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Lyme Disease in Newfoundland

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Public Health FACTSHEET

Lyme Disease in Newfoundland

Introduction

Lyme Disease, spread by ticks, is an illness affecting both humans and domestic animals. The presence of the bacteria causing this illness was reported for the first time in this province in July 2001. This factsheet provides details on the disease and its spread.

Background

Lyme Disease was first identified in Lyme, Connecticut (USA) in the mid-1970's. Since then it has been located in most Canadian provinces (primarily Ontario) and US States (primarily northeast). It is caused by a bacteria (*Borrelia burgdorferi*) spread by ticks. Infections in humans are rarely fatal but can be very painful and may result in long term medical problems. Illness in domestic animals, such as cattle, horses, dogs and cats can occur. It is not thought that wild animals can become sick.

Ticks

Ticks are small, wingless relatives of spiders, mites and scorpions, that feed on the blood of mammals and birds. The most important for Lyme Disease is the black-legged, or deer tick (*Ixodes scapularis*). For a more complete description of the ticks in this province, please see "The Ticks of Newfoundland".

The Tick Life Cycle

There are four different stages in a tick's life; egg, larva, nymph and adult (Fig. 1). The larva, nymph and adult must have a blood meal before progressing to the next stage (or before laying eggs). The cycle (Fig. 2), from eggs to adults then back to eggs, takes at least two years depending on the weather.

These stages feed off of a variety of animals, usually smaller for the larva (mice, voles, birds), through medium sized for the nymph (squirrels, chipmunks, birds) and larger for the adults (deer, humans) though these are not strict rules.

