TULAREMIA:
INFORMATION FOR HEALTH CARE PROFESSIONALS

Definition

- Tularemia (also known as rabbit fever) is the infectious disease caused by the bacterium *Francisella tularensis*, a small aerobic gram-negative coccobacillus. It is a relatively hardy organism that survives well in cold wet conditions.
- There are two major subspecies, or biovars:
    - Type A, responsible for most of the cases in North America, is highly infectious and virulent.
    - Type B, which is more prevalent in Europe and Asia, causes milder disease.
- Tularemia is almost purely a zoonotic disease acquired typically from wild animals.

Epidemiology

- The natural reservoir for *Francisella tularensis* is small and medium sized mammals, including rabbits, hares, muskrat and rodents. It is known to be present throughout Canada and the United States.
- Humans, typical domestic animals such as dogs, cats, and cattle and some species of birds, fish and amphibians are incidental hosts.
- Tularemia is a rare to uncommon disease in Manitoba. Only 6 human cases since 1994 have been detected. None were associated with outbreaks and none resulted in fatality. Animal tularemia is not reportable in Manitoba, so animal statistics are unavailable for comparison.
- There is no known person to person transmission of tularemia.
- The infectious dose is low; inoculation or inhalation of 10 to 50 organisms can result in disease.
- Infection may be introduced by:
    - The bite of an infected arthropod vector (e.g. ticks, biting flies, etc.).
    - Handling infectious animals, carcasses, tissues or their fluids.
    - Direct contact with or ingestion of contaminated water or food.
    - Inhalation of infectious aerosols.
- The human incubation period is 1 to 14 days, most commonly 3 to 5 days.

Clinical Presentation

- Non-specific constitutional symptoms can occur with any form of tularemia. These usually start abruptly and may include: fever, chills, malaise, fatigue, myalgia, arthralgia, headache and sore throat. Constitutional symptoms may resolve by the time cases present for medical care. Secondary rashes such as erythema nodosum, erythema multiforme and urticaria may accompany tularemia.
- Case fatality rate is less than 5% with treatment.
- Tularemia can be asymptomatic, but has six classical presentations:

Ulceroglandular Tularemia

- Most commonly occurring form (75-85% of cases).
- A tender erythematous papule develops at the site of inoculation. Constitutional symptoms appear simultaneously or shortly thereafter.
- The papule enlarges over the next 1-2 days to become an indurated vesicular lesion that ulcerates. An eschar may develop.
- Tender regional lymphadenopathy develops with the lesion.

Glandular Tularemia

- Presents the same as Ulceroglandular tularemia, but without the ulcer.

Oculoglandular Tularemia

- Occurs infrequently (1-5% of cases).
- Usually as a result of conjunctival inoculation from contaminated hands or infectious splashes.
- Usually unilateral disease with chemosis, injection, pain, excessive lacrimation and tender ipsilateral lymphadenopathy. Small conjunctival ulcers may be seen.

Oropharyngeal Tularemia

- Also uncommon (1-10% of cases)
- Presents as severe throat pain with exudative pharyngitis/conjunctivitis that is unresponsive to penicillin. Tender regional lymphadenopathy is common.

Typhoidal Tularemia

- Presents as a febrile systemic illness without anatomic localization of infection.
- Constitutional symptoms, non-bloody diarrhea, vomiting and abdominal pain are prominent.
- Sepsis, pneumonia, renal failure, rhabdomyolysis and other hematogenously spread end organ disease are all possible.

Pneumonic Tularemia

- Results from inhalation or hematogenous spread to lungs.
- Presents as abrupt onset of respiratory symptoms with a non-productive cough, pleurisy and dyspnea.
- May be sever and rapidly progressive or indolent with progressive weakness and weight loss over several weeks to months.

Diagnosis

- Culture of sputum or respiratory secretions during pneumonia, blood cultures during any type of illness and swabs from ulcerative or ocular infections are recommended.
- Notify the lab that *Francisella tularensis* is suspected. Labs must report isolation of *Francisella tularensis* to Public Health, and forward the isolate to Cadham Provincial Laboratory for confirmation. Laboratories are reminded that *F. tularensis* is a BSL-3 organism, and should be appropriately handled.
- Chest radiography may be minimal early in disease but can progress to show cavitation, empyemas, ARDS and hilar adenopathy.

- Regardless of illness type, serology is indicated. Antibodies appear in the first week of illness, but in low titre. Acute and convalescent serum collected 10-14 days apart will be required to demonstrate a 4-fold diagnostic rise in tularemia antibodies. Send 10 cc serum samples for tularemia to Cadham Provincial Laboratory.

Infection Control

- Person to person spread has not been documented. Routine practices are recommended.

Treatment

- Streptomycin or gentamicin are considered first-line therapy unless contraindicated. The duration of therapy is 10-14 days. Other drugs are available with varying degrees of efficacy. Consultation with Infectious Diseases is recommended for ill cases of tularemia.

Prognosis

- Untreated tularemia can be fraught with many complications. Suppurative lymphadenopathy is most common, but end organ disease such as renal failure, hepatitis, pericarditis, osteomyelitis, meningitis, etc. are all possible.
- Type A tularemia causes more severe disease and untreated can have mortality as high as 30%, but with treatment is less than 2%.
- Type B tularemia is historically most common in Europe and Asia, with mortality rarely seen. It is not known how comparable North American type B tularemia is to Eurasian strains, but is expected to be similar.

Prophylaxis

- Prophylaxis is not generally recommended.
- There is no licensed vaccine in Canada.

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