Germs in Mental Illness

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What might I already know?

Do you have connections to someone diagnosed with:

- Lyme Disease, other Tick Borne Illness, PANDAS
- Fibromyalgia or similar symptom cluster (SAD, CFS)
- Atypical MS, ALS, Parkinson's, Irritable bowel
- Autistic Spectrum Disorder?

~Write out your questions on chronic illness~

Historical Perception of Mental Illness

- You're possessed by demons & need punishment…
- Your mother caused it & you need psychoanalysis
- Your serotonin is low & you need Prozac
- Your genes are bad, you can't change them
- Scientologists & insurance companies say psychiatry & pharmacology are demons & need punishment…
- **Your immune system & chronic infections contribute & you need antibiotics and related treatments**

NIH Human Microbiome Project

- A study researching all of the various microbes that live in people. The project has already established that the bacteria in the human microbiome collectively possess at least 100 times as many genes as the 20,000 or so in the human genome. **Bacterial cells outnumber human cells by 10 to 1.** What does this mean? We have more foreign DNA than intrinsic. It is very important to know your foreign 'DNA landscape' to effectively treat illness and rebalance the body.

- Humans depend on their microbiome for essential functions, including digestion- leading microbiologists to conclude that a person should really be considered a super-organism.

New York Times - May 23, 2008

What Provokes the Immune System?
What provokes the microbes to 'act out'?

- Infections
- Cancer
- Allergens
- Stress
- Sleep deprivation
- Vaccinations
- Trauma
- Stealth Microbes
- Toxins/Heavy Metals
- Degenerative changes
  - Barometric pressure drops

"The Decade of the Microbe"

- 10th Psycho-immunology Expert's Symposium

World Psychiatric Association, Psycho-immunology Mtg

ILADS (International Lyme & Associated Diseases Society) announces a global health initiative

Topic: *Neuro-psycho-immunology of Severe Psychiatric Disorders. Interacting cell systems and infectious agents in immune response*

- **Previously unexplained diseases, syndromes and symptoms can now be linked to chronic, persistent infections.**

Microbes Misdiagnosed

Bacterial infections are associated with many auto-immune diseases involving chronic inflammation and de-myelination. The possible mechanisms of bacterial involvement as etiological agents or in the exacerbation of these diseases have been investigated and recently demonstrated intensively.

Gajanan Sherbet. BJMP 2009:2(1) 6-13

Scientific evidence that supports the link (between Microbes and Mental Illness)

- Several thousand peer reviewed reference articles demonstrate the association between infections and mental symptoms (www.ilads.org).
- At least 65 different microbes have been recognized as **causing** mental symptoms.
- Over two hundred peer reviewed articles describe the causal association between Lyme/tick-borne diseases and mental symptoms (along with pathophysiology and morbidity)[1]

[1]Preventable cases of autism: relationship between chronic infectious *diseases and neurological outcome. Pediatric Health (2009) April 3(2).*

CDC article substantiates link

- Non-communicable chronic diseases can stem from infectious agents.

Identifying the relationships can affect health across populations, creating opportunities to reduce the impact of chronic disease by preventing or treating infection.

- **Infectious agents likely determine more cancers, immune-mediated syndromes, neuro-developmental disorders, rheumatic and other chronic conditions than currently appreciated.**

- To capitalize on these opportunities, clinicians, public health practitioners, and policymakers must recognize that many chronic diseases indeed have infectious origins.

