Lyme Disease and Coinfections

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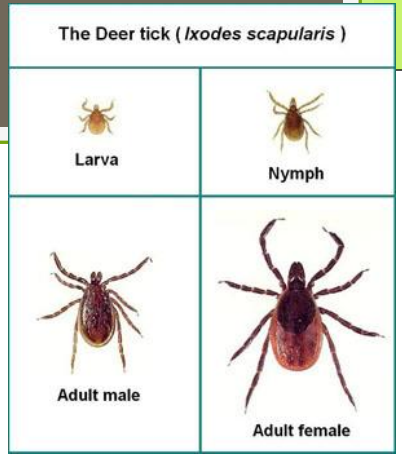
COINFECTION



Two or more pathogens acquired from tick exposure

- Can hide for decades in the body.
- May have systemic impacts on the body that may not occur for days, weeks, months, years or decades after the bite.
- Symptoms may occur gradually. May be triggered by a stressful event….a car accident, an illness, surgery, vaccinations, or an emotional stressor
- Can cause multisystem illness involving skin, nervous system, heart, joints, eyes, and other organs.
- May cause profound immune suppression abnormalities.
- May be spread by any of the three major species of ticks: Ixodes (includes deer ticks) Amblyomma (includes lone star ticks) and Dermacentor (includes the American dog tick).
- Some researchers believe other biting insects may also transmit infection: mosquitos, fleas, biting flies, and lice. Spirochetes are found in many body fluids.

- 70 % of emerging infectious diseases are zoonotic which means transmitted from animals to humans.
- Vectors such as fleas, ticks and lice and biting flies play an important role in transmitting zoonotic diseases.
- Fleas are actually the most common vector for transmission of Bartonella.

COINFECTIONS

- Bartonella
- Babesia
- Ehrlichia and Anaplasma
- Mycoplasma
- Rocky Mountain Spotted Fever
- Powassan Virus

"LYME DISEASE HAS BECOME A FACT OF LIFE FOR ALL CITIZENS OF WISCONSIN"

Lyme disease: A clinicians guide, Wisconsin State Department of Epidemiology,1989.

CLASSIC LYME SYMPTOMS

- Gradual onset of flu like symptoms
- Multisystem- usually more than one at a time. Nervous system, Lymph nodes, Musculoskeletal, respiratory, Liver, Kidneys, Eyes, Testis, Spleen, skin.
- Migratory Pain
- Stiff joints and crepitus, especially in neck
- Headaches often nuchal associated with stiff, painful and crepitant neck
- Fatigue and limited stamina
- Four week cycles


Rash after lone star tick bite
Ed Masters, MD

TREATMENT

- Ceftin, Cefdinir
- Azithromycin, Clarithromycin
- Doxycycline 200mg BID (Bactericidal dose)
- Metronidazole and/or Tindamax
- Amoxicillin and Probenecid
- IM Penicillin, IM Bicillin
- IV antibiotics: Rocephin

BARTONELLA LIKE ORGANISMS (BLO)

- Possibly the most common of all tick-borne pathogens.
- This strain seems to be different than the strain that causes “cat scratch fever”.
- In patients who fit the clinical picture, standard Bartonella testing is commonly non-reactive.
- Typical Bartonella meds may suppress symptoms but not clear them.
- Symptoms involving CNS out of proportion to other systemic symptoms of Lyme disease.

Bartonella Symptoms- Increased irritability to the CNS

- Gradual onset of symptoms
- Obvious signs of CNS irritability can include agitation, severe mood swings, outbursts, antisocial behavior, anxiety, insomnia, muscle twitching tremors, seizures, hallucinations
- Headaches
- Gastritis, lower abdominal pain (mesenteric adenitis)
- Sore soles especially in the morning
- Tender subcutaneous nodules along extremities
- Red rashes…red streaks like stretch marks that do not follow skin planes, spider veins, or red papular eruptions.
- Enlarged lymph nodes, sore throat
- Standard testing, either PCR or serology, may not pick up.
- May be transmitted across the placenta

Martin Fried, MD

- Pediatric gastroenterologist published findings: "Infections of the GI Tract in Children and Adolescents"
- 81 children with chronic intestinal problems- Endoscopy and colonoscopy. Looked for areas of inflammation and tested tissue for tick borne diseases (all children had prior exposure to ticks)
- 35 had Bartonella Hensalae
- 24 had Mycolplasma fermentans
- 14 had Heliobacter pylori
- 13 had B. burgdorferi

DRUGS OF CHOICE

- Levofloxicin and other floroquinolones: Ciprofloxicin, Avelox
- Rifampin
- Gentamicin
- Combine with cephalosporin's, penicillin's, Bactrim

BABESIA

- Studies in the Northeast:10%-32% of Lyme patients also have Babesia
- Rapid onset of initial symptoms, high fever, severe headaches, sweats and fatigue
- Sweats at night and day
- Air hunger, dry cough with no apparent reason
- Headaches- can be severe-dull, global (feels like head is in a vise)
- Fatigue-does not clear with rest worse with exercise
- Mental dullness and slowing of reactions and response
- Dizziness- more like tippy feeling
- Symptoms typically cycle rapidly every four to six days
- Hypercoaguable states often associated with Babesia
- Very severe Lyme disease can be a clue to Babesia infection, as it will make Lyme symptoms worse and Lyme treatment less effective.