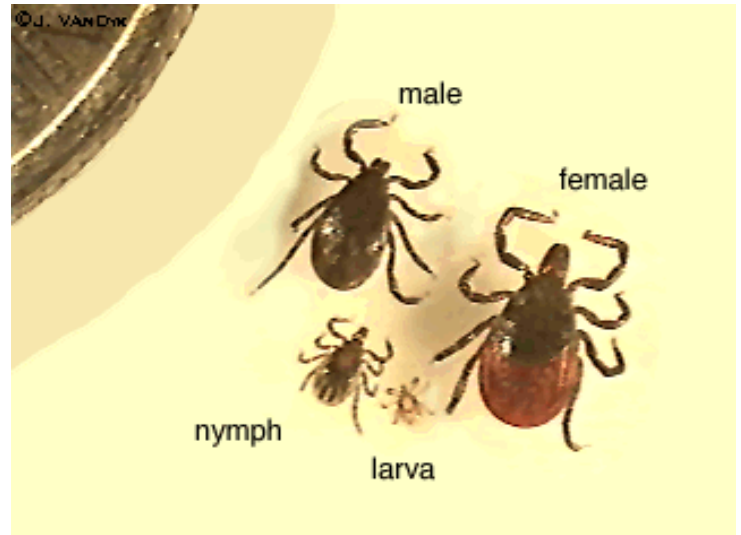


Figure 1: Stages of the deer tick beside a dime

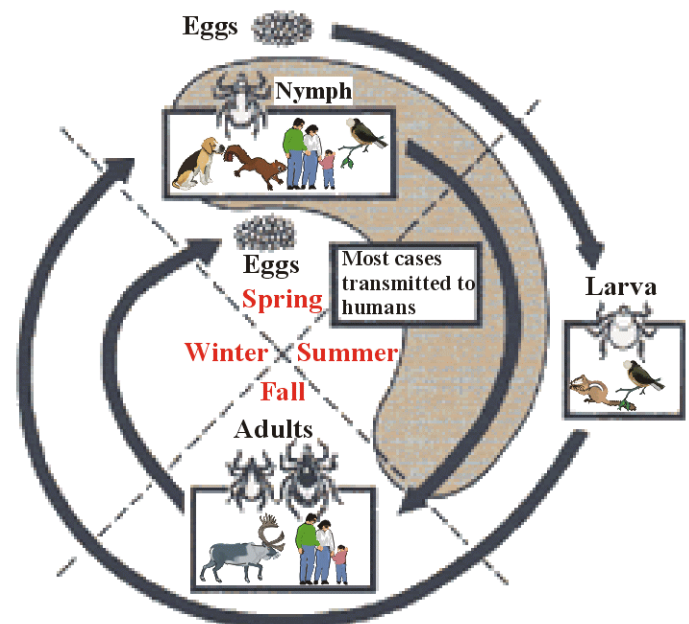


Figure 2: Life cycle of *Ixodes scapularis*

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The tick waits for a host while resting in bushes or tall grass. It senses an animal's presence by the increased levels of carbon dioxide which prompt it to attach to the animal when it brushes against the vegetation (ticks can't jump or fly).

A female that has had a blood meal is called engorged and is much larger than one that hasn't fed. The male dies after mating and the female dies after laying her eggs.

As the female does not pass the Lyme Disease bacteria to her eggs, it must be picked up from a wild animal during a blood meal. Usually the larvae or nymphs pick it up from a small mammal (such as the white-footed mouse), and then the nymph or adult spreads it to other animals (or humans) during their blood meals.

The Disease in Humans and Domestic Animals

When a tick finds a new host, it usually takes a number of hours before it finds a place to attach and even once it has started feeding it usually won't inject the bacteria into the host for awhile longer. It is stated that infection usually does not occur before 24-36 hours after attachment.

Infected people will usually show a bull's eye rash at the spot of the attachment followed by fever, headache, muscle and joint aches and fatigue. If untreated it can lead to longer term health problems.

Dogs are apparently 50% more likely to become sick than humans. The disease is more difficult to diagnose in these animals as there is no characteristic rash. The common signs are fever, loss of appetite, acute lameness without any other explanation and sore joints.

Prevention of Lyme Disease

The risks of contracting Lyme Disease in Newfoundland are unknown though they are considered to be low based on national experience. Further research will identify the levels of risk. The normal precautions for resisting bites (long sleeved shirts and long pants tucked in, use of an insect repellent with DEET) should be used. People walking through potentially infested areas should examine themselves after walking to see if any ticks have gotten on them.

Removal of ticks is done by taking tweezers then slowly and gently pulling the mouthparts out of the skin (from as close to the skin as possible).

Geographic distribution of the disease

In Canada, Lyme Disease is most commonly seen in southern Ontario where the necessary conditions for survival of the tick appear to be most predictable.

In Newfoundland, with the assistance of Health Canada, we have found a few cases of ticks carrying this organism however surveillance is ongoing. The tick has now been found in most parts of the Island of Newfoundland with none reported yet from Labrador.

Further Research

It is not known whether we have permanent populations of this tick here or just temporary ones due to their accidental arrival on migratory birds, though the current information suggests that we probably only have temporary ones that die out over the winter.

We also don't know which animals would be important in supporting permanent populations here. We don't have white-tailed deer or white-footed mice which are thought to be important elsewhere, but we do have other members of the deer family (moose and caribou) and a variety of mouse species.

Submissions

Anyone finding a tick is asked to submit it to this office (or through public health, a veterinarian or a Conservation Officer) for analysis. The tick should be put in a small container with moist cotton at the bottom so that it can be submitted for identification and analysis for Lyme Disease (if warranted).

More Information

For more information on this disease, please contact the author.

Any questions on human illness should be addressed to a family doctor or local public health office, any questions regarding the health of domestic animals should be addressed to a local veterinarian.

Image source:

Figure 1: Iowa State University

Figure 2: modified from US Center for Disease Control

Written by:

Dr. Hugh Whitney
Provincial Veterinarian
Department of Natural Resources
P. O. Box 7400
St. John's, Newfoundland
A1E 3Y5

(709) 729-6879 phone

(709) 729-0055 fax

e-mail: hughwhitney@gov.nl.ca