Siobh M. et al (CDC). Emerging Infectious Determinants of Chronic Diseases. Emerging Infectious Diseases. Vol. 12, No. 7

Some microbes associated with mental symptoms & mental illness

Spirochetes•Borrelia afzelii(Lyme disease in the UK and the rest of Europe)•Borrelia burgdorferi sensu stricto(Lyme disease in the USA, UK and rest of Europe)•Borrelia garinii(Lyme disease in the UK and rest of Europe)•Borrelia hermsii(relapsing fever)•Borrelia turicatae(relapsing fever)•Leptospira(Leptospirosis)•Treponema pallidum pallidum(syphilis)Bacteria•Anaplasmas phagocytophilum(human granulocytic ehrlichiosis)•Bartonella henselae(cat scratch fever)•Bartonella quintana(trench fever)•Bartonella rochalimae(bartonellosis)•Chlamydophilia pneumoniae(chlamydia)•Chlamydophila psittaci(chlamydia)•Coxiella burnetti(Q-fever and post-Q fever fatigue syndrome)•Ehrlichia chaffeensis(human monocytic ehrlichiosis)•Francisella tularensis(rabit fever or tularemia)•Haemophilus influenzae(haemophilus)•Listeria•Meningococcus(meningococcal meningitis)•Mycoplasma fermentans•Mycoplasma pneumoniae•Mycobacterium tuberculosis(tuberculosis)•Rickettsia akari(rickettsialpox)•Rickettsia rickettsii(rocky mountain spotted fever)•Rickettsiaspecies (eastern tick-borne rickettsiosis)•Shigella(shigellosis)•Streptococcus pneumoniaeor pneumococcus (pneumonia)•Streptococcus(pediatric autoimmune diseases associated with Streptococcus, Sydenham's chorea and St Vitus dance)Yeast•Candida albicans(candidiasis)•Candida dubliniensisPrion•Variant Creutzfeldt–JakobViruses•Borna virus•Coltivirus(Colorado tick fever)•Coxsackievirus•Cytomegalovirus•Enterovirus•Flaviviridaevirus (Japanese B encephalitis)•Hepatitis C virus•Herpes virus family•Human endogenous retroviruses•Human herpesvirus 4or Epstein–Barr virus•HIV•Influenza A virus subtype H3N2 (Hong Kong flu)•Influenza virus•Pandemic influenza of 1918•Papopavirus•Paramyxovirus(measles virus)•Parvo B19•Poliovirus•Rabies virus•Rubella•Toga virus•Varicella zoster virus (chicken pox)•Viral meningitis•West Nile virusProtozoa•Plasmodium(malaria)•Babesia microti(babesiosis)•Babesia duncani(babesiosis)•Other Babesiaspecies (babesiosis)•Toxoplasma gondii(toxoplasmosis)Parasites•Blastocystis(blastocystosis)•Taenia solium(neurocysticercosis or cysticercosis)Fungal•Cryptococcoccus•Coccidiomycosis•Histomycosis

-Bransfield. Pediatric Health, 2010

P.A.N.D.A.S.

(Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococci)

- PANDAS patient is frequently highly intelligent, very communicative child who is also a very good student.

- **Characteristic presentation. Sudden onset** of symptoms (for those >5 years old). **Wax-and-wane pattern** of symptoms. Symptom exacerbation is frequently associated with or may occur following an infectious event and/or live virus vaccine administration. Even without the treatment there may be partial improvement in symptoms within 3 - 6 weeks. Unfortunately, certain symptoms (especially the separation anxiety) will persist.

- **Significant elevation of GABS antibody titers (i.e., ASO titer, AntiDNase B titer)** is common, but not necessarily present in every case. Negative GABS titers do not absolutely *exclude* the diagnosis of PANDAS. Measurable clinical improvement following the "Steroid Burst".

PANDAS Symptoms

- Tics (motor, vocal, complex)
- Separation anxiety
- Anorexia
- Obsessive Compulsive Symptoms
- Sleep disorders (insomnia, night terrors, refusal to sleep alone in the room) Other behavioral regression ("baby-talk", temper tantrums)
- Hyperactivity, inattentiveness, inability to concentrate
- Aggressiveness
- Significant deterioration in learning abilities (particularly in mathematics)
- Hallucinations
- "Puppet-like" spoken and body language; "hyper-alert" look or demeanor; Presence of wide pupils particularly during the acute stages of disease
- Urinary frequency and/or bed wetting and/or daytime accidents
- Demonstrable short-memory loss
- Fine motor skills deterioration
- Increased sensory responses (to smell, sound, light, touch)

