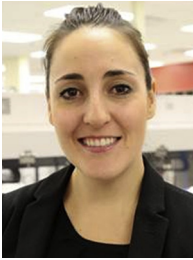


## Preface

# Tickborne *Borrelia* Infections: Beyond Just Lyme Disease



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*Editor*

Members of the *Borrelia* genus are associated with two main clinical syndromes: Lyme borreliosis and relapsing fever. With a few exceptions, these spirochetes share many similarities, including transmission via blood feeding arthropods, environmental maintenance among rodent populations, and interruption of the lifecycle following human infection. As a result of the high annual incidence of Lyme disease in both the United States (approximately 300,000 cases) and Europe (approximately 85,000 cases from 18 countries), Lyme borreliosis and its causative agents (primarily *Borrelia burgdorferi* in the United States and *Borrelia afzelii* and *Borrelia garinii* in Europe) often garner the most attention from both the medical community and public forums. Relapsing fever *Borrelia* infections remain uncommon in the United States, with approximately 480 cases reported to the Centers for Disease Control and Prevention between 1990 and 2011. However, these numbers may be an underrepresentation of the true incidence of infection due to the lack of sensitive diagnostic tools to identify these agents and possibly clinician unfamiliarity with the medical entity. Relapsing fever, particularly tickborne relapsing fever, remains endemic in certain impoverished regions of the world, including East Africa, and thus the potential for spread or encountering these organisms in returning travelers or immigrants continues to exist. Finally, new species within the *Borrelia* genus continue to be identified, and most recently, this includes detailed characterization of *Borrelia miyamotoi*. While genetically closely related to relapsing fever borreliae, infection with *B miyamotoi* does not present with classic relapsing fever symptoms, but rather more closely resembles that of Lyme disease, though notably without a characteristic rash.

In this issue of *Clinics in Laboratory Medicine*, we delve into key aspects of Lyme disease, including an update on the epidemiology and the increasing geographic spread of *B burgdorferi* in the United States. In addition, a review of *B burgdorferi* pathogenesis and the associated host response is provided. The common and uncommon clinical manifestations of Lyme disease, with an in-depth discussion of Lyme neuroborreliosis,

are presented, alongside a review of the consensus treatment guidelines. While the focus of this issue is on tickborne *Borrelia* infections, it is prudent to emphasize the risk of other tickborne infections that may be transmitted alongside *B burgdorferi*. Therefore, these potential coinfecting agents, including *Anaplasma phagocytophilum*, *Babesia microti*, Powassan (deer tick) virus, and others, are also reviewed. As serologic testing for Lyme disease remains the preferred diagnostic modality, the most recent advancements in this field are summarized, as are alternative methods of identification, including molecular testing and antigen detection. A detailed discussion of the relapsing fever borreliae and *B miyamotoi*, including their clinical presentation, diagnostic tools, and treatment options, is also provided. Finally, this issue concludes with an in-depth review of measures that can be taken to prevent tickborne infections, including available physical barriers and the status of vaccine development.

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