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LYME ARTHRITIS

What is it?
Lyme arthritis is caused by a bacterium transmitted by tick bites.
While the skin, the central nervous system, the heart, the eye and other organs may be the target of infection, in Lyme arthritis, joints are the exclusive target in most cases. However, there may be a history of skin involvement in the form of erythema migrans, an expanding red skin rash at the site of the tick bite.
In rare instances, untreated cases of Lyme arthritis may progress to central nervous system involvement.

How common is it?
Only a minority of children with arthritis have Lyme Arthritis.
However, Lyme arthritis is probably the most frequent arthritis occurring after bacterial infection in children and adolescents in Europe. It rarely occurs before the age of four and is mainly a disease of school children.
It occurs in all areas of Europe. However, it is most prevalent in Middle Europe and southern Scandinavia around the Baltic Sea. Transmission depends on the bite of infected ticks active from April to October, but depending on environmental temperature and humidity, Lyme arthritis may start at any time during the year, due to the long and varying times between the tick-bite and the onset of joint swelling.

What are the causes of the disease?
The cause of the disease is the bacterium Borrelium burgdorferi transmitted via tick bites. Most ticks are not infected and most tick-bites do not result in infection. Most infections, if apparent as erythema migrans, do not progress to later stages of the disease, including Lyme arthritis.
This is the case especially if early stages, including erythema migrans, have been treated with antibiotics. Although Lyme borreliosis, in the form of erythema migrans, may occur in up to one in 1000 children each year, the occurrence of Lyme arthritis, the late manifestation of the disease, is a rare event.

Is it inherited?
Lyme arthritis is an infectious disease and not inherited. In addition, chronic Lyme arthritis has been associated with certain genetic markers, suggesting an inherited predisposition to developing the disease, but the precise mechanisms are not known.

Why has my child got this disease? Can it be prevented?
In European regions where ticks are roaming, it is difficult to prevent kids from acquiring a tick. However, most of the time, the causative organism Borrelia burgdorferi is not transmitted immediately after the tick-bite, but only several hours and up to one and a

half days later, when the bacterium has reached the salivary glands of the tick and is excreted with saliva into the host.
Ticks attach to their hosts for three to five days feeding on the host's blood. When children are screened every evening in the summer for attached ticks and when these ticks are removed immediately, transmission of Borrelia burgdorferi is very unlikely. Preventive treatment with antibiotics after a tick bite is not recommended.
However, when the early manifestation erythema migrans occurs, it should be treated with antibiotics. This treatment will stop further proliferation of the bacterium and prevent Lyme arthritis. In the USA, a vaccine against a single strain of Borrelia burgdoferi has been developed, but was withdrawn from the market for economic reasons. This vaccine is not useful in Europe due to strain variations.

Is it contagious?
Although it is an infectious disease, it is not contagious, since the bacterium must be transported by the tick.

What are the main symptoms?
The main symptoms of Lyme arthritis are swelling with effusion and limitation of movement in affected joint(s). Often the huge amount of swelling is accompanied by little or no joint pain. The joint most frequently affected is the knee joint, however, other large joints and even small joints may be affected. Rarely, the knee may not be involved at all. Two thirds of cases present as monarthritis of the knee joint. More than 95 % of cases take an oligoarticular course (four or less joints), often with a knee joint as the only remaining inflamed joint after some time. Lyme arthritis occurs as episodic arthritis in two thirds of cases. This means that arthritis disappears by itself after several days to a few weeks and, after an interval without any symptoms, the arthritis returns in the same joint(s).
The frequency and duration of episodes of joint inflammation usually decreases with time, but may increase and arthritis may become chronic in the end. However, rarely, there are also cases with chronic arthritis from the beginning (duration of arthritis for three months or longer).

Is the disease the same in every child?
No. The disease may be acute (i.e. there is a single episode of arthritis), episodic, chronic (of long duration).

Is the disease in children different from the disease in adults?
The disease in adults and children is similar. However, children may have a higher frequency of arthritis than adults. In contrast, the younger the child, the more rapid the course and the better the chance of successful antibiotic treatment.

