

Borrelia miyamotoi can be transmitted from mother ticks to offspring

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<https://danielcameronmd.com/borrelia-miyamotoi-can-be-transmitted-from-mother-ticks-to-offspring/>

In their article "[Borrelia miyamotoi: A Comprehensive Review. Pathogens.](#)" Cleveland and colleagues discuss *Borrelia miyamotoi* as an emerging tick-borne pathogen and how it can be transmitted from a mother tick to their offspring.

Cleveland et al. reviewed the proposed vertical transmission of *B. miyamotoi*.¹

- An adult female tick infected with *B. miyamotoi* lays eggs.
- The larva hatch from these eggs infected with *B. miyamotoi*.
- The larva, nymph and adult ticks remain infected.

Ticks can acquire *B. miyamotoi* after feeding on an infected tick – called horizontal transmission.

Cleveland et al. reviewed the proposed horizontal transmission of *B. miyamotoi*.¹

- The larva, nymph and adult ticks acquire *B. miyamotoi* from feeding on an infected host.
- The larva, nymph and adult ticks remain infected.

“*B. miyamotoi* can be transmitted from infected ticks to naïve mice during the first 24 hours of feeding,” the authors wrote.

B. miyamotoi can be transmitted to mice initially through the salivary glands and subsequently transmitted through the midgut.

Concerns surrounding Borrelia miyamotoi

Shapiro and Wormser summarized the challenges associated with *B. miyamotoi* in the Journal of the American Medical Association.²

- “This bacterium can be transmitted within the first 24 hours of tick attachment.”
- “The probability of transmission increases with every day an infected tick is allowed to remain attached.”
- While some patients with Lyme disease may exhibit a rash, “patients infected with *B. miyamotoi* in the United States typically do not have a rash.” But they may present with “a fever in conjunction with headache (96%), myalgia (84%), arthralgia (76%), and malaise/fatigue (82%).”
- There are no diagnostic tests for *B. miyamotoi* infection that have been approved by the US Food and Drug Administration.
- The fever may be relapsing.
- “Laboratory abnormalities include leukopenia (51%) and thrombocytopenia (60%), which are

rarely seen in Lyme disease.” [Editor’s note: These are also seen in Ehrlichia and Anaplasmosis.]

- “Severely immunocompromised patients may develop chronic meningitis.”

Fortunately, doxycycline and amoxicillin have been shown to effectively treat *B. miyamotoi* infection in patients, including those who are immunocompromised.

Editor’s notes: Fevers are infrequent and often do not relapse. The laboratory abnormalities seen in *B. miyamotoi* are also seen in Ehrlichia and Anaplasmosis. Long-term outcome studies are needed.

Related Articles:

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References:

1. Cleveland DW, Anderson CC, Brisette CA. Borrelia miyamotoi: A Comprehensive Review. Pathogens. Feb 7 2023;12(2)doi:10.3390/pathogens12020267
2. Shapiro ED, Wormser GP. Lyme Disease in 2018: What Is New (and What Is Not). JAMA. Aug 21 2018;320(7):635-636. doi:10.1001/jama.2018.10974

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