

Ehrlichiosis

Ehrlichiosis is caused by various bacteria in the genera *Ehrlichia* and *Anaplasma*. Two main forms of ehrlichiosis are currently recognized in the US. Human granulocytic ehrlichiosis (HGE) – soon to be known as human anaplasmosis – is transmitted by the deer tick in the northeastern and upper mid-western states. As the blacklegged or deer tick also is responsible for Lyme disease infections, most cases of HGE are reported in the areas where Lyme disease is endemic. Human monocytic ehrlichiosis (HME) is transmitted by the lone star tick and is seen primarily in the southeastern and south central states.

Ehrlichiosis Signs and Symptoms

Symptoms are flu-like: fever, chills, malaise, headache, muscle and joint pain, nausea and vomiting. Symptoms usually occur 5-10 days after the tick bite. Most patients show a decrease in white blood cell count and platelets, and elevated liver enzymes. Physicians should consider ehrlichiosis in the diagnosis of a patient with flu-like symptoms with these alternations in blood values, particularly if exposure to ticks is possible.

Recommended Testing Procedures

Ehrlichiosis may be diagnosed by observing the organism in white blood cells, culturing the organism, or by detecting the organism's DNA by special laboratory methods. Antibody tests may be used to detect antibodies to *Ehrlichia*.

Treatment

Tick-borne infections respond well to treatment, particularly when diagnosed early, accurately, and treated promptly. Antibiotics are very effective in the treatment of Lyme disease and ehrlichiosis. A combination of drugs is used in the treatment of babesiosis.

Presently, there are no vaccines available for human use to provide immunity to tick-borne illnesses.

Personal protection practices and property management to control ticks are the most significant weapons available to prevent tick bite and risk of disease.

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TARGET LYME DISEASE



EMERGING TICK- BORNE DISEASES: A Growing Public Health Threat



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Tick-borne Diseases

While Lyme disease is the best known, and most wide-spread, tick-borne disease in Connecticut, it is not the only disease that can be transmitted by the bite of the deer tick. Babesiosis and ehrlichiosis are other diseases that are emerging as public health threats in Connecticut.

To make matters worse, it is possible to be co-infected by two or more tick-borne



diseases at the same time. It has been demonstrated that 10-15% of patients with Lyme disease are co-infected with another tick-borne illness and may exhibit more profound symptoms than from either disease alone. In such cases, accurate diagnosis is a significant element of treatment success.

Ticks pose an increasing threat to humans and domestic animals. As obligate blood-feeders, ticks must feed on an animal host in order to survive and reproduce. While most ticks limit their feeding to specific animals, several (approximately 12 of the 78 US species) are less selective and attack people, pets and livestock. Ticks may harbor pathogenic organisms that they can transmit to humans or animals when they feed. These organisms can cause mild to severe illnesses, particularly in the very young, the elderly and the immunosuppressed.

Lyme Disease

Lyme disease is caused by the spirochete bacterium *Borrelia burgdorferi* and transmitted by the bite of the blacklegged or deer tick, *Ixodes scapularis*. Lyme disease is the most common vector-borne disease in the United States. Most cases occur in the late spring and early summer when the nymphal stage of the tick is active. The highest incidence of Lyme disease in Connecticut is seen in young children, as their play activities often place them at risk. Certain occupational and recreational activities increase the risk in adults as well.

Lyme Disease Signs and Symptoms

Most people develop a red rash, called erythema migrans (EM), within 3-21 days of a tick bite. The painless rash gradually expands, often reaching 5 centimeters or more in diameter, and disappears without treatment. The presence of an EM rash larger than a quarter in diameter usually confirms a diagnosis of Lyme disease.

Other common symptoms are flu-like, including fatigue, muscle and joint pain, fever, headache, chills and stiff neck. Fever is usually low-grade. Co-infection should be considered if one's temperature remains high.

Recommended Testing Procedures

Clinical diagnosis is based primarily on signs and symptoms supported or confirmed by laboratory tests. A two-step antibody test is the recommended laboratory test. The ELISA (Enzyme-linked immunosorbent assay) is used to test for antibodies to *B. burgdorferi*. The Western blot is then used to confirm positive or equivocal results from the ELISA.

Babesiosis

Babesiosis is caused by the protozoan parasite *Babesia microti*. It invades red blood cells and causes malaria-like symptoms 1-9 weeks after exposure. The disease most severely affects those over 50 and the immunocompromised, especially those who have had their spleen removed. Babesiosis generally produces only mild to moderate flu-like symptoms in healthy children and adults. As with Lyme disease, babesiosis is most likely to be transmitted by the nymphal stage of the tick in late spring and early summer.

Babesiosis Signs and Symptoms

A gradual onset of malaise, loss of appetite, and fatigue typically occur, followed by intermittent fever with temperatures as high as 104 degrees F. Usually one or more of the following occur: shaking chills, sweats, headache, muscle aches and anemia.

Physicians should consider babesiosis in a person presenting with a high fever and anemia, particularly in spring and early summer.

Patients with babesiosis may be co-infected with Lyme disease, and/or ehrlichiosis, and experience more severe symptoms for a longer duration than with those with either disease alone.

Recommended Testing Procedures

Babesiosis is diagnosed by microscopic identification of the organism inside red blood cells on stained blood smears. Antibody tests also may be used to detect antibodies to *Babesia*. Polymerase chain reaction (PCR) and antibody tests also may be used to detect antibodies to *Babesia* but require qualified laboratories for reliable results.