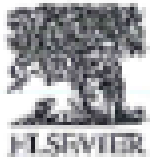


Lyme Disease and Biotoxin Illness

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Original article

Transmission of *Borrelia burgdorferi* and other cells by an *in vitro* model

“Human infection by *Borrelia burgdorferi*, the etiological agent for Lyme disease, can result in serious acute and late-term disorders including neuroborreliosis, a degenerative condition of the peripheral and central nervous systems”

Received 17 June 2006; accepted 20 August 2006
Available online 19 November 2006

“In all neural cells tested, we observed *B. burgdorferi* in association with the cell”

Human infection by *Borrelia burgdorferi*, the etiological agent for Lyme disease, can result in various acute and late-term disorders including neuroborreliosis, a degenerative condition of the peripheral and central nervous systems. To examine the mechanisms involved in the cellular

“Invasion of neural cells by *B. burgdorferi* provides putative mechanisms for the organism to avoid the host’s immune response while potentially causing functional damage to neural cells during infection of the CNS”

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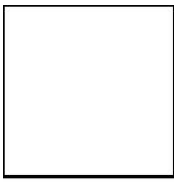
Keywords: *Borrelia burgdorferi*; Cell invasion; Neuroborreliosis

Overview

- ▶ Background
- ▶ Our Goals
- ▶ Definitions
- ▶ Incidence
- ▶ Testing
- ▶ Treatment

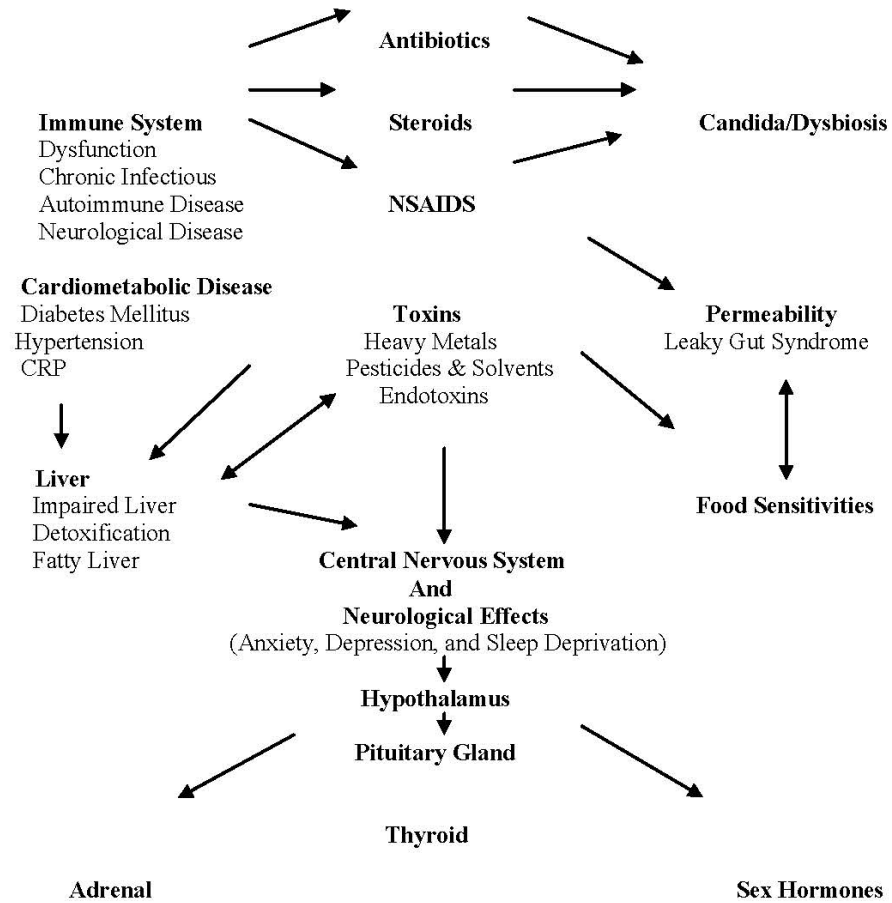
Background

- ▶ MD experience
- ▶ ND schooling
- ▶ Integrative Approach
- ▶ Web of dysfunction-See handout
- ▶ Creating Foundation GI health,
Hormones Liver support and detox



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Web of Dysfunction



Our Goals

- ▶ Optimize health
- ▶ Identify the possible causes
- ▶ Lyme questionnaire -typical symptoms
- ▶ Support before killing bacteria, Lyme or other pathogens
- ▶ CFS, Fibromyalgia, Mystery diagnosis, POTS, unusual fevers Dysautonomia, MS, Chronic pain syndrome, Chronic migraines, Chronic Psychiatric diagnoses with poor response to meds

