Lyme Disease: Information for Health Professionals

COMMUNICABLE DISEASE CONTROL

Background

In 1975 a cluster of cases of "juvenile rheumatoid arthritis" in Lyme, Connecticut was reported. These were later determined to be due to a tick-borne infection, confirmed when *Borrelia burgdorferi* was isolated from ticks and patients. The disease was named Lyme Disease.

The causative agent of this disease is the spirochete *B. burgdorferi*. Wild rodents and deer serve as hosts for *Ixodes scapularis* ticks (commonly known as deer ticks or blacklegged ticks) that carry the organism. Dogs, cattle and horses develop systemic diseases that may include the articular and cardiac manifestations seen in human patients. Although the wood tick is common in Manitoba, it is not a competent vector of *B. burgdorferi*.

Lyme Disease has been reported in the United States, Europe, China, Japan and the former Soviet Union. In Canada, it has been reported in either suspect or confirmed human cases, or infected ticks, in all Canadian provinces. Endemic populations of *I. scapularis* occur only in Ontario (Long Point, Point Pelee National Park, Rondeau Provincial Park). Over 265 *scapularis* ticks have been identified in Manitoba and 28 have tested positive for *B. burgdorferi*. There has been one laboratory-confirmed case of Lyme Disease since it became reportable in Manitoba (as of Jan. 1, 1999); five clinically-suspected cases have been treated by physicians.

Based on limited field studies, it does not appear that blacklegged ticks are currently reproducing in Manitoba. However, ongoing tick surveys have demonstrated that blacklegged ticks are introduced into the province each year, presumably on migratory birds, and some of these "imported" ticks are infected with the agent of Lyme Disease. For this reason, Lyme Disease should be considered in patients who exhibit appropriate symptoms.

Symptoms

Early stages of illness may be asymptomatic. The early symptoms of Lyme Disease are intermittent and variable, and most patients do not report a tick bite before the onset of symptoms. The first manifestation in about 60 per cent of persons is a red macule or papule that expands slowly in an annular manner to at least 5 centimetres in diameter, giving it a "bull's eye" appearance. There may also be clearing in the centre. This skin lesion is called erythema migrans (EM), and is not pruritic or tender. It usually occurs within 4 to 90 days after exposure. Other early symptoms may include fatigue, headache, stiff neck, myalgia, migratory arthralgias and/or lymphadenopathy. These may last several weeks or longer in untreated patients.

Within weeks to months after onset of the EM lesion, late symptoms may develop. These may consist of:

- Neurologic abnormalities such as aseptic meningitis, cranial neuritis including facial palsy, ataxia, motor or sensory radiculoneuritis, encephalitis or polyneuropathy.
- Cardiac abnormalities such as acute-onset A-V conduction defects or cardiomegaly, which may occur within a few weeks after onset of EM.
- Intermittent episodes of swelling and pain in one or a few large joints, especially the knees, which may develop and recur for several years. Chronic arthritis may result.

Diagnosis

Diagnosis is based on the clinical picture, coupled with serologic data and epidemiologic findings, particularly history of exposure to ticks.

Consultation with an infectious disease specialist is recommended, as differential diagnosis between Lyme arthritis, encephalopathy or polyneuropathy and other syndromes such as chronic fatigue or fibromyalgia is difficult, and the management differs significantly. Confusion can also occur between noninfectious cutaneous reactions to tick bites and Lyme-associated EM.

If the patient is acutely ill, early and late convalescent serum specimens for *B. burgdorferi* ELISA (enzyme-linked immunosorbent assay) 4 weeks apart should be

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sent to the Cadham Provincial Laboratory. If the patient is not in the acute stage of illness, only a single blood specimen is needed. IgM antibodies generally peak 3 to 6 weeks post-exposure, followed by IgG antibodies 1 to 3 weeks later. Elevated IgG levels may be detectable for weeks to years following infection. The Cadham Provincial Laboratory will forward positive and borderline specimens to Health Canada's National Microbiology Laboratory in Winnipeg for confirmation using western blot testing. Positive ELISA serology confirmed by western blot testing, in conjunction with pertinent clinical findings, is indicative of laboratory-confirmed Lyme Disease.

Serologic tests are insensitive during the first several weeks of infection and may remain negative in people treated early with antibiotics. Test sensitivity generally increases when patients progress to later stages of the disease. However, some chronic Lyme Disease patients remain seronegative. Treatment is therefore recommended following a clinical diagnosis of Lyme Disease, even if serologic testing is negative. Cross-reacting antibodies may cause false-positive reactions on ELISA in patients with syphilis, HIV infection, infectious mononucleosis, lupus or rheumatoid arthritis. Ticks should be sent for identification and testing as indicated in the Manitoba Health fact sheet titled *Lyme Disease*.

Reporting

Since January 1, 1999, Lyme Disease has been reportable in Manitoba. Suspected clinical cases should be forwarded for surveillance purposes to Manitoba Health, with or without laboratory confirmation. They will be recorded as possible or probable clinical cases. Many more suspected clinical cases are treated by physicians than are reported to Manitoba Health, so co-operation in reporting from physicians and other health professionals is very important.

Treatment

Early treatment is important to prevent late complications. Treatment should be initiated on the basis of clinical suspicion while laboratory investigation is ongoing. Treatment of late-stage infection is lengthier and more complex, and may require hospitalization. Consultation with an infectious disease specialist is recommended.

Early Erythema Migrans:	Early Disseminated Infection:
Adults:	**Adults:**
First line:	*First Line:*
• Doxycycline 100 mg orally, bid for 2 weeks[1,2]	• Doxycycline 100 mg orally, bid for 3 weeks[1,2]
Second line:	*Second line:*
• Amoxicillin 500 mg orally, tid for 2 weeks[2]	• Amoxicillin 500 mg orally, tid for 3 weeks[2]
OR	OR
• Cefuroxime axetil or erythromycin can be used in those allergic to penicillin or those who cannot take tetracyclines[2]	• Cefuroxime axetil or erythromycin can be used in those allergic to penicillin or those who cannot take tetracyclines[2]
Children:	**Children:**
• Amoxicillin 50 mg/kg/day in 3 divided doses for 2 weeks[2]	• Amoxicillin 50 mg/kg/day in 3 divided doses for 3 weeks[2]

1 Contra-indicated in pregnant or lactating women, or children < 9 years old.
2 Treatment failures may occasionally occur with any of these treatment regimens. Decisions about retreatment should be made in consultation with an infectious disease specialist.

For more information, please contact your local public health office.

Information sheets for the public on Lyme Disease (*Lyme Disease*) are available from Material Distribution Agency. Please call (204) 945-0570, Fax (204) 942-6212.

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