Tick-borne Diseases other than Lyme Disease

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Disclosures

• None
Case #1

- A 7 year old boy living in Connecticut presents with several days of fever, fatigue, and body aches
- He had been camping with his family at a local state park 2 weeks prior to presentation
- His mother reports multiple mosquito bites but doesn’t recall any tick bites
- No rash was noted

Clinical suspicion of tick-borne disease based on patient characteristics:
- Illness during tick season: fever, chills, headache, muscle aches, joint pain, neck pain, skin rash, Bell’s palsy, heart rhythm disturbances, hypotension, jaundice, sepsis AND
- Known tick exposure OR
- Environmental exposure (outdoor activities, wildlife)
Distribution of Key Tickborne Diseases, United States, 2015

NOTE: Each dot represents one case. Cases are reported from the infected person's county of residence, not necessarily the place where they were infected.

NOTE: During 2015, babesiosis was reportable in AL, AR, CA, CT, DE, E, IN, IA, KY, ME, MD, MA, MN, MI, ME, NH, NJ, NY, ND, OH, OR, RI, SC, SD, TN, TX, UT, VT, VA, WV, WI, and WY.

NOTE: In 2015, no cases of tickborne illnesses were reported from Hawaii. In 2015, Alaska reported 1 travel-related case of Lyme disease and 2 cases of tularemia.

Click to view more information about tick-borne diseases.
Case, Continued

- LYME was performed - **NEGATIVE**
- TKPNL was performed; PCR for:
  - EHRL: *Ehrlichia chaffeensis, Ehrlichia ewingii, Ehrlichia muris chaffeensis, Anaplasma phagocytophilum*
  - BMIYA: *Borrelia miyamotoi*
  - LBAB: *Babesia microti, Babesia duncani, Babesia divergens/MO-1*
  - *Babesia* PCR was positive for *Babesia microti*
Babesiosis

- Parasitic infection
- Primarily due to *Babesia microti* in the United States (including the Northeast and upper midwest)
  - Due to the bite of *Ixodes scapularis*, the black-legged (‘deer’) tick
  - Less commonly due to *B. duncani* (west coast) and *Babesia MO-1*
  - Due to bites of *Ixodes pacificus* (*B. duncani*)
  - and (possibly) *Amblyomma americanum* (*Babesia MO-1*)
- *B. divergens* is the most common cause of babesiosis in Europe

Babesiosis – Clinical Presentation and Treatment

- Often asymptomatic or mild disease
- Elderly, immunocompromised, and asplenic patients are at risk for severe disease.
- Treatment is with a combination of agents:
  - Atovaquone PLUS azithromycin OR
  - Clindamycin PLUS quinine (severely ill patients).
Babesiosis - Diagnosis

- Microscopic examination of thick and thin blood films is considered the ‘gold standard’ for diagnosis
- Allows for calculation of percent parasitemia
- PCR is more sensitive

Yes, that’s not uncommon

Does it make sense that no one recalled a tick bite in this case?

Yes, that’s not uncommon
Why Test For So Many Pathogens at Once?

1 tick bite = multiple possible pathogens

Clinical features are not sufficient to differentiate them
Case #2

- 42 year old man living in Minnesota found an embedded tick on his back
- He had initially mistaken it as a ‘skin tag’
- He had been hiking in northern Minnesota the past weekend and estimates that the tick had been attached for at least 2 days
Tick Identification Services at Mayo Clinic

- Parasite Identification (PARID) test ordered:
  - Used for worms, bugs, and anything that looks like these!
  - If the object is an arthropod (i.e. ‘bug’), it is identified to the medically-appropriate level
    - Genus and species for medically-important arthropods

Tick Identification

- Information that we provide:
  - Degree of engorgement
  - Gender and life cycle stage
  - Presence/absence of mouthparts
IDSA Guidelines for Tick Bite Prophylaxis

Tick Bite Prophylaxis

The Infectious Disease Society of America (IDSA) does not generally recommend antimicrobial prophylaxis for prevention of Lyme disease after a recognized tick bite. However, in areas that are highly endemic for Lyme disease, a single dose of doxycycline may be offered to adult patients (200 mg) who are not pregnant and to children older than 8 years of age (4 mg/kg up to a maximum dose of 200 mg) when all of the following circumstances exist:

a. Doxycycline is not contraindicated.
b. The attached tick can be identified as an adult or nymphal I. scapularis tick.
c. The estimated time of attachment is ≥36 h based on the degree of engorgement of the tick with blood or likely time of exposure to the tick.
d. Prophylaxis can be started within 72 h of tick removal.
e. Lyme disease is common in the county or state where the patient lives or has recently traveled, (i.e., CT, DE, MA, MD, ME, MN, NH, NJ, NY, PA, RI, VA, VT, WI).

Antibiotic treatment following a tick bite is not recommended as a means to prevent anaplasmosis, babesiosis, ehrlichiosis, or Rocky Mountain spotted fever. There is no evidence this practice is effective, and it may simply delay onset of disease. Instead, persons who experience a tick bite should be alert for symptoms suggestive of tick-borne illness and consult a physician if fever, rash, or other symptoms of concern develop.

Back to Our Case

• Tick was identified as a Dermacentor variabilis female tick
  • Fully engorged
  • Alive (mouth parts intact)
• Patient was reassured that he was not at risk of acquiring Lyme disease from this tick
• No prophylactic antibiotics were indicated
• He was advised to watch for signs of tick-borne illness (e.g. fever, rash) and see a physician if they appeared.
The Role of Testing Ticks by PCR

- We are occasionally asked to test ticks by PCR to see what they are carrying
- This is NOT a test that we offer
  - Why?
  - Finding a tick on your body does not mean that it:
    - Bit you
    - Transmitted a pathogen
  - The identification, gender, and degree of engorgement of the tick are better indicators for risk of disease

Summary

- There are multiple tick-borne diseases, many of which are clinically indistinguishable
- The preferred test varies by the time that the patient presents in the course of illness
- An algorithmic approach is useful for optimizing laboratory testing, ensuring that all of the necessary tests are ordered, without performing unneeded tests
Questions or requests…
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