

Lyme Disease and Co-Infections

The Hidden Pandemic

Dr. Jason Bachewich ND

www.thenaturedoctors.ca

www.lymedoc.net



LEARNING OBJECTIVES

- ◆ What is an ND?
- ◆ Walking wounded – why this is important!
 - ◆ Bacteria and viral reactivation.....
- ◆ Learn to spot the clinical pictures of infection
- ◆ Referral Options

Naturopathic Medicine?

- ◆ A science-based healthcare approach that assesses and treats underlying causes of illness through individually tailored therapies to restore health and improve function
- ◆ **The primary goal of naturopathic medicine is to address the root cause of illness, rather than treat or suppress symptoms.** An ND takes the physical, mental, emotional and spiritual dimensions into account when diagnosing and developing a treatment plan.
 - ◆ MD vs. ND

Education

- ◆ Undergraduate Pre-Medical Degree
- ◆ 4 Years Post Graduate Medical Training with 1 year of primary care residency
- ◆ Curriculum is comprised of standard medical training as well as modalities listed on previous slide
 - ◆ Eg. Labs, Xrays, Blood tests, Drugs

Modalities?

- ◆ Botanical Medicine
- ◆ Intravenous Therapies/ Injections
- ◆ Lifestyle Counseling
- ◆ Nutraceuticals
- ◆ Medically directed dietary plans
- ◆ Acupuncture and Chinese Medicine
- ◆ Naturopathic Manipulations
- ◆ Blood labs / Prescription Meds



Insurance

- ◆ Covered by most 3rd party insurance – limited amount
- ◆ First appointments generally around \$250 – 1.5 hour appt

Lyme Disease

And Co-Infections





Otzi – Iceman

- 5300 years ago
- Oldest patient with Fibromyalgia
- Found 2/3rds of the genome for Lyme

www.iceman.it

Momentum.....

Lyme in Canada

2009 – 144 cases - human

2010: 143 cases

2011: 266 cases

2012: 387 cases

2013: 682 cases

2014: 522 cases

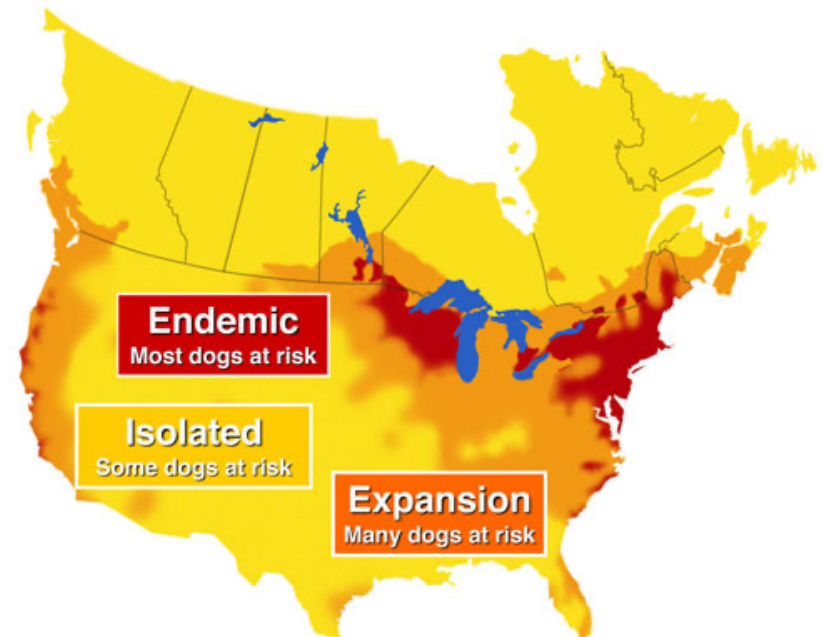
2015: 917 cases

2016: 992 cases

2017: 2025 cases

◆ 3943 confirmed cases in dogs in Canada in 2017

www.deerbusters.ca



The Bite.... Stage 1

1. **Transmission of Borrelia during tick bites:** After 5 to 7 days, latest 7 to 11 weeks development of a **Bulls eye rash/Erythema migrans**
2. 20 % of infected patients develop a **feverish reaction** because of the **penetration of Borrelia into the blood (only for a few days) (summer flu)**
3. **Only 30-40 % of Lyme patients develop a Bulls eye rash**
4. **Only 30-40 % of chronic Lyme patients remember a former tick-bite**

Only 18.5% of kids with Lyme remember a bite...

