Babesiosis: An Under-Recognized Tick Bourne Illness

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Babesiosis: An Under-Recognized Tick Borne Illness

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ABSTRACT:

Introduction- Tick-borne illnesses, namely Lyme disease, are common in Eastern Pennsylvania. In the summertime, Lyme is frequently included in the differential for unexplained fever. While doxycycline is used to treat most tick-borne illnesses, it does not cover Babesia. As more cases of Babesiosis are being recognized, this diagnosis should be pondered in at risk individuals.

Case presentation- A 41 year old gentleman presented to the ER with eight days of fevers, chills and congestion. He previously saw his family physician who placed him on levofloxacin. His fevers continued and developed myalgias and headaches. He returned to his doctor who changed his antibiotic to doxycycline. He took one dose of doxycycline without relief and came to the hospital. Initial labs revealed pancytopenia with transaminitis. Upon questioning, he stated that he had recently been hiking, but had not noticed any rash. He was admitted with a preliminary differential of Lyme disease versus Ehrlichiosis and was continued on doxycycline. Lyme and ehrlichia/anaplasma titers were sent. His fevers persisted and his hemoglobin decreased. Consequently, babesiosis was considered. A blood smear for parasites was sent which showed Babesia. Doxycycline was continued with the addition of atovaquone and azithromycin. His titers, excluding Babesia, were negative. His blood counts and LFTs improved and was discharged.

Discussion- Babesiosis typically develops 1-6 weeks after tick bite. Symptoms include fevers, fatigue, as well as headaches and myalgias. Rash is typically absent unless co-infected with B.Burgdorferi. Mild disease is frequently self-limited leading to under diagnosis. Severe cases are usually seen in asplenic patients and hemolytic anemia, as well as transaminitis, may occur. Diagnosis is made through examination of the blood smear and first line treatment is with atovaqone and azithromycin. Given the prevalence of Ixodes ticks in Pennsylvania, when a patient presents with fevers in the summer, Babesiosis should be considered.

INTRODUCTION:

The following case demonstrates the importance of including babesiosis, an under-recognized tick borne illness, in the differential diagnosis for summer fever in areas with a high prevalence of Ixodes Scapularis ticks (such as Eastern Pennsylvania).

CASE REPORT:

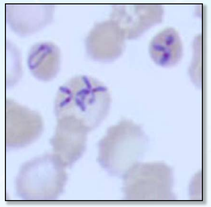
A 43 year old male presented to the ER in July with eight days of fevers, chills, and congestion with a “sinus headaches”. He saw his family doctor who placed him on levofloxacin. He took this for five days but continued to have persistent symptoms as well as higher temperatures with myalgias and arthralgias. He had no rash. He saw his family physician who placed him on doxycycline of which he took one dose, however he began to feel worse, and presented to the emergency room. He noted that he spends much of his time outdoors and had recently gone camping and hiking. He denied any rashes.

PMHx: ADHD, migraine headaches, heart palpitations
PSH: Denies surgical history
Fx: Denies history of infectious disease in the family
SHx: Works as electrical engineer, denies tobacco use, alcohol, or illicit drug use. Denies recent travel
Allergies: Azithromycin (rash), penicillin (unknown reaction)
Medications: Tylenol PRN, doxycycline x 1 dose

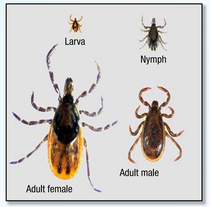
PHYSICAL EXAM:

Vital signs: T: 102.9, BP 151/83, HR:95, RR:18, 99% RA
General: Ill appearing
HEENT: PERLA, no scleral icterus, no sinus tenderness, no pharyngeal erythema or exudates. No enlarged tonsils
Neck: Supple without thyromegally
CV: Mildly tachycardic, +S1/S2, no murmurs, rubs, gallops
Resp: Lungs CTA bilaterally
GI: Soft, NT/ND, +bowel sounds, no hepatosplenomegally
Extremities: No clubbing, cyanosis, or edema
Lymph: No lymphadenopathy
Neurologic: No focal deficits
Skin: No rash present
Musculoskeletal: No active synovitis
Psychiatric: Mood appropriate

WBC	3.3 (L)
HGB	12.2 (L)
Hematocrit	35.7 (L)
Platelets	91 (L)
AST	121 (H)
ALT	101 (H)
Alkaline phosphatase	65
Total Bilirubin	1.7 (H)
Blood cultures	Negative x 2
Lactate	0.7



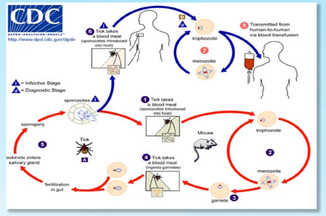
Example of Maltese cross seen with babesiosis (1)



