and horse flies can transmit tularemia by bite, usually causing ulceroglandular or glandular tularemia.

Hunters may be at risk of acquiring a tularemia infection when skinning, gutting or consuming game animals. Domestic cats are susceptible to tularemia and can transmit the bacteria to humans. Care should be taken when handling any sick or dead animal.

Humans can also acquire tularemia by inhaling dusts or aerosols contaminated with *F. tularensis* bacteria. This can occur during farming, gardening, yardwork or landscaping activities. This type of exposure can result in pneumonic tularemia, one of the more severe forms of the disease. Water can also become contaminated with the bacteria through contact with infected animal carcasses or excretions of infected animals. Humans who drink contaminated water that has not been treated may contract oropharyngeal tularemia.

The average infective dose for humans is estimated at 10 organisms by subcutaneous inoculation and 25 organisms by aerosol. Long-term immunity follows recovery. Reinfection is extremely rare but has been reported in laboratory staff. **Person-to-person transmission has never been reported**.

Symptoms usually appear 3–5 days after exposure to the bacteria, but illness onset can take as long as 14 days.

Human tularemia usually occurs in association with animal epizootics – rabbit tularemia outbreaks are easier to observe than rodent outbreaks, as rodents are smaller and diurnal/nocturnal.

Diagnosis

Confirmatory:

- Isolation of *F. tularensis* in a clinical or autopsy specimen, OR
- Fourfold or greater change in serum antibody titer to *F. tularensis* antigen between acute and convalescent specimens

Supportive:

- Elevated serum antibody titer(s) to *Francisella tularensis* antigen (without documented fourfold or greater change) in a patient with no history of tularemia vaccination, OR
- Detection of *F. tularensis* in a clinical or autopsy specimen by fluorescent assay
  -OR-
- Detection of *F. tularensis* in a clinical or autopsy specimen by a polymerase chain reaction (PCR)

Clinical diagnosis is supported by evidence or history of a tick or deerfly bite, exposure to tissues of a mammalian host of *F. tularensis*, including via an animal bite, or exposure to potentially contaminated water.

False-positive direct fluorescent antibody stain for Legionella on bronchoscopy specimens have been reported. Routine examination of sputum does not help to support the diagnosis. The disease may mimic tuberculosis. The death rate in untreated or incorrectly treated tularemia may reach 60%; with appropriate antibiotic therapy the death rate is 4% or less.

Disease Control Measures

Treatment

Streptomycin is the drug of choice. The minimum effective dose of streptomycin is 7.5 to 10 mg/kg I.M. q 12 hours for 7 to 14 days. An alternative regimen is 15 mg/kg I.M. q 12 hours for the first 3 days followed by half this dose to complete treatment. Very ill patients may receive a 15 mg/kg dose q 12 hours throughout a 7 to 10 day course. The maximum daily dose of streptomycin is 2 grams per day to avoid relapse.

Gentamicin is considered an acceptable alternative, but some series have reported a lower primary success rate.

Doxycycline should be given for at least 14 days to avoid relapse; it may be a suitable alternative to aminoglycosides for patients who are less severely ill. Ciprofloxacin and other fluoroquinolones are not FDA-approved for treatment of tularemia but have shown good efficacy in vitro, in animals, and in humans. [Reference: www.cdc.gov/tularemia/clinicians/index.html]

When hiking, camping or working outdoors:

- Use insect repellents containing 20% to 30% DEET, picaridin or IR3535.
- Wear long pants, long sleeves, and long socks to keep ticks and deer flies off your skin.
- Remove attached ticks promptly with fine-tipped tweezers.
- Don't drink untreated surface water.

When mowing or landscaping:

- Use of N95 masks during mowing and other landscaping activities may reduce your risk of inhaling the bacteria, but this has not been studied.
- Mowing or doing yardwork in areas where animals have died of tularemia may pose a risk even if carcasses are not present.
- Don't mow over sick or dead animals. When possible, check the area for carcasses prior to mowing and remove them.

When hunting, trapping or skinning animals:

- Use gloves when handling animals, especially rabbits, muskrats, prairie dogs and other rodents.
- Cook game meat thoroughly before eating it.

This bulletin is intended to improve the public health in our county by keeping physicians and nurses informed of noteworthy diagnoses, disease trends and other events of medical interest. Another goal of a public health department is to educate. We hope that you will use this information to increase your awareness. Please allow us to continue in our role of speaking to the press so that we may maximize the educational message to the benefit of all citizens of Ventura County.

Communicable Disease Office
2220 E. Gonzales Rd Suite 110, Oxnard, California 93036 • (805) 981-5201 • FAX (805) 981-5200