Ticks Tick Borne Dis. 2019 Apr;10(3):694-696. doi: 10.1016/j.ttbdis.2019.02.015. Epub 2019 Feb 26.

A minority of children diagnosed with Lyme disease recall a preceding tick bite.

Nigrovic LE¹, Neville DN², Balamuth F³, Bennett JE⁴, Levas MN⁵, Garro AC⁶; for Pedi Lyme Net.

Author information

Abstract

Of 1770 children undergoing emergency department evaluation for Lyme disease, 362 (20.5%) children had Lyme disease. Of those with an available tick bite history, only a minority of those with Lyme disease had a recognized tick bite (60/325; 18.5%, 95% confidence interval 14.6-23.0%). Lack of a tick bite history does not reliably exclude Lyme disease.

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PMID: 30853264 DOI: [10.1016/j.ttbdis.2019.02.015](https://doi.org/10.1016/j.ttbdis.2019.02.015)



www.webmd.com





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Stage 2 & 3

1. Symptoms start 2 - 12 weeks after transmission of *Borrelia burgdorferi* by tick bite
 2. Symptoms can develop...
 - peripheral nerve system
 - central nerve system
 - joints/tendons
 - heart
 - eyes, bladder etc.
-
- ◆ Stage III (Chronic organ manifestation):
 - ◆ Longer than 1 year persisting symptoms