Definitions and Players

- ▶ Multitude of symptoms
- ▶ Failure of Non LLMD
- ▶ ILADS vs IDSA
- ▶ Biotoxin page handout
- ▶ Three B's Borrelia, Babesia and Bartonella
- ▶ Co-infections, Viruses and Parasites
- ▶ Additional contributing factors Stress, GI health, Hormonal health, genetics, Mold exposure,



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Biotoxin Illness

Many organisms produce a variety of different chemicals that we call **biotoxins** that can cause a toxic response in humans if ingested, inhaled, or if contact is made with the skin. These may include heavy metals, Lyme (*Borrelia*), molds and fungus, viral and bacterial infections, Staph, parasites, certain spiders (e.g. recluse), Botox, food preservatives, dental compounds, and even toxins from significant stress. Many biotoxins are neurotoxic, which means that they can impact our brain and nervous system as they travel throughout our bodies, causing harm.

Biotoxins are capable of disrupting vital bodily functions of the nervous system/nerve cells, including DNA transcription, nutrient transport, and mitochondrial respiration (i.e. degeneration of energy/pervasive fatigue). They are able to dissolve into fatty tissue and move through cell membranes, since membranes are 50% lipid (fat). They have the ability to disrupt the sodium and calcium channel receptors as well as disrupting the electrostatic function of the cell and cell signaling throughout the body.

Mycotoxins are chemicals produced by organisms of the fungus kingdom; it is their means of protection and survival. Hundreds of mycotoxins exist. In the human body, they can cause a toxic response, affecting the immune system, nervous system, sleep cycle, liver and kidney functions, bleeding and blood clotting. A significant portion of the population lacks the genetic infrastructure to effectively bind these mycotoxins in the body so that they continue to cycle and cycle creating inflammation and swelling in an on-going cycle. Mold illness is not simply an allergy; it is the inability to effectively remove these toxins from the body.

An important note to remember is that **Biotoxin illness equates directly to INFLAMMATION!!!** Biotoxins from *Borrelia*, *Bartonella*, *Babesia*, mold, yeast, etc... can escalate cytokine production which is the body's inflammatory immune response causing severe symptoms and significant hormone imbalance. This illness from biotoxins must be treated along with any infections in order to restore health.

Due to the complex overlay of symptoms, we may need to identify layers at a time.

Lyme Disease (*Borrelia*)

Tick Borne Co-infections -

(*Bartonella*, *Babesia*, Ehrlichiosis)

Mycoplasma and Chlamydia Pneumoniae

Candidiasis and Intestinal Yeast Overgrowth

Heavy Metal Toxicities

Mold and Mycotoxins

Food Allergies (IgM and IgG)

Chronic Viruses

Parasites

Biofilm



- Bb can co-exist in common biofilms with multiple other pathogens
- The biofilm enables Bb to survive despite being in a stressful environment created by the immune system and antibiotics.
- One unique feature of Borrelia biofilm is the externalization of its DNA, which is incorporated into the matrix made by extracellular polymeric substances (EPS), giving the spirochetes a protective coat inside the host.
- Resistance and recurrence are influenced by the formation of different morphological forms of Bb which can exist together in a matrix of different cell forms (cysts, spiral forms, granular, L-forms) – all forms are capable of existing in biofilm.
- *Proteomyxzoa rheumatica* (2012)- prodigious biofilm producer

Incidence and prevalence

- ▶ 30 K in the past
- ▶ Greater than 300 000 new cases
- ▶ Rash
- ▶ Sensitivity of testing
- ▶ History most important
- ▶ Stats in Florida

Testing

- ▶ “Mayo clinic workup”
- ▶ Labs for Biotoxins
- ▶ Igenex, Specific Bands for Lyme
- ▶ Difficulty in documenting for Bartonella and Babesia
- ▶ C4A , Dr Shoemaker, Marcons and Staph
- ▶ Test for Mold
- ▶ CD 57, ADH
- ▶ HLA DBQR testing

Spirochetal Cousins Cause Lyme Disease & Syphilis



Borrelia burgdorferi (Bb)

- Chromosome + 21 plasmids
- 132 lipoprotein genes
- More genetic material
- 90% genes unrelated to any other known bacteria
- Linear DNA



Treponema pallidum

- Only 22 lipoprotein genes
- Unlike Lyme, lives only in the human host, as it lacks the ability to thermally adapt

