

Tick-Borne Illnesses in the United States



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KEYWORDS

• Tick • Lyme • Babesiosis • Tularemia • Rick-borne • Ehrlichiosis • Anaplasmosis

KEY POINTS

- During febrile episodes in tick-borne relapsing fever, cerebrospinal fluid, bone marrow, or blood may have detectable spirochetes.
- Saddleback fever is the pathognomonic feature of Colorado tick fever, occurring in about 50% of patients.
- Most *Babesia* sp infections are subclinical, self-limiting, and spontaneously resolve.
- Because *Francisella tularensis* is highly infectious, it is dangerous to isolate it from sputum, lymph nodes, or skin lesions, and providers should promptly alert their laboratory of the suspicion.
- The enzyme-linked immunosorbent assay (ELISA) test is about 72% specific for Lyme and 89% sensitive; the Lyme western blot test is used to confirm a positive ELISA test.

INTRODUCTION

Close interaction with nature often leads to tick-borne infections. These cases are seen most frequently in primary care clinics when patients present symptoms. Considerable morbidity can result from untreated infections. Fortunately, they are often easily treatable when diagnosed early.

TICK-BORNE RELAPSING FEVER

History and Physical Examination

Fever is intermittent and typically greater than 40°C. Delirium may or may not be present. Signs and symptoms begin a week after tick bite. Nausea, vomiting, arthralgias, fever, chills, night sweats, and generalized malaise are usually apparent, thus, a “flulike” illness. Meningeal signs and splenomegaly may also be apparent. Splenic rupture,

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myocarditis, pneumonitis, cranial nerve palsy, coma, iridocyclitis, hemoptysis, and epistaxis may also occur.^{1,2}

Pathogen

The spirochete *Borrelia hermsii* is one causative agent for tick-borne relapsing fever. The chief vectors are ticks of the *Ornithodoros* genus. Hares, rabbits, squirrels, chipmunks, mice, and rats may serve as reservoirs. Mountainous areas west of the Mississippi River see most cases. The disease is sporadic and may appear in familial clusters.³ Other *Borrelia* species, such as *Borrelia mayonii*, which may be found in Wisconsin and Minnesota, may cause more spirochetemia, leading to more pronounced symptoms.⁴

Diagnosis

During febrile episodes, cerebrospinal fluid, bone marrow, or blood may have detectable spirochetes. Thrombocytopenia, with or without leukocytosis, may also be noted.¹

Management

Doxycycline is the treatment of choice, with erythromycin as a viable alternative.^{5,6} If given during the late febrile stage, a Jarisch-Herxheimer reaction, characterized by seizures, rigors, sweating, fever, headache, and generalized malaise, may occur. Giving acetaminophen 2 hours before and after antibiotics may lessen the reaction's severity. Nonsteroidal anti-inflammatory drugs or steroids do not ameliorate the reaction's cardiopulmonary disturbances.

COLORADO TICK FEVER

History and Physical Examination

Colorado tick fever, also known as mountain tick fever, is caused by the Colorado tick fever virus. It is most commonly transmitted to humans by the bite of an infected adult wood tick. More than 90% of cases in the United States are from Colorado, Utah, and Montana. It is most prevalent during the summer months and is limited to mountainous elevations below 3000 m. Diagnosis can be challenging. Typically, within 1 week (usually 3–6 days) after the tick bite, the patient begins exhibiting flulike symptoms. Sore throat occurs in a third of patients. Other manifestations include chills, headache, musculoskeletal pain, and malaise. Saddleback fever is a pathognomonic feature; however, this occurs in only about 50% of patients. This biphasic fever lasts for about 3 days, followed by defervescence for 1 to 3 days, and concludes with a reappearance of the fever for another few days. A petechial, spotted rash can occur in up to a 10th of patients. The illness ranges from mild to life-threatening.

Pathogen

The wood tick, *Dermacentor andersoni*, transmits the RNA orbivirus that causes Colorado tick fever. The Rocky Mountain region sees the most cases annually, and incidence is probably higher than most reported numbers because initial presentation is generally benign.⁷ Severe complications may occur in immunocompromised or asplenic patients.

Diagnosis

Thrombocytopenia and leukopenia may be present.¹ Immunofluorescence reveals the presence of the virus in blood smears. Polymerase chain reaction (PCR) is needed to confirm the diagnosis.

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