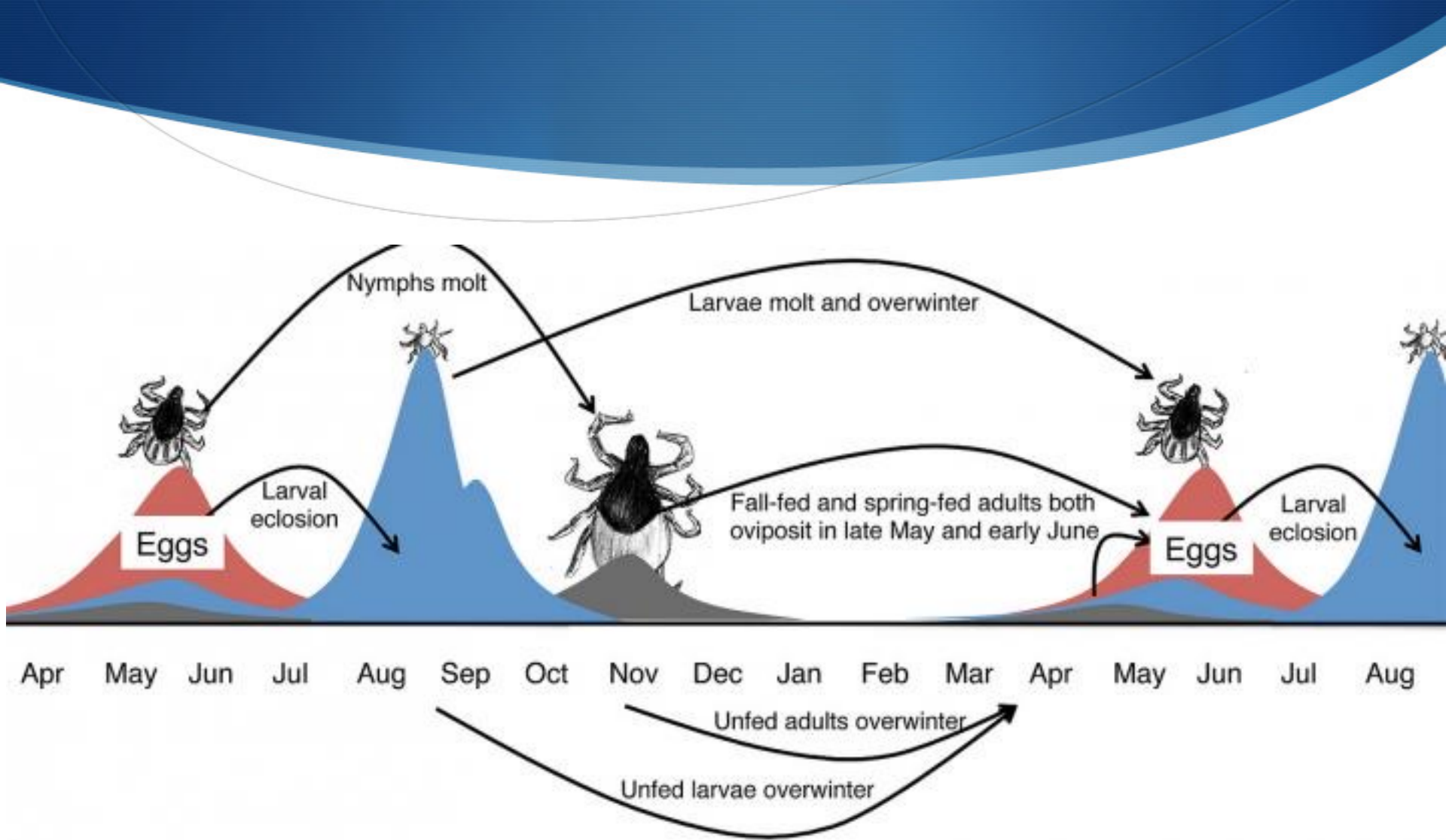
Symptoms.... Stage 3

Power loss or reduction (mental/physical) at work, household, sport	>99 %
Fatigue/ Drowsiness/Listlessness	>99 %
Tingling/"Ants running"/Numbness/ „Needle burning“ or „burning“ skin-sensations	81 %
Neck pain/ neck stiffness	78 %
Shoulder pain	76 %
Headache/Dizziness	76 %
Changing, migrant joint pain (all joints are possible)	68 %
Changing, migrant muscle pain/"Rheumatism"/General weakness of the body	62 %
Feverish infection: in Stage I of Lyme disease as a sign for occurrence of borrelia-bacteria in blood	≈20 %
Mental strain/Depressions/Schizophrenia/Psychosis	62 %
Back pain/Sciatic pain syndrome	58 %
Sleeplessness with partly sweating/urge to urinate mostly between 2 and 4 o'clock at night	47 %
Sore throat/Tendence for general infections/HSV or EBV-Infections	39 %
„Burning eyes“/Overproduciton of tears/Blurred vision/Double vision/Lightheadedness	28 %

Time to Unlearn.....

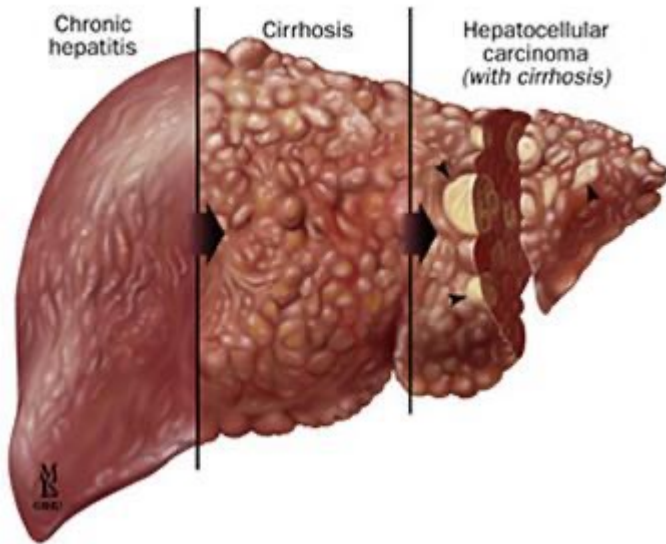








Courtesy of bbc.com



www.findatopdoc.com



www.researchgate.net

What do we need to look for?

- ◆ Symptoms unrelated to seasons, environment
- ◆ Quick onset
- ◆ Onset can be after physical or emotional trauma
- ◆ Stress makes worse but holidays do not relieve
- ◆ Better in the summer
- ◆ Have seen every specialist, clean MRI etc.....

The great mimicker

20-30% of autistic disorders can be caused by Borrelia and 58% by Mycoplasma
(Bransfield et al.: *Med Hypotheses*.2008; 70(5):967-74)

Multiple Sclerosis, myelopathies, polyneuropathies, brain tumor, encephalopathy.
(*Neurosurgery*.1992May;30(5):769-73)

Can cause meningitis, encephalitis, neuritis, mania, depression, schizophrenia, anorexia, dementia.
(*Am J Psychiatry*. 1994 Nov;151(11):1571-83)

◆ **"Most fibromyalgia patients are Lyme positive."**
(*Rheum Dis Clin North Am*. 1998 May;24(2):323-51 & report of Lida Mattman,M.D.)

