



# LYME DISEASE CO-INFECTIONS



# Co-Infections

- Babesiosis
  - Ehrliciosis
  - Bartonella
  - Mycoplasma/Anaplasma
  - And More...
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# “Dirty Tick”

The condition where a tick carries other infections in addition to Lyme Disease, the “Co-Infections.”

The ticks passes on the co-infections along with Lyme Disease.



Requires separate treatment from Lyme Disease Treatment



# Babesiosis

- “A parasitic infection caused by the bite of a tick”  
3
  - More than 13 Species found in ticks <sup>1</sup>
  - ACUTE AND CHRONIC INFECTIONS
- 

# Symptoms Per Turn The Corner <sup>1</sup>

- Acute onset of symptoms
  - Sweats, high fever, chills, headache, dark urine, acute hemolytic anemia which results in jaundice and weakness
  - Severe illness such as renal failure, blood in urine, congestive heart failure, and blood clots in veins and arteries
- Symptoms more severe than expected with Lyme alone
  - Marked night sweats which may cycle every several days
  - Air hunger (not being able to catch a full breath)
  - Cough
  - Severe persistent headaches
  - Unrelenting fatigue
  - Off balance- "tippy", not vertigo or dizziness
- Sweats, fatigue, global headaches, air hunger, cough, hypercoaguable (abnormally thick blood), cycles every few days, rapid onset, very severe Lyme symptoms

# Symptoms per CALDA <sup>2</sup>

- Symptoms of Babesiosis are similar to those of Lyme disease but it more often starts with a high fever and chills. As the infection progresses, patients may develop fatigue, headache, drenching sweats, muscle aches, nausea, and vomiting. Babesiosis is often so mild it is not noticed but can be life-threatening to people with no spleen, the elderly, and people with weak immune systems. Complications include very low blood pressure, liver problems, severe hemolytic anemia (a breakdown of red blood cells), and kidney failure.

# Babesiosis Tests <sup>4</sup>

- B. Microti and/or WA-1 IgG/IgM Antibody
- Babesia and/or Babesia WA-1 PCR
- Babesia FISH (RNA) (for chronic infections)
- If not tested within two weeks of initial infection, smear will be negative because Babesia organisms leave the blood and hide in the body. <sup>1</sup>

# Ehrlichiosis

- “Ehrlichiosis is an infection of white blood cells”<sup>3</sup>
- Less common than the other tick-borne infections<sup>1</sup>
- There are acute and chronic forms
- Acute-
  - Rarely causes a spotted rash
  - Abrupt onset, high fever, muscle pain, headache, low WBC count, elevated liver enzymes
- Chronic-
  - Headaches and muscle soreness
  - Persistent leucopenia (low wbc count)
  - Test with serology, PCR or smear
- Headaches (knife-like), sore muscles, low WBC, elevated liver function tests, rapid onset

# Symptoms Per CALDA <sup>2</sup>

- The clinical manifestations of ehrlichiosis and anaplasmosis are the same. Each is often characterized by sudden high fever, fatigue, muscle aches, headache. The disease can be mild or life-threatening. Severely ill patients can have low white blood cell count, low platelet count, anemia, elevated liver enzymes, kidney failure and respiratory insufficiency. Older people or people with immune suppression are more likely to require hospitalization. Deaths have occurred.

# Ehrlichiosis Tests <sup>4</sup>

- Human Granulocytic Ehrlichia IgG/IgM Antibody
- Human Granulocytic Ehrlichia PCR  
Human Monocytic Ehrlichia IgG/IgM
- Antibody Human Monocytic Ehrlichia PCR

# Bartonella

- “Infections caused by pathogens”<sup>3</sup>
- Like “Cat Scratch Fever” (same family)<sup>1</sup>
- Central Nervous System Symptoms (CNS)
- Encephalopathy
  - encephalitis, irritability, anxiety, insomnia, seizures, gastritis, rashes, tender skin nodules, sore soles, AM fevers, light night sweats
- More CNS symptoms than skeletal symptoms
- CNS irritability, GI, sore soles, subQ nodules (just underneath the skin), AM fevers, gradual onset of illness

# Symptoms Per CALDA <sup>2</sup>

- Bartonellosis is often mild but in serious cases it can affect the whole body. Early signs are fever, fatigue, headache, poor appetite, and an unusual, streaked rash. Swollen glands are typical, especially around the head, neck and arms.
- Dr. Burrascano suspects bartonellosis when neurologic symptoms are out of proportion to the other systemic symptoms of chronic Lyme. He also notes gastritis, lower abdominal pain, sore soles, and tender subcutaneous nodules along the extremities. Lymph nodes may be enlarged and the throat can be sore.

# Bartonella Test and Rash

- Test:
  - Bartonella henselae PCR with Whole Blood <sup>4</sup>
- Bartonella Rash (like Stretch Marks) <sup>1</sup>



# More Rash Examples <sup>1</sup>



# Mycoplasma/Anaplasma

- “Bacterial infections”<sup>3</sup>
- “Chronic fatigue” germ – immune system is fighting something<sup>1</sup>
- Test for Mycoplasma with a blood PCR test. If it's positive, that means that Mycoplasma infection is active.
- Its origin or source is unclear
- Very difficult to detect
- More often seen in the immuno-suppressed
- Test with serial PCRs (still insensitive)

# Mycoplasma / Anaplasma Tests

- Test with serial PCRs
- Per CALDA <sup>2</sup>:
  - Mycoplasma species have been identified in ticks. Smaller than bacteria, they invade human cells and disrupt the immune system, causing fatigue, musculoskeletal symptoms, and cognitive problems. Mycoplasmas can be treated with antibiotics.

# Other Potential Infections <sup>1</sup>

- Chlamydia – Recent tests show that ticks can carry Chlamydia. This is a different form of the illness which occurs in the eye and is different from the one that causes genital infections.
- Viruses
  - HHV-6, CMV, other herpes
- Yeasts
- Q-fever
- Others exist, but are unknown



# Lyme and Co-Infections Chart (From CALDA) <sup>2</sup>

See handout



# Resources

- ILADS (International Lyme and Associated Diseases Society)
  - <http://www.ilads.org/>
- Turn The Corner
  - <http://www.turnthecorner.org/>
- Under Our Skin (documentary on Lyme)
  - <http://www.underourskin.com/>
- CALDA (California Lyme Disease Association)
  - <http://lymedisease.org/>

# Resources Used for This Presentation

- <sup>1</sup>Turn the Corner
  - From Their LEADS Slideshow
- <sup>2</sup>CALDA Website
  - Symptoms
- <sup>3</sup>WebMD
  - Definitions
- <sup>4</sup>ILADS Paper by Dr. Nick Harris (IGeneX)