



BASIC INFORMATION

WHAT IS TULAREMIA?

- Tularemia is a severe zoonotic disease (a disease transmissible from animals to humans), caused by the bacterium called *Francisella tularensis*
- The illness is transmitted from animal to human by an insect bite, typically a bite from an infected tick or deer fly
- Tularemia is also known as
 - Rabbit fever
 - Pahvant valley plague
 - Ohara's fever
 - Deer fly fever
- Tularemia is a reportable disease in the U.S.
- *Francisella tularensis* is also an important bacterial warfare agent as it can be used as a biological weapon

WHAT ARE COMMON SIGNS AND SYMPTOMS?

- Clinical manifestations vary from being mildly symptomatic to shock or even death
- There are different forms of tularemia and each present in clinically different ways
 - Ulceroglandular form
 - This is the most common form of tularemia
 - Patients present with fever, an insect bite mark on their skin, with redness surrounding the bite mark (eschar), and lymph node enlargement in the regions near the bite mark
 - Occasionally, more than one eschar may be present
 - Skin lesions developing on the arms are likely due to animal handling
 - Skin lesions developing on the neck, torso, legs or crotch area are likely due to tick exposure
 - Glandular form
 - Patients will exhibit lymph node enlargement in the region near the entry point but there is typically no open wound that is noticeable
 - There may or may not be fever
 - The enlarged lymph nodes may require surgical or needle drainage
 - Pneumonic form
 - When this results from direct inhalation of the infective organism, this is called primary pneumonic tularemia disease
 - When this results from hematogenous spread (carried by the blood) to the lungs, this is called secondary pneumonic tularemia disease
 - Secondary pneumonic tularemia most commonly occurs with ulceroglandular form and typhoidal form
 - Patients develop fever, weakness, headache, muscle pain, loss of appetite, shortness of breath, and cough with small amounts of sputum production
 - Over the course of a few days, the cough progresses to more pronounced sputum and patients develop chest pain due to the forceful coughing
 - Pleural fluid may develop further compromising the patient's respiratory efforts
 - Oropharyngeal form
 - This form is acquired after ingestion of contaminated water or food
 - Patients commonly present with fever, sore throat, cervical lymph node enlargement, and possibly ulcer development on the tonsils
 - Typhoidal form
 - Patients with typhoidal form typically have other chronic medical conditions
 - Patients will commonly present with an acute illness displaying fever, headaches, chills, but without any localizing signs (e.g., eschar, lymph node enlargement)
 - Some of these patients may manifest in long-term illness with liver and spleen enlargement
 - Nearly half of these patients will develop pneumonic form disease

WHAT CAUSES TULAREMIA?

- Tularemia is caused by *Francisella tularensis*, which is categorized as a pleomorphic bacillus

- Rabbits, hares and rodents are very susceptible and die in large numbers during tularemia outbreaks

WHAT INCREASES MY RISK?

- Methods of transmission include
 - Inhalation
 - Ingestion of contaminated water
 - Skin contact with, or bite from, infected animal

WHAT ARE POSSIBLE COMPLICATIONS?

- Kidney failure
- Liver failure
- Rhabdomyolysis
 - Defined as muscle breakdown that releases potentially damaging proteins into the blood; may cause kidney damage
- Meningitis
- Endocarditis
- Joint infection
- Septic shock
 - Defined as a body-wide infection leading to life-threatening low blood pressure
- Immune compromised patients are at an increased risk for treatment failure and end organ damage

WHAT CAN I EXPECT?

- Tularemia is a potentially lethal disease
- Treatment is available, some patients may require hospital admission
- Treatment failure rates are high among patients with a compromised immune system

HOW DO I REDUCE MY RISK?

- Avoid handling animals with bare hands
- Avoid sick or dead animals
- Use insect repellants
- Remove ticks promptly once they are detected
- When camping, only consume bottled water and adequately cook wild meats
- There is no vaccine available
- Human-to-human transmission is not known to occur

DIAGNOSIS AND TREATMENT

WHAT GENERAL MEASURES SHOULD I TAKE?

- Your health care provider will complete a physical exam and collect information regarding your signs and symptoms
- Additional tests may be needed to confirm the diagnosis and to rule out other conditions that may present similarly
- Self-care
 - Maintain good hand hygiene
 - Keep all follow-up appointments
 - Take prescription medications as directed; treatment duration can take as long as 21 days in some cases
- Activity
 - Physical activity guidelines have not been established for this condition
- Diet
 - Dietary guidelines have not been established for this condition
- Helpful link
 - To learn more: Centers for Disease Control and Prevention - Tularemia
 - Website: <http://www.cdc.gov/tularemia/>
 - Phone: (800) 232-4636

WHAT ARE COMMON LABS AND TESTS?

- Routine, nonspecific, laboratory tests may be ordered depending on the severity of the case, such as
 - Complete blood count (CBC)
 - Electrolyte panel
 - Liver function test
 - Kidney function test
 - Urinalysis
- Other laboratory and/or imaging tests may be needed depending on the form of tularemia and the patient's medical history

WHAT ARE MY TREATMENT OPTIONS?

- Antibiotic therapy is the mainstay of treatment
- Inpatient hospital treatment may be needed in some cases
- Surgery, in addition to antibiotic therapy, may be needed in cases of severe lymph node involvement

WHAT MEDICATIONS MAY BE PRESCRIBED?

- An aminoglycoside may be prescribed to treat tularemia
 - A group of antibiotics that block bacterial protein production; particularly effective against certain types of bacteria
- Fluoroquinolones may be necessary for patients with a compromised immune system
 - A group of antibiotics that directly block DNA production; effective against a broad-range of bacteria

WHAT CAUTIONS SHOULD I TAKE?

- When outdoors, hiking, or working in the yard, use insect repellent and cover skin adequately using long sleeved shirts and long socks
- Drink only bottled water and properly cook wild meats when camping/hunting

WHEN SHOULD I SEEK MEDICAL HELP?

- Seek medical attention if there has been exposure to tick-infested areas, and signs and symptoms of tularemia develop
- Seek medical attention if symptoms worsen or do not improve after treatment

MY HEALTHCARE PROVIDER'S COMMENTS

REFERENCES

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