"Borrelia can cause Parkinsonism"
(*Arch.of Path.& Lab.Med*.127(9):1204-6)

◆ **"90% of chronic fatigue patients are Lyme positive."**
(Informal study by American Lyme Disease Alliance at www.lymealliance.org)

◆ **Pure Lyme dementia exists and has a good outcome after antibiotics. It is advisable to do Lyme serology in demented patients.**
(Blank et al.: *Journal of Alzheimer's disease*, Volume 4/2014, 1087-1093)



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Autoimmune Diseases

Volume 2012 (2012), Article ID 539282, 9 pages

<http://dx.doi.org/10.1155/2012/539282>

Review Article

Autoimmunity in Rheumatic Diseases Is Induced by Microbial Infections via Crossreactivity or Molecular Mimicry

Taha Rashid and Alan Ebringer

Analytical Sciences Group, Kings College London, 150 Stamford Street, London SE1 9NN, UK

Received 2 September 2011; Accepted 1 November 2011



[Clin Vaccine Immunol.](#) 2007 Nov; 14(11): 1437–1441.

PMCID: PMC2168181

Published online 2007 Sep 19. doi: [10.1128/CVI.00151-07](https://doi.org/10.1128/CVI.00151-07)

Serum Reactivity against *Borrelia burgdorferi* OspA in Patients with Rheumatoid Arthritis[▼]

[Yu-Fan Hsieh](#),¹ [Han-Wen Liu](#),¹ [Tsai-Ching Hsu](#),¹ [James C.-C. Wei](#),² [Chien-Ming Shih](#),³ [Peter J. Krause](#),⁴ and [Gregory J. Tsay](#)^{1,2,*}

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ABSTRACT

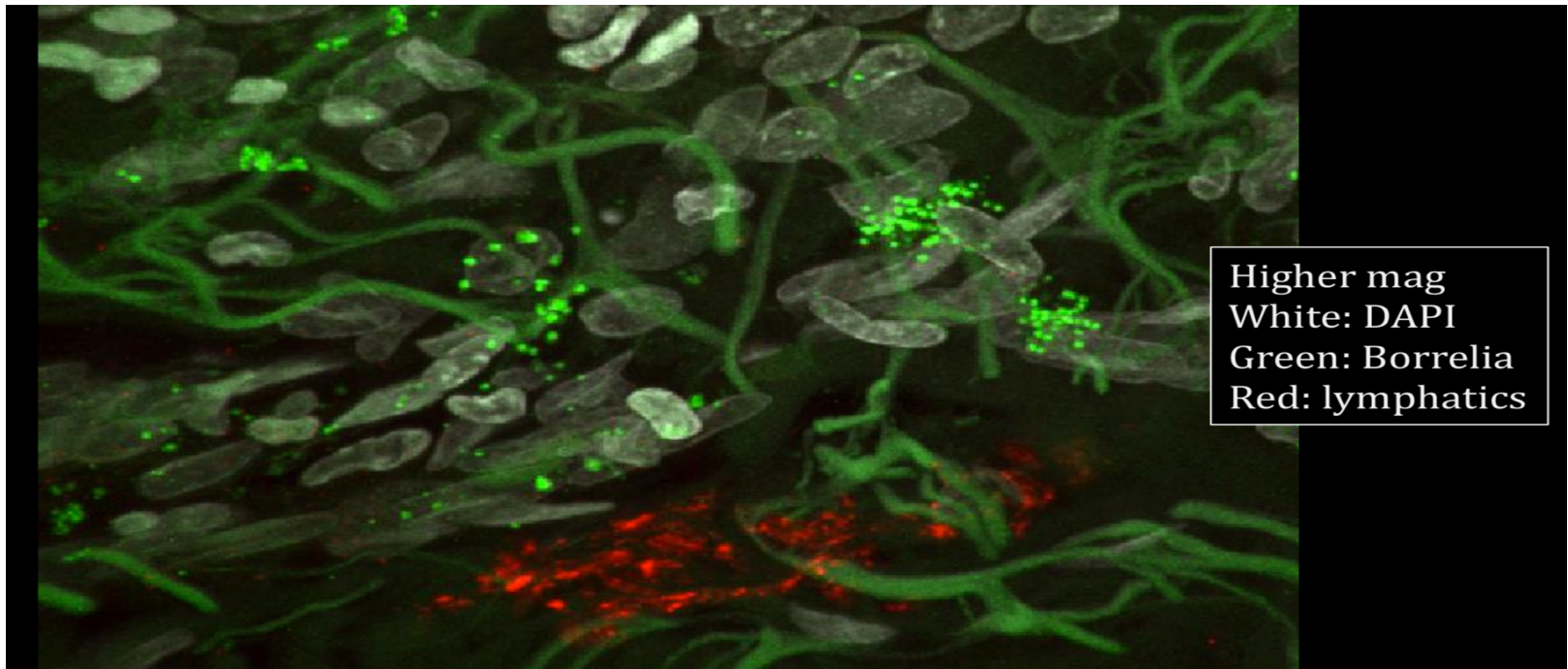
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Lyme arthritis and rheumatoid arthritis share common clinical features and synovial histology. It is unclear whether they also share similar pathogenesis. Previous studies have shown that the severity and duration of Lyme arthritis correlate directly with serum concentrations of antibody against outer surface protein A (OspA) of the causative pathogen *Borrelia burgdorferi*. We tested the sera of 68 subjects with rheumatoid arthritis, 147 subjects with other autoimmune diseases, and 44 healthy subjects who had never had Lyme