TREATMENT

- Mepron- 750mg/5ml two teaspoonful's twice daily and Azithromycin or clarithromycin
- Malarone
- Artimesinin
- Clindamycin
- Quinine
- Coartum

TESTING

- There are tests for Babesia microtti and duncani but not the other strains. Babesia live inside red blood cells and could pose a problem for blood banks.

EHRLICHIA/ANAPLASMA

- Usually sudden onset
- Abrupt fatigue or collapse
- Chills and high fever
- Headaches often knifelike and behind the eyes
- Muscle pain, not joint pain
- Low WB, Low platelet count, Elevated Liver enzymes
- Rapid response to treatment
- Treatment: Must use doxycycline or minocycline (regardless of age of child).

MYCOPLASMA INFECTIONS

- No cell wall and lives inside other cells. Can overact the immune system or suppress it.
- Fever, fatigue, joint pain, muscle pain, insomnia, headache, anxiety, emotional liability, poor memory, poor concentration, decreased attention, confusion

DIAGNOSIS AND TREATMENT

- Does not grow well in culture
- MDL has developed a Mycoplasma antibody test and PCR test
- Difficult to eradicate
- In test tubes fluoroquinolones kill it
- Levofloxacin, moxyfloxacin, ciprofloxacin, avelox
- Rifampin with Azithromycin or Bactrim
- Tetracycline's with Azithromycin or Clarithromycin

ROCKY MOUNTAIN SPOTTED FEVER

- Can be severe or even fatal illness if not treated in the first few days of infections.
- Fever, headaches, abdominal pain, muscle pain, muscle wasting, vomiting, a rash may develop but in most never does
- Doxycycline is first line treatment for all ages, including children, and most effective if given in the first 5 days. 4mg/kg for children
- CDC says it is a clinical diagnosis and may be confirmed by serological testing.
- Between 1981 and 1996 it was reported in every state except Hawaii, Vermont, Maine and Alaska

RMSF RASH

CHILDREN WITH LYME DISEASE

- Children with gestational, breast milk and early exposure to Lyme often experience:
- Tactile, hair, light and sound sensitivity
- Reluctance to play
- Heat and cold intolerance
- Irritability and weepiness
- Impaired short term memory
- Slow development
- "Failure to thrive"
- GI issues- nausea, vomiting , GERD, Abdominal pain, diarrhea or constipation

CHILDREN WITH LYME DISEASE

- Headaches
- Sleep disturbances
- Increased nightmares and upsetting dreams
- New onset bedwetting or encopresis
- Joint and body pain
- New onset asthma
- Decreased appetite
- Weepiness

CHILDREN WITH BARTONELLA

- New onset psychiatric problems including:
- Rage
- Anxiety
- Paranoia
- Cutting
- Hallucinations
- Learning disabilities
- Headache, striae

CHILDREN WITH BABESIA

- Significant joint pain
- Sweats
- Night terrors
- Frontal Headaches
- Chills
- Fatigue

Powassan Virus

- Most cases have been reported in the Northeast and Great Lakes region per CDC.
- Affects the CNS causing swelling of the brain and spinal cord. Fever, headache, vomiting, weakness, confusion, seizures, memory loss.
- Long term neurologic problems may occur.
- Currently there is no known treatment, but people with severe symptoms need to be hospitalized to receive respiratory support, IV fluids, or medications to reduce swelling in the brain.

WHAT WE DON'T KNOW

- Can ehrlichia and anaplasmosis become chronic in humans as it is in dogs?
- What is the role of other strains of Babesia, Bartonella and Mycolplasma? There are some 20 strains of both we have no tests for.
- What are the symptoms of Bartonella and Mycoplasma without Lyme disease?
- There are areas in the Northeast where 90-95% of the ticks carry Lyme disease. Could that be possible in areas near us?
- In Europe mosquitos have been found to carry Lyme, but have not proven they can transmit it.

- Whether there is transmission by vectors other than ticks is controversial. Non-vector borne transmission, such as sneezing or sexual transmission is also controversial. We don't know whether the coinfections can be transmitted sexually. Lyme bacteria have been found in semen and vaginal secretions. We do know Lyme and Babesia can be transmitted transplacentally and Lyme has been found in breast milk.

- Treatment options for Lyme disease are limited. Antibiotics are the only demonstrated effective form of treatment. Although some physicians believe that symptoms which persist in chronic Lyme after short-term treatment reflect an autoimmune response without active infection, there are no studies to support this hypothesis, there is no test that can prove eradication of the bacteria from the body, and there is a wealth of studies in which the bacteria have been isolated in patients with persistent symptoms post treatment.

PREVENTION

- Stay away from wooded areas and areas with tall grass. The ticks do not die in winter but have a two year life cycle.
- Pull your socks up over your pants.
- Do thorough tick checks twice daily.
- If you must be in the woods, remove your clothing outside.
- Wear clothing treated with permethrin; such as the Insect Shield line, or do it yourself. Visit the National Pest Information Center (NPIC) to learn more about using permethrin. npic@ace.orst.edu

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