CDC

INVESTIGATIVE STUDIES: Tick Bourne Organisms

Lyme IgM: 1.01 (equivocal)
Lyme Total Ab: 0.71
Lyme Western Blot: One band
Ehrlichia/Anaplasma serologies: Negative
B. Microti IgM: 1:64 (H)
B. Microti IgG: 1:64 (H)
Blood smear (malarial preparation): +Babesia (<0.1% parasitemia)



CLINICAL COURSE:

The patient was admitted to the hospital. He was given IVF and started on empiric doxycycline for questionable lyme disease vs. ehrlichiosis/anaplasmosis (given leukopenia) and respective serologies were sent. He continued to have fevers and myalgias despite being on doxycycline. He was seen by infectious disease who requested a blood smear for parasites and added babesia serologies. The blood smear was positive for babesia and the patient was started on azithromycin and atovaquone. Doxycycline was initially continued as there was a concern for concomitant infection, but was discontinued once titers were negative. He had symptomatic and laboratory improvement and was continued on antibiotics for a total of 10 days.

Diagnosis: Babesiosis

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1. Vannier E, Krause PJ. Human babesiosis. N Engl J Med 2012; 366:2397.
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3. Krause PJ, Telford SR 3rd, Spielman A, et al. Concurrent Lyme disease and babesiosis. Evidence for increased severity and duration of illness. JAMA 1996; 275:1657.
4. Krause PJ, Telford SR 3rd, Spielman A, et al. Concurrent Lyme disease and babesiosis. Evidence for increased severity and duration of illness. JAMA 1996; 275:1657.
5. Ruebush TK 2nd, Juranek DD, Chisholm ES, et al. Human babesiosis on Nantucket Island. Evidence for self-limited and subclinical infections. N Engl J Med 1977; 297:825.
6. Center for Disease Control.
7. Medical Chemical Corporation (graphic for Maltese cross) (1).
8. Harrison's Principles of Internal Medicine

DISCUSSION:

Babesiosis is caused by protozoa of the genus Babesia. These protozoa are mostly transmitted by tick vectors, though rarely may be transmitted through blood transfusions or through trans-placental transmission. Transmission peaks during the warm months. These protozoa cause lysis of host red blood cells. In the Northeastern United States (including Eastern Pennsylvania the location of this patient) B. microti is the most common etiologic agent and in fact this the most predominant species in the United States. Babesiosis is endemic in the Northeastern US, especially in New England (Nantucket, Martha’s Vineyard, Cape Cod), as well as in the upper Midwest. Ixodes Scapularis (deer tick) is the main tick vector for not only B. microti but also Borrelia burgdorferi and Anaplasma phagocytophilum. Co-infection is common in tick-infested areas.

Clinically, patients may be asymptomatic, but if symptoms do occur patients will typically present with non-specific symptoms such as fatigue, malaise, weakness, and anorexia. Other less common symptoms are also non-specific and include headache, sore throat, dyspnea, myalgias and arthralgias. Our patient had many of these symptoms. Fever usually occurs and may be very high. Splenomegally and hepatomegaly may be noted on exam. Erythema migrans can be present if co-infected with lyme. The patient may also have signs of hemolytic anemia such as mild jaundice and dark urine. Laboratory values usually show thrombocytopenia, anemia, and elevated liver enzymes. Leukocyte values may be variable. Rarely, babesiosis may be severe and this usually depends on degree of parasitemia and immune status of the host. Asplenic patients, older patients, and other immunocompromised states (HIV, cancer, transplant patients, patients on biologics) increase risk for severe illness. In severe illness, multi-organ failure may occur.

Definitive diagnosis is made by examining at the thin blood smear in which intracellular protozoa are present. The “Maltese cross” pattern may be present. Serology is non-diagnostic but can determine chronicity of disease. Treatment should not be given for asymptomatic patients but may be considered if parasitemia is chronic. Mild disease is typically treated with atovaquone and azithromycin. In severe disease, typical treatment consists of clindamycin and quinine. Treatment is typically for 7-10 days. In severe disease, exchange transfusion may be considered. It is important to note that babesiosis is not covered by doxycycline, which is commonly prescribed for other tick borne illnesses. This is important as ticks may serve as vectors for multiple organisms and doxycycline may not be appropriate as sole empiric therapy.

CONCLUSION (KEY POINTS):

In conclusion, it is important to consider babesiosis in a patient who presents with flu like symptoms in the summer months especially if the patient has known tick exposure. This is especially true in the Northeastern United States and Upper Midwest. Furthermore, it is also important to realize that while most tick bourne illnesses are treated with doxycycline, appropriate treatment for babesiosis is atovaquone and azithromycin in mild disease and clindamycin and quinine in severe disease (or in patients with mild disease with allergies to traditional treatment).