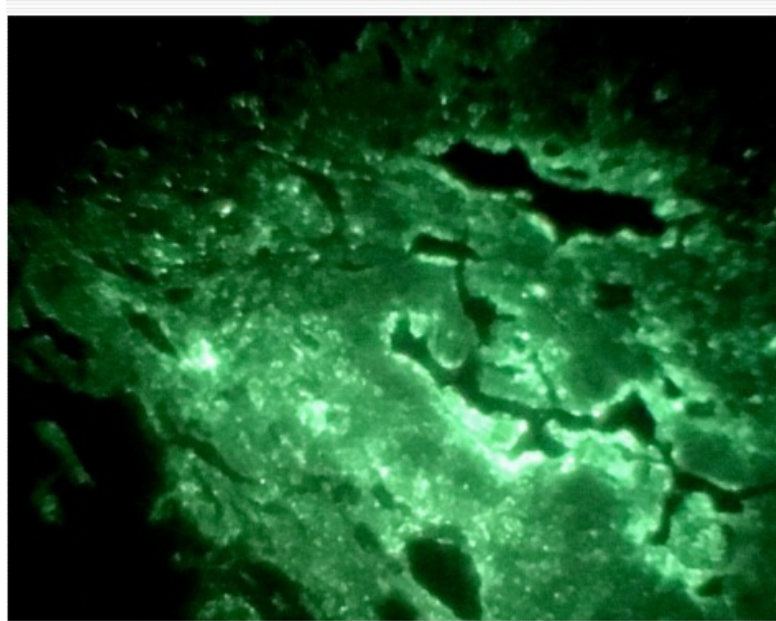
Melanoma and Lyme

Marna Ericson, PhD

University of Minnesota Medical School



Brain Cancer and Lyme?



Glioblastoma Multiformae Brain Biopsies - Formalin fixed- with Immunohistochemical Full Panel evaluation and Confirmation of Diagnosis by neuropathologist- --- Images (3 per case) of FISH DNA probe for detection of Burgdorferi Borrelia DNA with DNA probes specific for gene of Inner cell membrane of Burgdorferi Borrelia Gene bbo 0740- Validated DNA probe and all Controls acceptable

Alan MacDonald, M.D., FCAP, Copyright, year 2016 January, all rights reserved

“In the case of neurons, glial cells and Borrelia, there is evidence from co-incubation of cells in tissue culture with living Borrelia in pure cultures that Borrelia first binds to the tissue cultured cells, and then, stepwise, inserts the entire spirochete into the cytoplasm and then into the nucleus of glial cells. Liposomes from Borrelia's outer surface membrane contain DNA. Transmission electron micrographs have imaged the transit of Borrelia liposomes from the external cellular milieu, to penetrate the cytoplasm of eukaryotic cells, and next to penetrate the nucleus.”

Source: Alan MacDonald, M.D., FCAP, Copyright, Jan. 2016, <https://durayresearch.files.wordpress.com/2016/01/report-for-gbm-cases-five-with-fish-probes.pdf>; <https://www.lymeneteurope.org/forum/viewtopic.php?t=6048>

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[Int J Gen Med](#). 2012; 5: 163–174.

PMCID: PMC3292400

Published online 2012 Feb 22. doi: [10.2147/IJGM.S24212](https://doi.org/10.2147/IJGM.S24212)

Lyme disease and pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS): an overview

[Hanna Rhee](#)¹ and [Daniel J Cameron](#)²

[Author information](#) ▶ [Copyright and License information](#) ▶

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Pavone P, Parano E, Rizzo R, Trifiletti RR. J Child Neurol. 2006 Sep; 21(9):727-36.

