

## Lyme Disease

Lyme disease is a bacterial infection spread by tick bites from infected blacklegged ticks. The bacteria that causes the disease is *Borrelia burgdorferi*, a spirochete. The earliest symptoms are chills, fever, itching all over the body, general malaise, muscle pain, stiff neck, light-headedness, fainting and/or headache. There may also be a characteristic rash called erythema migrans or a 'bull's eye' rash. This appears in most cases but not all. Lyme disease is hazardous and precarious due to the intermittent symptoms presenting with the disease which can make it difficult to correctly diagnose.<sup>1</sup>

A common complication of Lyme disease is myocarditis, an inflammation of the myocardium. Lyme disease-bearing ticks usually reside in, among other places, northeastern U.S. states, which includes Long Island. The Empire State Lyme Disease Association reports that New York has one of the highest incidences of Lyme Disease in the U.S. They also say that Lyme disease can be misdiagnosed as many other illnesses so it is important to be aware of the signs and symptoms in order to reach the proper diagnosis. The association distributes informative pamphlets which assert that standard treatment (30 days on antibiotics) may not be enough and that patients may develop chronic Lyme disease if the primary treatment does not work. They go on to advocate that 1-4 years of antibiotic treatment may be better to completely eradicate the bacteria.<sup>2</sup> A lot of this information from the ESLDA comes from anecdotal and personal testimonials from acquaintances, friends and relatives who have had the disease and the various complications which have resulted from it.

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<sup>1</sup>"Lyme disease," 2011

<sup>2</sup>Empire State Lyme Disease Association, Inc, 2010

In recent years, scientists have been warning against excessive use of antibiotics. There has been a rise in antibiotic-resistant bacteria and it is largely due to adaptation from overexposure to antibiotics. There are also very serious side-effects from long-term and even short-term antibiotic use such as gastrointestinal imbalances due to effects upon good bacteria resulting in digestive issues. Eradicating minor infections may also create an ideal environment for opportunistic infections by even more dangerous and deadly bacteria. It should be made clear that prescription of antibiotics should be monitored very carefully and strictly limited to prevent unnecessary usage.<sup>3</sup>

Among those infected, children are the most susceptible. Lyme disease can spread throughout the body once contracted to the brain, heart and other organs. Once the infection reaches the heart, it can cause myocarditis. In order to avoid chronic symptoms, early detection is recommended. The ELISA test is usually used first, and confirmed with a western blot. Another more accurate but more expensive test is the PCR. Lyme disease is also a recognized cause of atrioventricular heart block. This can be reversed with antibiotic treatment in most cases. Myocarditis can be identified by irregularities in an EKG but the symptoms may be intermittent, which can make it difficult to identify. Concerning treatment, the ESLDA recommends that the antibiotic should be administered depending upon where the bacterium is.<sup>4</sup>

A connection has been found between Lyme disease and autism spectrum disorder in children (Lyme-Autism Connection & Long Island Autism Foundation). The LIAF asserts that it may be due to infection of the mother with the virus before birth. The infection is in the mother's blood and can travel through the placenta to the fetus, which weakens the

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<sup>3</sup>Harms, 2010

<sup>4</sup>Empire State Lyme Disease Association, Inc, 2010

immune system and this makes the body susceptible to further damage. For years, there has been controversy over whether or not vaccinations may contribute to or trigger autism. The issue is complicated because vaccinations are necessary preventive medicine tools that have saved many lives and dramatically lowered the incidence of many diseases, including polio and smallpox. The LIA says that in some cases, Lyme disease may have been contracted before birth and that if the child, now more vulnerable to disease, gets another infection, or if their immune system cannot handle a vaccination and it actually makes them sick, either by normal or autoimmune response, then this may cause further damage and result in Autism.<sup>5</sup> While this seems plausible, there is little evidence to support this claim. Positive Western Blot or ELISA tests are not always indicative of infection, which is what makes diagnosing Lyme disease so difficult. The data used to make these claims are not published in scientific peer-reviewed journals and there has been no independent objective verification. The tests themselves were done using non-standard criteria, at odds with recommendations by the CDC. This would result in many false positive tests so information from the LIAF seems to be unreliable in this regard.<sup>6</sup>

