

Indigenous Lyme Disease in Quebec

To the Editor:

Lyme disease is caused by the bacterium *Borrelia burgdorferi*, which is transmitted by ticks feeding on infected animals, mainly rodents and birds. *Ixodes scapularis*, also known as the blacklegged tick, is the most common vector in eastern North America¹. Humans can acquire the pathogen when an infected tick feeds on them.

Lyme disease was first recognized in the late 1970s in Connecticut, USA, where an epidemic of oligoarthritis occurred². In the following years, expanding populations of *I. scapularis* were identified in northeastern and midwestern American states³. In the early 1990s, only one population of *I. scapularis* was documented in Canada, located in Ontario¹. Since then, 13 established populations of *I. scapularis* have been progressively identified in Canada³.

Recent evidence suggests that the risk of exposure to Lyme disease is increasing in the province of Quebec^{1,3,4}. Studies indicate that *I. scapularis* is establishing itself in southern regions, near the US border^{1,3}. Factors potentially contributing to the northward spread of *I. scapularis* include migratory birds and climate change⁵.

In 2010, Ogden, *et al* published data from passive and active surveillance performed in Quebec. Since 1990, a passive surveillance system collects *I. scapularis* through voluntarily participating veterinary and medical clinics⁶. The annual number of ticks submitted through this system has increased exponentially, from < 200 ticks in 2000, to > 1600 in 2008. The majority come from southern regions close to the US border.

Active surveillance performed at 71 woodland sites dispersed over 3 southern regions (Montérégie, Montréal, and Estrie) showed presence of *I. scapularis* at 55% of these sites³. The overall prevalence of *B. burgdorferi* in adult ticks was 13.0%. Although this prevalence was lower than that generally observed in the northeastern US, where it is ~25%, a significant proportion of *B. burgdorferi* from Quebec bore genetic markers associated with severe Lyme disease^{3,7}. However, to date, a single case of Lyme disease acquired in Quebec, at 1.5 km from the border with Maine, USA, had been reported in the literature, 20 years ago⁸.

In March 2010, we observed for the first time at our institution a case of Lyme disease contracted in Quebec. The patient, a 45-year-old military man, was referred to our rheumatology clinic to confirm the diagnosis of Lyme disease. In June 2009, he trained for several days in the woods of Farnham, a municipality located in Montérégie. Two weeks after training, he developed an expanding thoracic rash suggestive of erythema migrans. Although he did not remember having been bitten by a tick and did not travel outside Quebec for many years, Lyme disease was suspected by his family physician, and doxycycline was prescribed for 21 days, with complete resolution of the rash. *B. burgdorferi* serologies, performed by ELISA, were positive for IgM and negative for IgG, and were confirmed by Western blot.

In September 2009, the patient developed synovitis, mainly involving his right hand. Rheumatoid factor, anti-cyclic citrullinated peptide antibodies, and antinuclear antibodies were negative. A second course of doxycycline was given for 28 days, but no improvement was noted. The patient then came to our attention and was treated with intravenous ceftriaxone for 21 days. Although his arthritis did not improve, repeated serologies showed negative IgM and positive IgG to *B. burgdorferi*, further confirming the diagnosis.

Since November 2003, reporting of Lyme disease has been mandatory in Quebec and is done through confidential case report by physicians and/or laboratories to the Direction de santé publique (DSP) of each region, with serological confirmation by the Institut national de santé publique du Québec (INSPQ). To determine if other indigenous cases had occurred, reports to the DSP were reviewed and the INSPQ was contacted. Since 2003, 8 cases of confirmed indigenous Lyme disease (including ours) have

been identified out of 50 reported cases. Seven cases were acquired in Montérégie and 1 in Mauricie-Centre-du-Québec. Of these, 4 adults contracted the disease in 2008; 2 adults and 2 children in 2009. Seven patients presented with erythema migrans and 2 developed facial palsy. Prior to 2008, no indigenous case had been reported. Of note, all adult cases in Montérégie were military personnel who had trained in the woods near Farnham. Both children were probably exposed to ticks while playing in nearby woods. Only one case had a clear history of tick bite.

Data from passive and active surveillance suggest an emerging risk of exposure to Lyme disease in Quebec. Genetic analysis of *B. burgdorferi* indicates recent introduction from northeastern US³. In the last 2 years, at least 8 individuals developed indigenous Lyme disease. Although the overall risk of contracting the disease is currently low, projected increases in temperature are expected to accelerate the expansion of *I. scapularis*, potentially increasing disease risk⁵. These data emphasize the need to enhance surveillance activities and to raise our suspicion index for Lyme disease in Quebec.

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