Abstract

Lyme disease (LD) is a complex, multisystemic illness. As the most common vector-borne disease in the United States, LD is caused by bacterial spirochete *Borrelia burgdorferi* sensu stricto, with potential

To complicate this more:

- ◆ Contamination of ticks in Switzerland: Current data
- ◆ 25 % free of pathogens
- ◆ 32 % *Borrelia*
- ◆ 1 % *Ehrlichia/Anaplasma*
- ◆ 42 % *Rickettsia helvetica* (causes myalgia, pericarditis)
- ◆ 17 % have BOTH! *Rickettsia* and Lyme
- ◆ Source: Lecture Prof. Sievers, Hochschule Wädenswil, 5th Apr. 2008 Bad Soden-Salmünster

In Manitoba:

50% of Lyme carrying ticks ALSO carry
Anaplasma/Erlichia

Source: Health Sciences Centre - Winnipeg

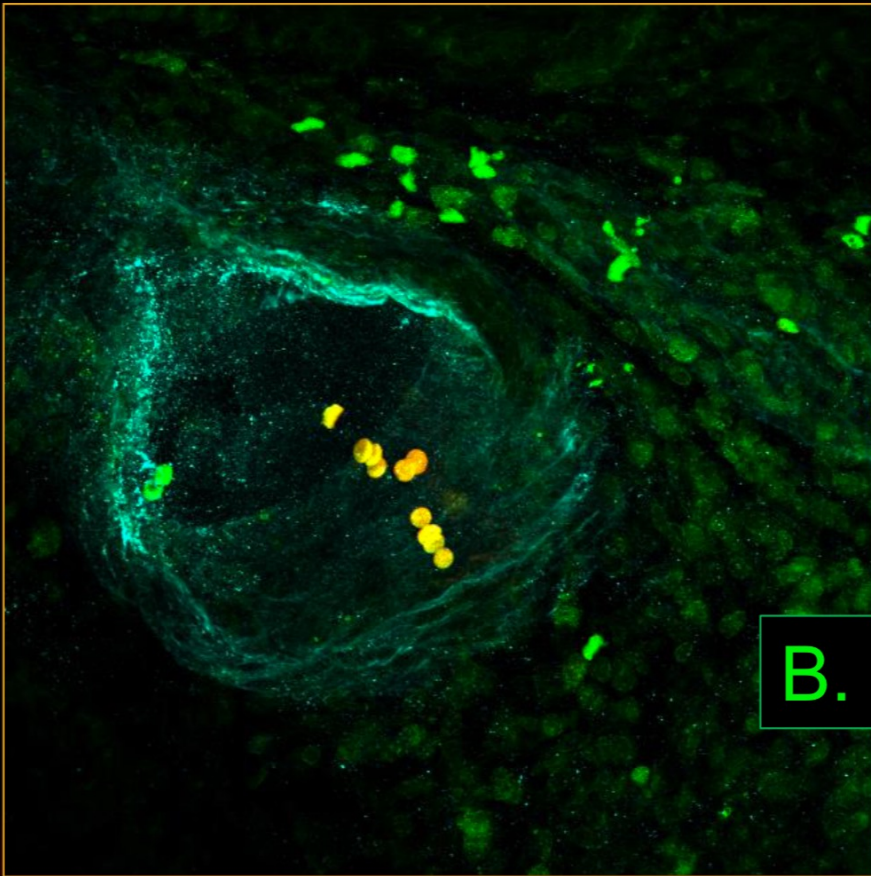
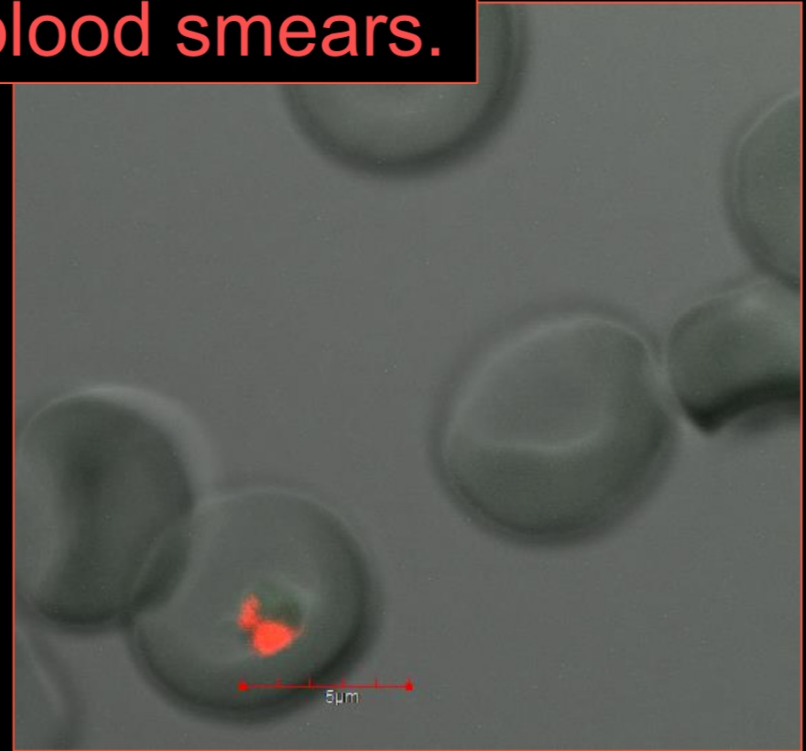