The LIAF also states that Lyme disease can be transmitted from person to person sexually, and by fleas, mosquitoes and bed bugs.<sup>7</sup> The CDC, however, says that there is no evidence that Lyme disease is vector-borne and only transmitted by certain species of ticks. The American Lyme Disease Foundation also says that there is no evidence of any other mode of transmission. The speculation that it may be transmitted sexually is due to the fact that both the syphilis bacteria and the Lyme disease bacteria are spirochetes. The ALDF

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<sup>5</sup>L.I.A. Foundation, 2011

<sup>6</sup>American Lyme Disease Foundation, 2011

<sup>7</sup>L.I.A. Foundation, 2011

reports that despite the similarities in structure, there is no clinical or epidemiological evidence to support the claim that it may be transmitted sexually. Also, due to the fact that biochemical processes present during tick feeding are not present during any sort of sexual activity, this mode of transmission is unlikely.<sup>8</sup>

The International Lyme and Associated Disease Society reports that late-stage Lyme disease can cause a myriad of psychiatric disorders. They say that when the bacteria infects the brain, it can mimic any kind of encephalopathy or psychiatric disorder. They advise that psychiatrists look for these symptoms (which would occur in almost all psychiatric inpatients) and consider treating them with antibiotics alongside psychiatric medications to completely alleviate symptoms. This may encourage the family members of these patients to pressure the psychiatrist into antibiotic therapy when the treatment may not even be necessary. This is another example of unnecessary antibiotic usage, the kind that breeds deadly resistant bacteria.<sup>9</sup> The ALDF, with regards to the neurological effects of Lyme disease, says that it causes a benign form of meningitis. There are very rare infections of the spinal cord, the brain or other nerves such as facial nerves (Bell's palsy) but it is only in 5% of untreated individuals. Also, it is extremely rare to see any permanent damage to the brain. Associated neurological effects, such as headaches and difficulties with concentration or memory, are due to the body's reaction to the infection by inflammation in the lining of the brain and as soon as the infection resolves, the symptoms should disappear.<sup>10</sup>

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<sup>8</sup>American Lyme Disease Foundation, 2011

<sup>9</sup>Sherr, Soloman, Bransfield & Schaller, 2010

<sup>10</sup>American Lyme Disease Foundation, 2011

The ESLDA maintains that Lyme disease is often misdiagnosed as many other diseases, including arthritis, lupus and fibromyalgia. This confusion may be due to the similarity of the symptoms including stiffness in the joints and back, along with joint pain or swelling, muscle pain or cramps, burning or stabbing sensations, or shooting pains, or twitching of the face or other muscles.<sup>11</sup> The Road Back Foundation has advocated using antibiotics to treat rheumatic disease, inflammatory arthritis, and connective tissue diseases such as scleroderma, lupus and fibromyalgia. They have reported the results of several studies indicating that this treatment has been effective.<sup>12</sup> Antibiotics may have been cogent treatments because these patients may have just suffered from misdiagnosed Lyme disease. Antibiotics kill bacteria so there is no logical reason why they should be effective against auto-immune disorders. Despite this, these arthritic symptoms may be inflammation in response to the viral or bacterial infection. In this case, if the bacteria which causes Lyme disease reaches the joints, it can cause reactive arthritis or Lyme disease related arthritis.<sup>13</sup><sup>14</sup>

Currently, the ESLDA advocates evaluation of Lyme disease on a case-by-case basis and this is understandable because a disease with so many symptoms and various presentations will appear to be different in different people. As is, more research needs to be done for more accurate testing and doctors, as well as patients, should try to rule out Lyme disease and avoid misdiagnosis. As with any disease, misdiagnosis can be deadly, such as treating an infection with immunity-suppressant medication.

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<sup>11</sup>Empire State Lyme Disease Association, Inc, 2010

<sup>12</sup>Road Back Foundation

<sup>13</sup>NIAMS, 2009

<sup>14</sup>American Academy of Orthopaedic Surgeons, 2011

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