Lyme borreliosis in Ontario: determining the risks

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In this issue of CMAJ Satyendra Banerjee and colleagues highlight the possibility of exposure to Lyme borreliosis in Ontario. What is the likelihood of encountering the blacklegged tick, *Ixodes scapularis*, the vector of Lyme borreliosis, in eastern Canada? Is this likelihood changing? And what are the implications?

Until recently, the only known Canadian population of *I. scapularis* was found at Long Point, on the north shore of Lake Erie. However, many individual *I. scapularis* ticks have been found, on people and pets with no history of travel, throughout Saskatchewan, southern Manitoba, Ontario, Quebec and the Atlantic provinces. Such ticks, found at sites where the species is not endemic, are “adventitious” (coming from without, accidental), having arrived as immature stages on birds migrating from tick-endemic areas to the south.

Adventitious ticks may transmit *B. burgdorferi* if they have previously fed on an infected host. Given that only 9 (6.5%) of the 139 adult ticks examined by Banerjee and colleagues carried *B. burgdorferi*, many probably originated in areas where few hosts were infected. However, in some localities up to about 20% of nymphs, which seem most important in transmitting *B. burgdorferi* to people, and more than 50% of adults may be infected.

Despite their wide distribution, the density of adventitious ticks in the environment is very low; hence, indigenous Lyme borreliosis is uncommon in Ontario, accounting for 127 of 280 cases of the disease diagnosed in the province between 1981 and 1998 (Charles A. LeBer, Ontario Ministry of Health and Long-Term Care: personal communication, 1999). Passive surveillance underestimates incidence but does permit comparisons of risk. From 1988 to 1998 the highest mean annual incidence of indigenous cases per 100 000 population in Ontario (0.4) was in the northwest, where an outdoor lifestyle may enhance exposure. In the region including Long Point, the annual incidence of indigenous cases for the same period was 0.2 per 100 000 population, whereas in the rest of the province it was 0.1 per 100 000 population. The overall mean annual incidence of Lyme borreliosis in Ontario, including cases acquired out of province, was 0.2 per 100 000 population (Charles A. LeBer: personal communication, 1999). These data are similar to the mean annual incidence of Lyme borreliosis in Ontario, in-
munodot assay) are more likely to produce a false-positive result than a true-positive result.16 The more specific second-step test, Western blotting, should be carried out as a sequel to a positive first-step test.14 Such testing, which is required by the Central Public Health Laboratory in Ontario (Charles A. LeBer: personal communication, 1999), reduces the risk of misdiagnosis on the basis of serologic testing. To detect specific IgG antibodies, Western blotting must be carried out after a month of illness.14,15 A diagnosis of Lyme borreliosis must be based on critical evaluation of all clinical and laboratory data,13-15 including any history of exposure to ticks or travel to an area were I. scapularis is endemic.

I. scapularis also transmits Babesia microti, the agent of human granulocytic ehrlichiosis, and deer tick virus, which is closely related to Powassan virus but of unknown pathogenicity.16 These agents, which may concurrently infect people with Lyme borreliosis and which do cause disease (although uncommonly) in the United States, have yet to be recognized in ticks in Canada. However, they may affect travellers.17

I. scapularis is not the most common tick on people and pets in Canada. The more common ticks do not transmit B. burgdorferi,18 but they do serve as vectors for other zoonoses. Dermacentor variabilis, found east of central Saskatchewan, and Dermacentor andersoni, found further to the west, transmit Rocky Mountain spotted fever; D. variabilis also transmits Q fever and tularemia.19 Ixodes cookei transmits Powassan virus.20

Simple measures can mitigate the risk of acquiring any tick-borne zoonoses. These include, at the societal level, publicizing areas where ticks are endemic, so that these areas may be avoided or greater vigilance taken by people who do visit them; and, at the individual level, tucking in pant cuffs and wearing long-sleeved shirts; applying DEET-based repellents to clothing and exposed skin; and carefully examining clothing and body for ticks after a day outdoors. The mouthparts of attached ticks should be grasped with forceps at skin level, and the tick slowly withdrawn. Early removal of ticks may diminish the probability of acquiring Lyme borreliosis and other zoonoses.

Current information on Lyme borreliosis, other than Canadian epidemiology, is readily accessible at the US Centers for Disease Control and Prevention Lyme disease Web site (www.cdc.gov/ncidod/dvbid/lymeinfo.htm).

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References


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