

Lyme Disease... Some Facts

Lyme disease is a tick-carried illness. It was first noticed as a problem during 1975 when the parents of several children near Lyme, Connecticut became alarmed because they thought their children acquired arthritis. While ticks were believed to carry the disease, it was not until 1982 that the cause of Lyme disease was discovered.

The Cause of Lyme Disease

Lyme disease is an infection caused by *Borrelia burgdorferi*, a corkscrew-shaped bacterium called a spirochete.

Where Lyme Disease Occurs

Lyme disease has been found in most states and many foreign countries. In the United States it is now the most frequently reported disease carried by ticks. It is most common in the northeast (Massachusetts, Connecticut, New York and New Jersey) where thousands of cases may occur each summer. Many cases also occur in Wisconsin and Minnesota. However, Lyme disease has not been as common in the southern states. In North Carolina, less than 100 cases are found each year. Rocky Mountain spotted fever, another tick-carried disease, is still more common than Lyme disease in North Carolina.

Lyme Disease Transmission

Lyme disease is spread by the bite of ticks of the genus *Ixodes* (deer tick) that are infected with *Borrelia burgdorferi*.

Research indicates that, for the most part, ticks transmit Lyme disease to humans during the nymph stage, probably because nymphs are most likely to feed on a person and are rarely noticed because of their small size (less than 2 mm). Thus, the nymphs typically have ample time to feed and transmit the infection (ticks are most likely to transmit infection after approximately 2 or more days of feeding).

Adult ticks can transmit the disease, but since they are larger and more likely to be removed from a person's body within a few hours, they are less likely than the nymphs to have sufficient time to transmit the infection. Moreover, adult *Ixodes* ticks are most active during the cooler months of the year, when outdoor activity is limited.

Ticks search for host animals from the tips of grasses and shrubs (not from trees) and transfer to animals or persons that brush against vegetation. Ticks only crawl; they do not fly or jump. Ticks found on the scalp usually have crawled there from lower parts of the body. Ticks feed on blood by inserting their mouth parts (not their whole bodies) into the skin of a host animal. They are slow feeders: a complete blood meal can take several days. As they feed, their bodies slowly enlarge.

Although in theory Lyme disease could spread through blood transfusions or other contact with infected blood or urine, no such transmission has been documented. There is no evidence that a person can get Lyme disease from the air, food or water, from sexual contact or directly from wild or domestic animals. There is no convincing evidence that insects such as mosquitoes, flies, or fleas can transmit Lyme disease.

Campers, hikers, outdoor workers, and others who frequent wooded, brushy, and grassy places are commonly exposed to ticks, and this may be important in the transmission of Lyme disease in some areas. The risk of exposure to ticks is greatest in the woods and garden fringe areas of properties, but ticks may also be carried by animals into lawns and gardens.

Symptoms of Lyme Disease

Lyme disease, like other tick-carried diseases, is most likely to occur in the warm weather months. Because the bacteria can attack so many parts of the body, Lyme disease has been confused with other ailments. The symptoms change with time and can last for years.

Early Lyme Disease: One or more of the following symptoms and signs usually mark the early stage of Lyme disease:

- fatigue

- chills and fever
- headache
- muscle and joint pain
- swollen lymph nodes
- a characteristic skin rash, called erythema migrans

Erythema migrans is a red circular patch that appears usually 3 days to 1 month after the bite of an infected tick at the site of the bite. The patch then expands, often to a large size. Sometimes many patches appear, varying in shape, depending on their location. Common sites are the thigh, groin, trunk, and the armpits. The center of the rash may clear as it enlarges, resulting in a bulls-eye appearance. The rash may be warm, but it usually is not painful. Not all rashes that occur at the site of a tick bite are due to Lyme disease, however. For example, an allergic reaction to tick saliva often occurs at the site of a tick bite. The resulting rash can be confused with the rash of Lyme disease. Allergic reactions to tick saliva usually occur within hours to a few days after the tick bite, usually do not expand, and disappear within a few days.

Late Lyme Disease: Some symptoms and signs of Lyme disease may not appear until weeks, months, or years after a tick bite:

- Arthritis is most likely to appear as brief bouts of pain and swelling, usually in one or more large joints, especially the knees.
- Nervous system abnormalities can include numbness, pain, Bell's palsy (paralysis of the facial muscles, usually on one side), and meningitis (fever, stiff neck, and severe headache).
- Less frequently, irregularities of the heart rhythm occur.
- In some persons the rash never forms; in some, the first and only sign of Lyme disease is arthritis, and in others, nervous system problems are the only evidence of Lyme disease.

Treatment

Lyme disease is treated with antibiotics under the supervision of a physician. Several antibiotics are effective. Antibiotics usually are given by mouth but may be given intravenously in more severe cases. Patients treated in the early stages with antibiotics usually recover rapidly and completely. Most patients who are treated in later stages of the disease also respond well to antibiotics. Varying degrees of permanent damage to joints or the nervous system can develop in patients with late chronic Lyme disease. Typically these are patients in whom Lyme disease was unrecognized in the early stages or for whom the initial treatment was unsuccessful. Rare deaths from Lyme disease have been reported.

Personal Protection from Tick Bites

The chances of being bitten by a tick can be decreased with a few precautions:

- Avoid tick-infested areas, especially in May, June, and July.
- Wear light-colored clothing so that ticks can be spotted more easily.
- Tuck pant legs into socks or boots and shirt into pants.
- Tape the area where pants and socks meet so that ticks cannot crawl under clothing.
- Spray insect repellent containing DEET on clothes and on exposed skin other than the face, or treat clothes (especially pants, socks, and shoes) with permethrin, which kills ticks on contact.
- Wear a hat and a long-sleeved shirt for added protection.
- Walk in the center of trails to avoid overhanging grass and brush.

During your time outdoors, keep away from tall grass and dense woods. These are two favorite hangouts for ticks. Any time you spend in tall grass or deep woods - whether you are hiking, bicycling, golfing, camping, picnicking etc. - can expose you to a tick.

After being outdoors, inspect for ticks. Check places where ticks might be hard to spot, including your back, scalp, and genitals. Check your pet for ticks. If you do find a tick, remove it promptly and carefully. Use tweezers to grasp the tick by its head. Try to remove the whole tick without crushing it. If possible, seal the tick in a plastic bag and take it along if you see your physician. Otherwise flush the tick down the toilet or bury it. Wash your hands after handling ticks.

Lyme Disease Vaccine

The U.S. Food and Drug Administration has recently approved LYMERix as a Lyme disease vaccine. The LYMERix vaccination process requires a 3-dose vaccine given on a 0, 1, and 12-month schedule. Patients must complete all 3 doses for optimal protection. It is effective for people 15 through 70 years of age.

People interested in the Lyme disease vaccine should talk to their doctors about getting vaccinated. Time during the vaccination process is required in order to build immunity to Lyme disease. LYMERix is available in prescription form from your personal doctor.

All costs associated with the Lyme disease vaccine are the responsibility of the employee. However, some health insurance programs will cover these costs if prescribed by the treating physician. Check with your insurance carrier.

Sources:

1. NC Department of Environment and Natural Resources, Division of Environmental Health, Lyme Disease Brochure, 1998.
2. Mayo Clinic, Lyme Disease Bulletin, 1998.
3. Lyme Disease Public Information Guide, Center for Disease Control and Prevention, D. Harrell, 1998.