Tick-Borne Diseases

Traveler Summary

This article discusses babesiosis, anaplasmosis, and ehrlichiosis. For information on other tick-borne diseases of importance to travelers, see *Rickettsial Infections*, *Lyme Disease*, and *Tick-Borne Encephalitis*.

Introduction

Ticks can carry a number of pathogens, including the parasite that causes babesiosis and the bacteria that cause anaplasmosis and ehrlichiosis. These diseases are usually acquired in rural settings during late spring and summer.

Transmission

These diseases are transmitted through tick bites. Ticks become infected when biting infected animals (such as mice or deer) and then transmit the disease to humans through infected saliva that enters the skin when the tick bites. Babesiosis can also be transmitted through blood transfusions and from a pregnant woman to her unborn child.

Risk Areas

Babesiosis

North America: In the U.S., there are 3 regions of high babesiosis activity: the area from Maine to Maryland on the East Coast, Wisconsin and Minnesota in the Midwest, and northern California and Oregon on the West Coast. The center of the country exhibits little or no risk of transmission. Sporadic cases have been reported in Canada.

Europe and Asia: Babesiosis is distributed throughout forested areas in Europe and Asia. In Europe, cases are reported in Ireland, the U.K., France, Germany, Austria, Belgium, Finland, and Italy. In Asia, cases are reported from Japan, Taiwan, China, and South Korea.

Anaplasmosis

North America: In the U.S., there are 3 regions of high anaplasmosis activity: the area from Maine to Maryland on the East Coast, Wisconsin and Minnesota in the Midwest, and northern California and Oregon on the West Coast. The center of the country exhibits little or no risk of transmission. In Canada, anaplasmosis is rarely reported in humans.

Europe and Asia: Cases of anaplasmosis have been reported in Austria, Italy, Latvia, the Netherlands, Norway, Poland, Slovenia, Spain, France, Russia, and Sweden. A few cases have been reported in China.

Ehrlichiosis

North America: In the U.S., the high transmission regions are the southeastern and south-central states, with highest reported rates from Mississippi, Oklahoma, Tennessee, Arkansas, and Maryland. Cases of ehrlichiosis have not been reported in Canada.

Worldwide: Ehrlichiosis is reported from several countries in Europe and Africa, as well as Mexico, Venezuela, Brazil, Chile, South Korea, China, Croatia, Poland, Greece, and Italy.

Risk Factors

Travelers at high risk for acquiring tick-borne diseases are those who engage in outdoor activities (such as hiking and camping in forested or brushy areas, or gardening near such areas) where tick reservoirs abound.

Conditions that increase risk for severe disease include older age, asplenia, immunosuppression, and hepatic or renal disorders.

Symptoms

Babesiosis

Symptoms may be flu-like, including fever, chills, sweats, headache, muscle aches, loss of appetite, nausea, and fatigue. More

severe illness may lead to multi-organ failure and death. Some persons have no symptoms. Most cases occur in older adults.

Anaplasmosis

Symptoms may include fever, chills, headache, muscle aches, malaise, nausea, abdominal pain, cough, confusion, and, rarely, rash. Severe illness may include respiratory distress, hemorrhage, renal failure, or neurological complications. Most cases occur in older adults.

Ehrlichiosis

Symptoms may include fever, chills, headache, malaise, muscle aches, nausea/vomiting/diarrhea, confusion, conjunctival injection (red eyes), and rash. Severe cases can be life threatening. Most cases occur in older adults.

Prevention

Tick avoidance is the best strategy to prevent babesiosis, anaplasmosis, and ehrlichiosis.

People living in or entering tick-infested areas should:

- Wear long, light-colored pants tucked into socks.
- Use a DEET insect repellent on skin and an insect repellent containing permethrin on clothes.
- Check for ticks daily, especially on the neck, scalp, groin, armpits, and belly-button.
  - Repeat the inspection daily and for a few days after leaving the area.
  - Pets should also be inspected, especially in the ears.
- Remove attached ticks immediately with fine-tipped tweezers, grasping the tick as close to the skin surface as possible and pulling directly upwards, steadily, without twisting or jerking.
  - Clean the site with an alcohol swab or soap and water.
  - Avoid handling the tick with bare hands.
  - Save tick in a glass container for later identification.
- If possible, hikers should stay on well-cleared trails when crossing wooded areas.

These precautions reduce but do not eliminate the risk.

Need for Medical Assistance

After a tick bite in risk areas, travelers with the symptoms noted above should seek medical attention, especially if they are asplenic, elderly, or immunosuppressed.

Disease	Tick	High risk areas	Symptoms
Babesiosis	- Northeastern U.S. and upper Midwest: blacklegged tick or deer tick - U.S. Pacific Northwest: western blacklegged tick - Europe: castor bean tick - Asia: *Ixodes persulcatus*	U.S. (Northeast, upper Midwest); Europe (Ireland, U.K., France, Austria, Italy, Germany, Belgium, Finland); Asia (Japan, Taiwan, China, South Korea)	Fever, chills, sweats, headache, muscle aches, loss of appetite, nausea, fatigue
Anaplasmosis	- Northeastern U.S. and upper Midwest: blacklegged tick or deer tick - U.S. Pacific Northwest: western blacklegged tick - Europe: *Ixodes ricinus* - Asia: *Ixodes persulcatus*	U.S. (Northeast, upper Midwest); Europe (Slovenia, Sweden); Asia (China, Siberian Russia, Korea)	Fever, chills, headache, muscle aches, nausea, abdominal pain, cough, confusion; rarely rash
Ehrlichiosis	U.S.: Lone star tick	U.S. (eastern and south-central); Mexico; South America; Europe (widespread); Asia (China); and possibly Africa	Fever, chills, headache, muscle aches, nausea, vomiting, diarrhea, confusion, red eyes, rash