Bartonella – cat scratch

- ◆ Tiredness
- ◆ Headaches
- ◆ Muscle twitch, tremor, seizures
- ◆ Fever in the mornings
- ◆ Mood swings
- ◆ Striae
- ◆ Can lead to: endocarditis, retinitis, epilepsy, aseptic meningitis, liver and spleen enlargement
- ◆ Found in Ticks, fleas, mosquitoes and sand flies



B. henselae in blood smears.



B. henselae in human appendix

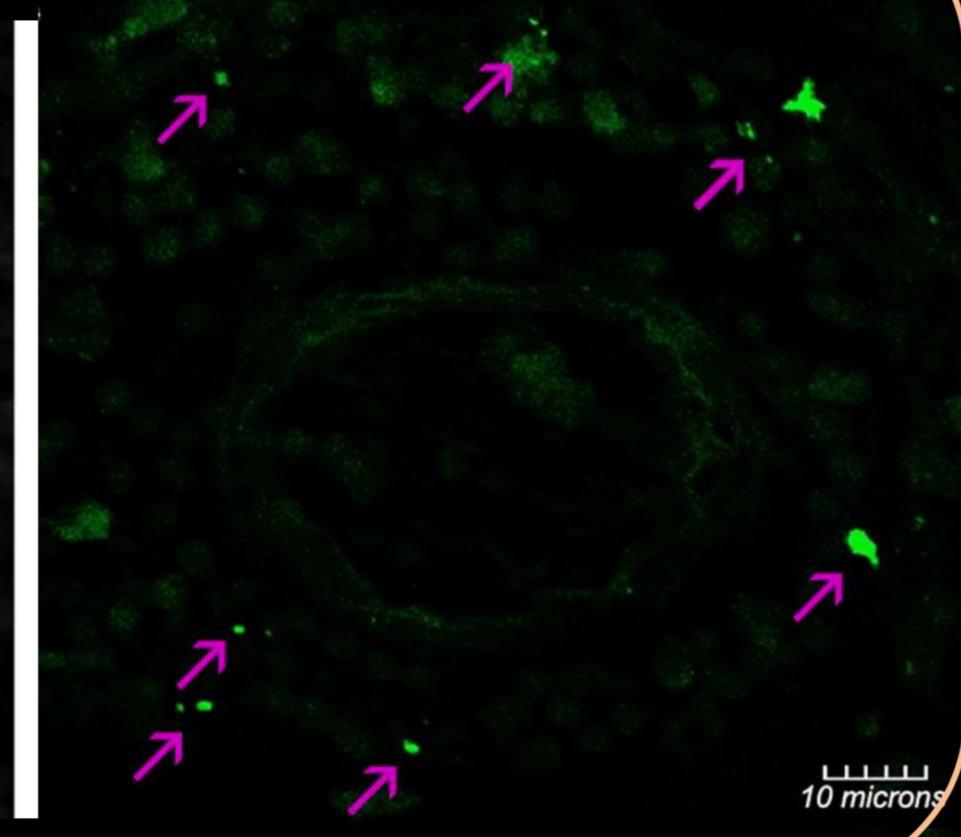
SHORT REPORT

Open Access



Vasculitis, cerebral infarction and persistent *Bartonella henselae* infection in a child

Vandhakumar Balakrishnan¹, Marna Ericson², Ricardo Maggi¹ and Edward B. Breitschwerdt^{1*}



BRAIN

Babesia

- ◆ Rapid onset with fever
- ◆ Headache – whole head
- ◆ Sweats
- ◆ Temperature control
- ◆ Air hunger
- ◆ Stiff neck
- ◆ Tired, Dizzy and mentally dull
- ◆ Stomach pains

Rickettsia

- ◆ Fever
- ◆ Nausea, vomiting
- ◆ Severe Headache
- ◆ Swollen lymph nodes
- ◆ Skin rash

