Tick-borne Disease in Central Pennsylvania: Considering Anaplasmosis

Kishan Patel[1], Dr. Frederick Murphy[2], Dr. Jason Bankert[2], Dr. Alan Kivitz[2]

[1]Drexel University College of Medicine, Philadelphia PA
[2]Altoona Arthritis & Osteoporosis Center, Duncansville PA

Altoona Arthritis & Osteoporosis Center | Altoona Center for Clinical Research

DREXEL UNIVERSITY College of Medicine

Introduction

In this case report, we discuss a patient who presented to our community-based rural rheumatology clinic in central Pennsylvania found to have anaplasmosis. Anaplasmosis (*Anaplasma phagoctyophilum*) shares many clinical signs with Lyme disease (*Borrelia burgdorferi*), including arthralgia, rash, and flu-like symptoms, yet is not frequently tested for nor identified. Since early detection and treatment are key for patient outcomes, clinicians should consider a wide array of tickborne diseases, not only Lyme disease, when working up non-specific arthropathies.

Case Description

Our patient is 65-year-old woman who was referred to our rheumatology clinic by her primary care provider after a positive antinuclear antibody test. The patient presented to our office with generalized, intermittent joint and muscle pains for the past few months. She noted a history of a tick bite several years ago but could not remember if she was treated with antibiotics at that time. On physical examination, she had tenderness to her shoulders, elbows, hips, knees, and several joints in the hands bilaterally. For further evaluation, blood tests and joint imaging were ordered. Given the prevalence of ticks in the region, along with the patient's remote history of tick exposure, the patient was also tested for multiple tickborne diseases, including Lyme disease, anaplasmosis, and ehrlichiosis. One week later, indirect immunofluorescence antibody (IFA) serology resulted positive 1:64 *A. phagocytophilum* IgG antibodies. The patient was prescribed doxycycline 100 milligrams twice a day for 10 days for treatment of anaplasmosis. She experienced significant symptom improvement with antibiotics.

Image 1. Blacklegged tick (Ixodes Scapularis)

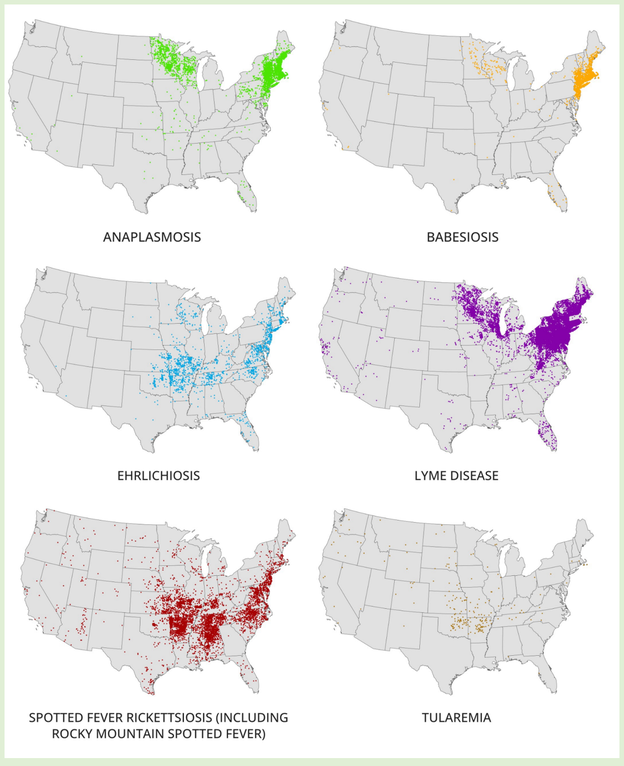

Figure 1. Reported cases in 2018 with one dot representing one case

Discussion

Figure 1 demonstrates the distribution of common tickborne diseases within the United States. Anaplasmosis is caused via a bite from a tick infected with the bacterium *Anaplasma phagoctyophilum*. The bacteria are carried by the blacklegged tick (*Ixodes scapularis*) in the northeast/midwestern US, shown in Image 1. If infected, patients with anaplasmosis show symptoms within 5-14 days of the tick bite. Early symptoms include fever, chills, headache, myalgia, and gastrointestinal upset. General laboratory findings can include anemia, thrombocytopenia, left shift leukopenia, and transaminitis. Anaplasmosis is commonly diagnosed with paired serologic tests for IgG against *A. phagoctyophilum* antigen which can be 80 – 86% sensitive. Treatment with doxycycline is recommended for all ages and can be started empirically without requiring laboratory confirmation.

Our patient presented with a non-specific arthropathy impossible to discern between tickborne etiologies. If she had been only tested for Lyme disease, her treatment of anaplasmosis might have been severely delayed. It is important to test for other tickborne diseases when working up Lyme, because untreated tickborne disease greatly increases the risk of developing serious illness, including respiratory failure, organ failure, and death. Providers in high-risk areas should account for non-Lyme tickborne etiologies in their differential to ensure timely recognition, testing, and treatment to prevent serious patient complications.

References

Anaplasmosis | Centers for Disease Control and Prevention. (2022). Accessed: 19 April 2023: https://www.cdc.gov/anaplasmosis/index.html.

Bakken JS, Dumler JS: Clinical diagnosis and treatment of human granulocytotropic anaplasmosis . Ann N Y Acad Sci. 2006, 1078:236-47. 10.1196/annals.1374.042

Bauer, Scott. *Adult deer tick, Ixodes scapularis*. 10 Dec. 2020. *Agricultural Research Service*, USDA.

McClain MT. (2024). Human ehrlichiosis and anaplasmosis. UpToDate, Connor RF (Ed), Wolters Klumer. (Accessed on April 3, 2024.)

Overview of Tickborne Diseases | Centers for Disease Control and Prevention. (2022). Accessed: 18 April 2023: https://www.cdc.gov/ticks/tickbornediseases/overview.html.

Sanchez E, Vannier E, Wormser GP, Hu LT: Diagnosis, Treatment, and Prevention of Lyme Disease, Human Granulocytic Anaplasmosis, and Babesiosis: A Review. JAMA. 2016, 315(16):1767-77. 10.1001/jama.2016.2884