Borrelia miyamotoi infection--Interim surveillance case definition

Background

Borrelia miyamotoi was first identified in ticks in Japan in 1995 (1), and subsequently in ticks in the United States in 2001 (2). As with many organisms identified in ticks that are not associated with human illness, *B. miyamotoi* was not considered as a human pathogen until a 2011 case series of Russian patients infected with the bacteria (3). The first cases in the United States case were reported in 2013 (4). Since then, several cases have been described in the literature; symptoms of illness have ranged from flu-like to more severe manifestations such as meningoencephalitis. Other clinical features reported to date include elevated aminotransferase levels, leukopenia and thrombocytopenia. A retrospective serosurvey conducted in New England and New York State indicated that *B. miyamotoi* seroprevalence rates ranged from 3.2-9.3% about one-third the rate of *B. burgdorferi* infections in the same area (5). The spectrum of illness continues to be defined as additional cases are identified.

Illness caused by *B. miyamotoi* is not nationally notifiable and therefore no standardized case definition exists. This interim case definition is an attempt to facilitate coordinated data collection to better define the spectrum of illness associated with *B. miyamotoi* infection.

Clinical evidence:

Any acute onset of fever or chills and one or more of the following symptoms or signs: headache, sweats/chills, myalgia, arthralgia, malaise/fatigue, rash, abdominal cramps, nausea, vomiting, diarrhea, dizziness, confusion/altered mental status, photophobia, leukopenia, thrombocytopenia, or elevated aminotransferase levels.

Laboratory Criteria for Diagnosis

Supportive:

- Direct observance of spirochetes suggestive of *B. miyamotoi* on smear
- Elevated levels of IgG or IgM antibodies to *B. miyamotoi*

Confirmed:

- Isolation of *Borrelia miyamotoi* from a clinical specimen
- Detection of *Borrelia miyamotoi* DNA in a clinical specimen by PCR
- Evidence of seroconversion between acute and convalescent specimens, *including but not limited to* fourfold or greater change in serum antibody titer to *B. miyamotoi* antigen between paired specimens

Case Classification

Possible

A case with laboratory evidence of past or present infection but no clinical information available (e.g., a laboratory report).

Probable

A clinically-compatible case that has supportive laboratory results (defined above) with a specimen collection date within 6 months of symptom onset.

Confirmed

A clinically-compatible case that is laboratory confirmed with a specimen collection date within 6 months of symptom onset.

References:

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3. Platonov AE, Karan LS, Kolyasnikova NM, Makhneva NA, Toporkova MG, Maleev VV, et al. Humans infected with relapsing fever spirochete *Borrelia miyamotoi*, Russia. Emerg Infect Dis. 2011;17(10):1816.
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5. Krause PJ, Narasimhan S, Wormser GP, Barbour AG, Platonov AE, Brancato J, et al. *Borrelia miyamotoi* sensu lato seroreactivity and seroprevalence in the northeastern United States. Emerg Infect Dis. 2014;20(7):1183.