Syphilis is Lyme's "dumb cousin"



Mechanisms of Persistence

To fight, flee, or hide are the imperatives of long-term survival by an infectious microbe

- **Active Immune Suppression**
 - Complement Inhibition
 - Induction of anti-inflammatory cytokines
- **Immune Evasion /Induction of Immune Tolerance**
 - Phase and Antigenic Variation
 - Immune Complexes
- **Physical Seclusion**
 - Intracellular seclusion
 - Incursion into immune privileged sites

Over 70+ papers between 1966 and 2009 which demonstrate persistence of Bb sp. in animal and human models

Compendium available upon request

Treatment option

- ▶ Basic support
- ▶ Mind Body-I can heal!! Renewed hope
- ▶ Diet
- ▶ Address Hormones
- ▶ Address GI health
- ▶ ZYTO evaluation
- ▶ Then address the Biotoxins

Alternate Morphologic Forms

- ▶ 1. Spirochete form- has a cell wall
 - ▶ Penicillin, Cephaloporphins, Primaxin, vancomycin
- ▶ 2. L-form (spiroplast) -no cell wall
 - ▶ Tetracyclines, Erthyromycin
- ▶ 3. Cyst

Antibiotic

- ▶ Single Agents
- ▶ Doxycycline/Minocycline
- ▶ Omnicef/Azithromycin
- ▶ Later Flagyl/Tindamax,
- ▶ Pulse therapy Bactrim, Rifampin or Minocycline/Tindamax alternate day
- ▶ Dr Horowitz approach
- ▶ Dr Jemsek/ Dr Jones
- ▶ Risk of meds, Cdiff and herxing

Herbals

- ▶ Saventaro, Samento or Cats claw
- ▶ Byron white
- ▶ Monolaurin
- ▶ Banderol
- ▶ Teasel
- ▶ Ayurvedic
- ▶ Stephen Buhner
- ▶ Essential oils/ Dr Ivanova

Additional support

- ▶ For low ADH
- ▶ Lymphatic drainage
- ▶ Lymphomyosot/Viscumforce
- ▶ Parsley, burbur or cilantro
- ▶ Antiparasitics/ Dr Klinghardt approach
- ▶ Antifungals
- ▶ Antivirals
- ▶ Binding Agents: charcoal, chlorella etc

Experience with Intravenous Therapy

- ▶ Support Iv's
- ▶ Fluids
- ▶ Ozone-autohemotherapy, why does it work
- ▶ IV rocephin, how often and how long
- ▶ HIGH dose Vitamin C for 10 days
- ▶ Risk of Iv's,
- ▶ Benefits
- ▶ Future-IV Argentym 23 protocol

Case discussion

- ▶ Mystery Diagnosis
- ▶ CFS
- ▶ Rheumatic Fever for 7 years and anemia
- ▶ Entire family
- ▶ Patients personal experience

Bacterial Persisters

- Persisters are a small fraction of quiescent bacterial cells that survive lethal antibiotics but can regrow leading to post-treatment relapse. Ex's: **TB, syphilis, endocarditis, brucellosis, biofilm infections**
- Recent studies have identified a number of genes and pathways that shed light on the mechanisms of persister formation or survival. These include **toxin–antitoxin molecules, DNA repair or protection, phosphate metabolism, anti-oxidative defense and macromolecule degradation.**
- **Persisters, persistent infections and the Yin–Yang model, Ying Zhang; Emerging Microbes and Infections (2014) 3, e3; doi:10.1038/emi.2014.3**

This is Not Just an Infection

- ▶ Immune imbalance and dysregulation
- ▶ Neurological impairment
- ▶ Communication dysregulation
- ▶ Endocrine malfunction
- ▶ Gastrointestinal damage and dysbiosis
- ▶ Toxin mediated impairment
- ▶ End- organ damage
- ▶ Neuropsychological impact

Rebuilding Damaged tissues

- ▶ Probiotics/ fermented foods
- ▶ Antifungals
- ▶ Collagen vs bone broth
- ▶ Vitamin K2
- ▶ Omegageneics
- ▶ GI support
- ▶ Stem cells

Other thoughts

- ▶ Turpentine
- ▶ LDN
- ▶ Wholebody hyperthermia
- ▶ Salt protocol

Take Home

- ▶ Keep up hope
- ▶ Longer the symptoms the longer the recovery
- ▶ Multi prong support protocol
- ▶ Adequate killing of pathogens with appropriate clearing
- ▶ Experienced Team

Thank You

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