Chlamydia pneumoniae

- ◆ Ears, nose and throat
- ◆ Brain symptoms
- ◆ Arthritis
- ◆ Tendovaginitis

- ◆ Assoc – alzheimer's, MS, Depression, Fibro, Heart attacks and strokes, parkinsons, autism, RA

Mycoplasma pneumoniae

- ◆ Airborne, human contact – ticks?
- ◆ Fatigue
- ◆ Joint pain and swelling
- ◆ Muscle pain
- ◆ Headache
- ◆ Insomnia, Anxiety
- ◆ Memory loss
- ◆ Assoc – Autism, ALS, Gulf War Syndrome, Encephalitis

Provincial Testing

- ◆ C6 Elisa IgG, IgM – recommended to wait 14 days before testing
- ◆ Tests 3 strains
- ◆ If positive, referred to National Microbiology lab:
 - ◆ IgM Western Blot – 3 strains
 - ◆ IgG Western Blot – 1 strain (only test all three if requested and patient has travelled outside of N. America)
 - ◆ PCR – Blood 10-18% sensitive (lower in treated individuals)

Private Testing

- Germany – leaders
- United States
- Blood draws on Mondays and Tuesdays

**"Chronic Lyme disease" is an
multi infectious disease
at a immuno-
weakened
host**

Symptom selection

	Borrelia	Chl. pneumoniae	Chl. trachomatis	Mykoplasma	Bartonella	Ehrlichia	Rickettsia	Yersinia	Babesia	EBV virus	Coxsackie virus
limbs, tendon pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
muscle pain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
joint pain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
memory- concentration problems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
headache	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
nausea, vomiting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
encephalitis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
fatigue, exhaustion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
feverish feeling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
chills, tremors	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
flu symptoms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
stomach ache	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
diarrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
jaundice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Increased liver values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
enlargement of the spleen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
dark urine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
urination with itching	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
deteriorated seeing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
heart problems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
cough	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
pneumonia	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
anemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Skin bleeding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
lymphadenopathy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
suppurating tonsils, dental probl.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Viral Reactivation?



EBV

- ◆ “kissing disease”
- ◆ Fatigue, fever, nausea, swollen lymphatics, rash, sore throat, sore muscle
- ◆ * chronic fatigue
- ◆ Complications:
 - Swollen Liver/Spleen
 - Non Hodgkin Lymphoma
 - Thyroid disease

Cytomegalovirus

- ◆ Fatigue, fever, swollen lymph
- ◆ Complications:
 - ◆ Colitis
 - ◆ Artherosclerosis
 - ◆ Esophagitis
 - ◆ Hepatitis
 - ◆ Pneumonitis
 - ◆ Assoc. with Non-Hodgkin's Lymphoma

Coxsackie

- ◆ Hand foot mouth (sore throat, cough, fatigue, headache, night sweats, conjunctivitis)
- ◆ Complications:
 - CNS disease - flaccid and spastic paralysis
 - Diabetes
 - Aseptic Meningitis
 - * chronic fatigue syndrome...

Are antibiotics enough?

- ◆ Typically if given quick, 2-3 weeks of doxycycline with clear up most Lyme infections
- ◆ Co – Infections may be missed
- ◆ If medications not given until Stage 2 or 3, you may need multiple meds for many months, including integrative supportive treatments to minimize side effects.

Prevention

Chemicals

- ◆ DEET / Mosquito Sprays shown most effective
- ◆ Essential oils – work but need to be applied more often
- ◆ Best to apply to clothing and not skin especially in children

Physical Barriers

- ◆ Wear long pants and socks
- ◆ Tuck pants into socks or wear high boots / rubber boots
- ◆ Wear light colored clothing to see them better
- ◆ Assume nothing – always strip

Proper Removal

- ◆ Grab tick with tweezers as close to head / skin as possible
- ◆ Pull back gently in the opposite direction of the bite
- ◆ **KEEP THE TICK** – if attached to you. In a ziplock, ticks can survive for months.
- ◆ Tick testing – is around \$150 but faster turn around time

Key Take Home Points

- ◆ If the tick is attached, assume transmission can occur
- ◆ ANY time of the year – unusual symptoms – get tested
- ◆ Weird pain, sensations, headaches, muscle or joint pain, heart issues, brain fog or fatigue – get tested
- ◆ Be diligent – Lyme disease is the ultimate mimicker



Dr. Jason Bachewich ND

Dr. Mary Anne Hembroff ND

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