

***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:

1. Fukunaga M, Takahashi Y, Tsuruta Y, Matsushita O, Ralph D, McClelland M, et al. Genetic and phenotypic analysis of *Borrelia miyamotoi* sp. nov., isolated from the ixodid tick *Ixodes persulcatus*, the vector for Lyme disease in Japan. *Int J Syst Bacteriol.* 1995;45(4):804.
2. Scoles GA, Papero M, Beati L, Fish D. A relapsing fever group spirochete transmitted by *Ixodes scapularis* ticks. *Vector Borne Zoonotic Dis.* 2001;1(1):21.
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.
4. Krause PJ, Narasimhan S, Wormser GP, Rollend L, Fikrig E, Lepore T, et al. Human *Borrelia miyamotoi* infection in the United States. *New Engl J Med.* 2013;368(3):291-3.
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.

PATIENT DEMOGRAPHIC INFORMATION

Last Name	First Name	Middle Initial	Date of Birth ____/____/____	Gender Female Male Unknown
Address:		City	State	Zip Code
		Telephone Number () -		
Ethnicity: Hispanic/Latino Not Hispanic/Latino	Race: Asian Black/African American American Indian/ Alaskan Native White Unknown Native Hawaiian/Pacific Islander			

SYMPTOM INFORMATION

Symptom Onset Date: ____/____/____	Diagnosis Date: ____/____/____	Provider Diagnosis:
Fever: Yes No Unknown	If "Yes", what was highest temperature? °F/°C	
	If "Yes", was fever relapsing? Yes No Unknown	

LHD NOTE: If the HCP is unable to provide information about whether there was a history of fever, please contact the patient.

Headache: Yes No Unknown	Abdominal pain: Yes No Unknown
Chills: Yes No Unknown	Anorexia: Yes No Unknown
Night sweats: Yes No Unknown	Dyspnea: Yes No Unknown
Myalgia: Yes No Unknown	Erythema migrans rash: Yes No Unknown
Arthralgia: Yes No Unknown	Dizziness: Yes No Unknown
Fatigue: Yes No Unknown	Confusion: Yes No Unknown
Nausea: Yes No Unknown	Photophobia: Yes No Unknown
Vomiting: Yes No Unknown	Vertigo: Yes No Unknown
Diarrhea: Yes No Unknown	Meningoencephalitis: Yes No Unknown

Other symptoms (please describe):

CLINICAL INFORMATION

Leukopenia: Yes No Unknown	Thrombocytopenia: Yes No Unknown
Neutropenia: Yes No Unknown	Elevated liver enzyme levels: Yes No Unknown
Does the patient have any underlying immunosuppressive illnesses? Yes No Unknown	
If "Yes", please describe:	
Did patient die from their illness? Yes No Unknown	Was patient hospitalized? Yes No Unknown
Hospital Name:	Admit Date: Discharge Date:

DIAGNOSTIC LABORATORY INFORMATION

Please send a copy of any laboratory results, including co-infections, to NJDOH along with this completed case report form

<i>Borrelia mayonii</i> Positive Negative Not Done	Ehrlichiosis Positive Negative Not Done
Anaplasmosis Positive Negative Not Done	Lyme Disease Positive Negative Not Done
Babesia Positive Negative Not Done	Other: Positive Negative Not Done

TREATMENT

Name of Antibiotic(s)	Dosage and Duration	Dates of Treatment
Doxycycline		/ / to / /
Other antibiotic		/ / to / /
Not treated		

EXPOSURE INFORMATION

In the 30 days before the illness onset date, did the patient:

Have a history of a tick bite?	Yes	No	Unknown	Travel outside of New Jersey?	Yes	No	Unknown
If "Yes", date of bite:				If "Yes", dates of travel: ___/___/___ to ___/___/___			
If "Yes", town where bite occurred:				If "Yes", travel location(s):			

ADDITIONAL COMMENTS

--

PROVIDER INFORMATION

Provider Name	Telephone Number () -
Provider Address	Fax Number () -

Please fax completed case report form to the New Jersey Department of Health at: **(609)- 826-4874**