Lyme Disease

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Recommended Citation
Bode, Courtney, "Lyme Disease" (2017). Nursing Student Class Projects (Formerly MSN). 220.
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Lyme disease
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Introduction
• Lyme disease is a bacterial infection transmitted by~black-legged (deer) ticks. This disease is the most common vector-borne illness in the United States (Maloney, 2016). The tick transmits *Borrelia burgdorferi*, which is the bacteriologic agent of LD.
• The Center of Disease Control (CDC) reports the disease is highly underreported in the United States (Clayton, Beisel, Jones, Jones, & Schaffner, 2015).
• Even with the disease being underreported, LD is the fifth most commonly reported nationally notifiable disease (Delorey, et al., 2015).

Signs and Symptoms
• Signs and symptoms of Lyme disease can vary greatly in severity. The disease often causes multisystemic effects, starting locally at the site, and then the bacteria can spread to other body areas, causing systemic illness in late-stage disease (Maloney, 2016).

Underlying Pathophysiology
• *Borrelia burgdorferi* is a spirochaete bacteria that is distributed worldwide, including 11 congeners, with those that commonly infect humans (Chomel, 2015).
• A tick transmits the bacteria by the tick eggs hatching as unfed larvae, moving to an infected host. As the tick matures into a nymph, the bacteria remains in the gut until the next tick feeds, allowing skin infiltration in the tick. The spirochaete multiply in the tick’s salivary glands and is then injected into the second host (human). This process involves spirochaete proliferation, migration, and injection into the new host (Maloney, 2015).
• Usually the tick must be attached for 36 to 48 hours to transmit the bacteria (Eggers, 2015).
• Spirochaete dissemination develops similar symptoms to bacteremia (Halperin, 2015).

Significance of Pathophysiology
• A “two-step” approach has been mainly used to diagnose LD.
• Both steps can be accomplished using the same blood sample. First, a quantitative screening is done using an enzyme immunoassay (EIA). Specimens that yield positive or equivocal results should then be tested by Western blot (Eggers, 2015). Antibodies against *B. burgdorferi* are present in humans with late LD, but may not be developed in those people who have early LD (Eggers, 2015).
• The bacterial infection can cause additional manifestations including the nervous system, heart, or joints, with symptoms of fatigue, arthralgias, myalgias, headache, neck pain, paresthesia, coronary artery disease, and syncope (Eggers, et al., 2015).
• Males and females with confirmed LD have similar clinical features and outcomes (Vinten-Ar Machine, W. & Wormser, 2015).

Lyme disease is everywhere, including syringomyelia, arthritis, facial palsy, radiculopathy, myelopathy, and is then illustrated. Immunoblot should not be performed if the EIA is negative or instead of an EIA. When testing for confirmatory early disease without EIAs, immunoglobulin (Ig) and IgM assays should be performed. To confirm late disease, only IgG should be performed as false-positive results may occur with the IgM. A positive IgG immunoblot requires detection of antibody (‘bands’) to ≥5 kDa polypeptides while a positive IgM immunoblot requires detection of antibody to ≥2 kDa polypeptides. Results are considered positive if both the EIA and immunoblot are both positive. (Eggers, 2015).
• Antibodies against *Borrelia burgdorferi* are present in humans with late LD, but may not be developed in those people who have early LD (Eggers, 2015).
• The bacterial infection can cause additional manifestations including the nervous system, heart, or joints, with symptoms of fatigue, arthralgias, myalgias, headache, neck pain, paresthesia, coronary artery disease, and syncope (Eggers, et al., 2015).

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• Adult deer tick, 2016. Retrieved from https://www.riftvirus.us/dogs/cats/lyme bệnh-
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