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Indigenous Lyme Disease in Alaska?

There have been several cases of *imported* Lyme disease in Alaska. The most recent involved an eight year old white male who visited Fauquier County, Virginia on June 23, 1991. He spent the day playing in the woods and afterwards was noted by his mother to have four ticks, including one which was engorged, on his body. The ticks were identified by a local resident as "deer ticks", likely *Ixodes damini*.

Approximately 10 days later his mother noticed a raised, red, circular area near the sight of one of the tick bites on the nape of his neck. This grew to a maximum diameter of 8 cm. and then faded over several weeks. There was no central clearing of the lesion. On returning to Alaska near the end of July, the child was described as being more moody, particularly more fussy and depressed.

On August 9, the child was brought to a local physician for a draining ear which was treated with a topical antibiotic. After hearing the history of an annular skin lesion, moodiness, and recent tick exposure, the physician obtained Lyme serology: the enzyme-linked immunosorbent assay was 4 (nml.< 0.9) and the indirect immunofluorescent titer was 1:1024 (nml.< 1:16). The parents brought their child to Anchorage for further evaluation.

At presentation he had normal vital signs, and a physical exam which was remarkable only for an S3 gallop. A complete blood count with differential and blood chemistry panel were normal. His EKG showed a prolonged PR interval (0.28 seconds; upper limit of normal for age 0.18). An echocardiogram was normal. He was admitted to the hospital with a diagnosis of Lyme disease with carditis and first degree atrioventricular block and placed on IV penicillin.

By the next day his PR interval was 0.17. According to his father he seemed back to normal. He was started on PO amoxicillin for 3-4 weeks and discharged.

Lyme disease is caused by the spirochete *Borrelia burgdorferi*. The disease is transmitted by a tick bite though frequently this history will not be obtained. Numerous species of tick have been shown to carry *B. burgdorferi*, primarily *Ixodes* spp. but also in the genus *Amblyomma*. Of particular interest to Alaska is *I. pacificus*.

This tick is thought to be a significant vector in California, Oregon, and Washington. While it has not been found in Alaska to date, it has been identified in Canada. In addition, *I. angustus*, which is found in Alaska, has recently been implicated in a case of Lyme disease in Washington State.

The first symptom for 60-80% of patients with Lyme disease is erythema migrans (EM). This skin lesion begins as a small macule or papule and progresses to an annular area, occasionally with central clearing and occasionally involving multiple sites. To be significant the lesion must be at least 5 cm. in diameter. The incubation period is 3 to 32 days. Fever, malaise, headache, and arthralgia can occur at this stage. Late manifestations may involve the cardiac, rheumatologic, and neurologic systems. Carditis occurs in about 8% of patients. Conduction abnormalities, particularly varying degrees of AV block, are most common; mean onset is three weeks after EM. Neurologic complications include seventh cranial nerve (Bell's) palsy, aseptic meningitis, radiculoneuritis and peripheral neuropathy, chorea, and encephalopathy and encephalomyelitis; onset is weeks to months after initial symptoms. Rheumatic involvement is manifested primarily by recurrent attacks of polyarthritis involving large joints, usually the knees; mean onset is six months.

Diagnosis of Lyme disease can be problematic. The organism does not grow well on culture and no microscopic or antigen detection methods are available. Serologic testing has not been standardized and both intra- and inter-laboratory variability can be large. Currently the Centers for Disease Control is attempting to develop uniform standards for laboratory testing.

Treatment can be equally problematic. Early disease can usually be treated successfully with oral medications including amoxicillin, doxycycline, or erythromycin. Treatment for late disease is less well defined and has ranged from oral medication in some cases to in-hospital intravenous therapy for several months in recalcitrant cases.

Alaska is one of only four states that have not reported *indigenous* Lyme disease. Because prompt diagnosis and treatment can lead to a better outcome and in order to document the occurrence of indigenous Lyme disease, *the Section of Epidemiology will coordinate appropriate serologic testing for health care providers with patients with possible indigenous Lyme disease.* These patients must meet the following criteria: either health care provider documented EM or a history of EM with one objective manifestation of late disease. Interested physicians and other health care providers should contact Brad Gessner, M.D., at 561-4406.

Thanks to Maria J. Wallington, M.D., for promptly reporting this case. Contributed by Brad Gessner, M.D., Section of Epidemiology