Babesia

Babesia is a protozoan parasite that causes the disease babesiosis, which is similar to malaria. Symptoms include high fevers, shaking chills and a hemolytic anemia. The Babesia parasite infects and reproduces in red blood cells, where they can be visualized as Maltese cross inclusions on blood smear. The damage to the red blood cells leads to lysis, causing hemolytic anemia. This disease is endemic in the Northeastern United States and is transmitted by the Ixodes tick, which is the same vector that carries Borrelia burgdorferi. Patients with asplenia or those who are immunocompromised are at a greater risk for babesiosis.



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Characteristics

Protozoa
Propeller-protozoa
Babesia is a protozoan, which is a unicellular eukaryotic organism.

Ixodes Tick
X-tick
This disease is transmitted by the Ixodes tick, which is the same vector that transmits Borrelia burgdorferi, the organism responsible for Lyme disease, as well as the bacterium Anaplasma, which causes anaplasmosis. While this may seem like minutiae in the disease's broader, clinically relevant aspects, vectors are commonly tested topics. There are several vector-borne illnesses with relatively similar and nonspecific symptomatology to be familiar with.

Same vector as Borrelia
Barrels
This disease is transmitted by the Ixodes tick, which is the same vector that transmits Borrelia burgdorferi. Sometimes, individuals can be infected with both diseases simultaneously.

Northeastern US
Northeastern United States map
This disease is endemic in the northeastern United States. Notable highly endemic areas include Nantucket Island, Martha’s Vineyard, Cape Cod, some suburbs of Boston, counties east of the Hudson River, portions of Rhode Island, New Jersey, Connecticut, and Massachusetts.

Asplenia
A-spleen
Patients who are immunocompromised or without an intact, operational immune response, such as those who are asplenic, are at a much greater risk for severe babesiosis. Severe babesiosis can result in catastrophic complications that include acute respiratory distress syndrome (ARDS), disseminated intravascular coagulation (DIC), congestive heart failure (CHF), and even acute renal failure (ARF).

Signs and Symptoms

Fever
Fever-beaver
Babesiosis often presents with symptoms similar to malaria, including high fevers and shaking chills.

Hemolytic Anemia
Hemolysing-RBCs from Anemone
Babesia microti infects and reproduces in red blood cells, resulting in cell lysis, and producing a hemolytic anemia.

Diagnosis

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Blood Smear

Blood Smear on Glass

It is important to know that the incorporation of a peripheral blood smear is beneficial in diagnosing babesiosis since this parasite resides inside RBCs and forms a characteristic Maltese cross pattern from four, asexually budding merozoites.

Maltese Cross

Maltese cross

Babesia microti infects and reproduces in red blood cells, where they can be visualized by the pathognomonic Maltese cross inclusions on blood smear. The Maltese cross formation is caused by four merozoites that are budding asexually.

Treatments

Atovaquone

Avocado-queen

Atovaquone is an analog of ubiquinone, and this antipneumocytic (for Pneumocystis jirovecii pneumonia) drug is also used in the treatment of babesiosis, often in conjunction with the macrolide antibiotic, azithromycin. This regimen is commonly instituted for seven to ten days. A less-tolerated alternative consists of the combination of quinine and clindamycin.

Azithromycin

Zipper-mice

Azithromycin is a macrolide antibiotic that is often coupled with atovaquone for a seven to ten-day regimen in the treatment of babesiosis. A lesser-tolerated alternative consists of the combination of quinine and clindamycin.

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