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# Lyme Arthritis

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## 1. WHAT IS LYME ARTHRITIS

### 1.1 What is it?

Lyme arthritis is one of the diseases caused by the bacterium Borrelia burgdorferi (Lyme borreliosis) which is transmitted by the bite of hard ticks, including Ixodes ricinus.
While the skin, the central nervous system, the heart, the eye and other organs may be the target of infection with Borrelia burgdorferi, joints are the exclusive target in most cases of Lyme arthritis. 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.

### 1.2 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 4 years and is therefore primarily a disease of school children.
It occurs in all areas of Europe but is prevalent in Middle Europe and southern Scandinavia around the Baltic Sea. Although transmission depends on the bite of infected ticks, which are active from April to October (depending on environmental temperature and humidity), Lyme arthritis may start at any time during the year due to the long and variable time between the infecting tick bite and the onset of joint swelling.

## 1.3 What are the causes of the disease?

The cause of the disease is the bacterium Borrelia burgdorferi, which is transmitted via the bite of the tick Ixodes ricinus. Most ticks are not infected and hence most tick-bites do not result in infection and 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. Thus, although Lyme borreliosis, in the form of erythema migrans, may occur in up to 1 in 1000 children each year, the occurrence of Lyme arthritis, the late manifestation of the disease, is a rare event.

## 1.4 Is it inherited?

Lyme arthritis is an infectious disease and is not inherited. In addition, Lyme arthritis resistant to antibiotic treatment has been associated with certain genetic markers but the precise mechanisms of this predisposition are not known.

## 1.5 Why does my child have this disease? Can it be prevented?

In European regions where ticks are found, it is difficult to prevent children 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 day later, when the bacterium has reached the salivary glands of the tick and is excreted with saliva into the host (i.e. the human body). Ticks attach to their hosts for 3 to 5 days, feeding on the host’s blood. If children are screened every evening in the summer for attached ticks and if 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 of erythema migrans occurs, it should be treated by 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 had been developed, but it was withdrawn from the market for economic reasons.

This vaccine is not useful in Europe due to strain variations.

### 1.6 Is it contagious?

Although it is an infectious disease, it is not contagious (i.e. it cannot spread from one human to another), since the bacterium must be transported by the tick.

### 1.7 What are the main symptoms?

The main symptoms of Lyme arthritis are joint swelling with effusion and limitation of movement in the affected joint(s). Large swelling(s) are often accompanied by little or no joint pain. The most frequently affected joint is the knee, although other large joints and even small joints may be affected. It is rare for the knee to be not involved at all: 2/3 of cases present as monoarthritis of the knee joint. More than 95% of cases take an oligoarticular (4 or fewer joints) course often with a knee joint as the only remaining inflamed joint after some time. Lyme arthritis occurs as episodic arthritis in 2/3 of the cases (i.e. arthritis disappears on its own after several days to a few weeks and, after an interval without any symptoms, arthritis returns in the same joints). The frequency and duration of episodes of joint inflammation usually decreases with time but in some cases the inflammation may increase and arthritis may ultimately become chronic. There are also rare cases with long-lasting arthritis from the beginning (duration of arthritis for 3 months or longer).

### 1.8 Is the disease the same in every child?

No. The disease may be acute (i.e. there is a single episode of arthritis), episodic or chronic. The arthritis appears to be more acute in younger children and more chronic in adolescents.

### 1.9 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.