



Overview

Lyme disease, caused by the spirochete *Borrelia burgdorferi*, is the most frequently reported arthropod-borne disease in the United States.¹ The bite of an infected *Ixodes* species tick transmits the spirochete. Lyme disease can cause musculoskeletal, neurological, and cardiovascular manifestations that may be difficult to treat. Differential diagnosis can also be difficult, and co-infection, particularly with *Babesia microti* or *Ehrlichia* species can occur.^{1,2}

Babesiosis presents with a malaria-like illness. Prevalence of antibodies to *Babesia* spp. is about 3% in endemic areas, 9-10% in *Borrelia* antibody-positive individuals from endemic areas³ and 4-5% in selected populations of blood donors tested by IFA or EIA,⁴ which are the methods of choice for antibody detection.^{5,6}

Human monocytic ehrlichiosis (HME) and **human granulocytic ehrlichiosis (HGE)** should be considered in the differential diagnosis of individuals with flu-like illness following outdoor activities in areas populated with the tick vectors. Ehrlichiosis can range from asymptomatic or self-limited disease to severe respiratory distress or even death in some (~5%, usually immunocompromised) patients.^{7,8} Because *Ehrlichia* shares a common vector with Lyme disease in some areas, differential diagnosis can become difficult.⁹

Clinical Utility

- Differential diagnosis of Lyme Disease, ehrlichiosis, or babesiosis in endemic areas.
- Identification of potential co-infection with different organisms.

Relevant Tests

8968 *Borrelia*, *Babesia*, *Ehrlichia*: Lyme Co-Infection (Tick-Borne Disease Antibody Panel with *Borrelia burgdorferi* (Lyme), *Ehrlichia equi* (HGE), *Ehrlichia chaffeensis* (HME) and *Babesia* IgG & IgM Antibodies [IFA])

7570 *Borrelia burgdorferi* DNA DetectR™ [PCR]—useful for the diagnosis of early disease; identifies the presence of *B. burgdorferi* DNA in body fluids including cerebrospinal fluid, synovial fluid, blood and urine.

8944 *Borrelia burgdorferi* C6 Peptide Antibody DetectR,™ EIA—useful in identifying *Borrelia burgdorferi* infection; C6 Peptide antibody testing differentiates patients with active infection from patients who have been vaccinated with the OspA Lyme vaccine.

8954 *Borrelia burgdorferi* IgG & IgM Antibodies plus C6 Peptide Antibodies—useful in identifying exposure to *Borrelia burgdorferi*; helpful in initial Lyme Disease assessment.

7711B *Borrelia burgdorferi* IgG & IgM Immunoblot: CDC Criteria with bands

7721B *Borrelia burgdorferi* IgG & IgM Immunoblot: Alternate Criteria with bands—provides sensitive, specific detection of antibodies to denatured *B. burgdorferi* antigens and is useful in confirming the diagnosis. While not recommended as a primary test for Lyme Disease, immunoblot is more specific than many EIA tests.

7848 *Ehrlichia chaffeensis* (HME) *Ehrlichia equi* (HGE) IgG & IgM Antibodies [IFA]

2350 Tick Identification reflex to *Borrelia burgdorferi* DNA by PCR—if tick specimen is identified as being the *Ixodes* tick and one of two species associated with Lyme disease, it is tested by PCR

References

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