How is it diagnosed?
Whenever there is newly appearing arthritis without a known cause, Lyme arthritis should be considered. The clinical suspicion is confirmed by laboratory investigation including blood tests and, in some instances, tests on synovial fluid (joints fluid).

In blood, antibodies against Borrelia burgdorferi may be found by a test called enzyme immunoassay. If there are IgG-antibodies to Borrelia burgdorferi found by enzyme immunoassay, a confirmatory test called Immunoblot or Western blot has to be performed. If this result confirms the enzyme immunassay findings, Lyme disease can be confirmed.
The diagnosis may also be confirmed by analysis of synovial fluid, in which the gene of the bacterium Borrelia burgdorferi may be found by a technique called polymerase chain reaction. This laboratory test is difficult to perform and few laboratories are able to generate valuable results.
Lyme arthritis should be diagnosed by the pediatrician or in a pediatric hospital. However, if treatment fails, a pediatric specialist should be involved in the further management of the child.

What is the importance of tests?
Apart from serological values, usually inflammatory values are taken and blood chemistry tests are done. In addition, other infectious causes of arthritis may be considered and tested by appropriate laboratory tests.
Once Lyme arthritis has been confirmed by laboratory values, including enzyme immunoassay and immuno-blot, it is not useful to repeat these tests, as they do not indicate response to antibiotic treatment. These tests may remain highly positive for years in spite of successful treatment.

Can it be treated or cured?
Since Lyme arthritis is an infectious bacterial disease, it can be treated with antibiotics. More than 80% of patients with Lyme arthritis are cured after one or two treatments with antibiotics. In the remaining 10–20% further antibiotic treatment usually does not cure the disease and anti-rheumatic treatment is necessary.

What are the treatments?
Lyme arthritis may be treated by oral antibiotics for four weeks or intravenous antibiotics for at least two weeks. Since compliance may be a problem with amoxicilline or doxycycline, intravenous treatment with ceftriaxon or cefotaxime may be more advantageous.

What are the side effects of drug therapy?
Side effects may occur, including diarrhoea, or allergic reactions. However, most side effects are rare and minor.

How long should treatment last for?
After antibiotic treatment has been completed, it is recommended to wait six weeks before concluding that treatment might not have cured the disease in the presence of ongoing arthritis.
If this is the case, another antibiotic treatment may be added. When, six weeks after the completion of the second antibiotic treatment there is still arthritis, anti-rheumatic drugs should be commenced.

What about unconventional and complementary therapies?
When antibiotic treatment fails, parents may be inclined to try unconventional remedies as in other rheumatic diseases. There is no evidence of their efficacy.

What kind of periodic check-ups are necessary?
The only useful check-up is examination of the joints. The longer the period of remission, the less chance there is of a relapse.

How long will the disease last for?
More than 80 % of cases disappear after one or two antibiotic treatments. In the remaining cases, arthritis will disappear over a course of months to years. Eventually the disease will stop altogether.

What is the long-term prognosis (predicted course and outcome) of the disease?
After treatment with antibiotics, in most cases the disease will go away without leaving any consequences. There are individual cases in whom definite joint damage has occurred, including limited range of motion and premature osteoarthritis.

Is it possible to recover completely?
Yes. More than 95% of patients will recover completely.

How could the diseases affect the child and family's daily life?
Due to pain and limitation of motion, the child may have difficulty in participating in some sporting activities. In most patients the disease is mild and problems are minor and transient.

What about school?
For a limited period of time the child might get a suspension for school sports, indicating that the student should decide on which activities to take part in.

What about sports?
The child or adolescent should decide on this matter. If the child takes part in a regular planned programme in a sports club, it might be advantageous to diminish the requirements of this programme, or to adapt the requirements.

What about diet?
The diet should be balanced and contain enough proteins, calcium and vitamins for the growing child. Dietary changes do not affect the course of the disease.

Can climate influence the course of the disease?
Although ticks need a warm and humid climate, once the infection has reached the joints the course of the disease is not influenced by climatic variations.

Can the child be vaccinated?

There are no restrictions concerning vaccinations. The success of vaccination is not affected by the disease, or by antibiotic treatment. Currently, there is no vaccine against Lyme borreliosis available.