Tick Borne Illness quiz (True/False)

1. Lyme disease is seen across America.
2. I can get a test for Lyme Disease that will tell me if I am infected.
3. There is a known cure for Lyme Disease.
4. Lyme patients tend to feel worse when they begin treatment.
5. Infectious Disease doctors are the best doctors to treat Lyme Disease.
6. Lyme patients suffer from metal toxicity.
7. Lyme patients often have illnesses other than Lyme.
8. I can catch Lyme from a tick only.
9. Lyme can be passed from mother to child.
10. “Wait and see” is a good idea after being bitten by a tick.

Tick Borne Illness Questionnaire (cont)

11. Prophylaxis is a good plan after being bitten.
12. I should continue treatment after I'm feeling better.
13. 28 days is enough antibiotic treatment.
14. If I don't have a rash, I don't have Lyme disease.
15. Facial palsy is a good sign that I have Lyme disease.
16. If my joints don't ache, I don't have Lyme disease.
17. Lyme Disease can cause psychiatric symptoms.
18. Many doctors do not believe chronic Lyme exists.
19. Lyme, autistic and ADD patients are similar.
20. Neuropsychiatric Lyme symptoms can be reversed.

Which are symptoms of Lyme/TBI?

- Seizures
- Psychosis
- Memory Lapses
- Anxiety/Panic attacks
- Chemical sensitivities
- Bipolar disorder
- Autistic Spectrum Disorder
- Obsessive Compulsive Disorder
- Violent behavior/Irritability
- Sleep disorders
  - *Lyme/tick-borne disease can cause ANY psychiatric syndrome in the DSM-IV*

Why these symptoms?

Future research may help us to further understand the role of **inflammation as a mediator** of the chronic persistent symptoms experienced.

Lyme disease, caused by the bacterium Borrelia burgdorferi, can cause multi-systemic signs and symptoms, including **peripheral and central nervous system disease**.

What is a STEALTH microbe?
What is Bb? What is SS?

LD? TBI?

Borrelia Burgdorferi, the causative bacteria in Lyme Disease, is capable of transforming into three distinct bacterial forms: spirochete, cell-wall-deficient, and cyst. This transformation occurs for the purpose of bacterial survival and proliferation in the human body.

http://www.lymebook.com/top10forms

Syndromes & Infections

- The same syndrome may be caused by different infections in different individuals
- The same infection can cause different syndromes in different individuals

Research on genetic polymorphisms (mutations) helps us to better understand this (Amy Yasko, MD)

www.knowyourgenetics.com

Why? The (germ) variables involved..

- Corkscrew burrowing of Spirochete
- Blood Brain Barrier (Penetration through cranial nerves)
- Infected immune cells penetrate CNS
- Neurotoxins and cytokines
- Partial barrier to treatment (timing, etc.)
- Infections in the body can cause different levels of inflammation in different parts of the body

WHY SO SICK?
The proposed variables

Degree of illness depends upon many variables

- Where one got infected on his/her body
- Which types of infections (co-infections), which species of infection, how much transmitted
- Status of immune system prior to infection (over or under active)
- Congenital factors (DNA) and polymorphisms
- Environmental factors and stressors
- Areas of weakness in body due to past trauma
- Delay due to unaware community (doctors, patients)

The Mysteries Behind Psychiatric Misdiagnosis
The SPIROCHETE Example

- Activation of the inflammatory response correlates with neuropsychiatric and neurological symptoms of fatigue, aggression, depression, anxiety
- Treating syphilis or tick-borne (spirochetal) disease patients with antibiotics may cause a Jarisch-Herxheimer reaction
- **This "herx" reaction may exacerbate any symptom**
- A sudden appearance of depression, suicide attempts, agitation & violence may be a part of this reaction
  - Slowly starting the antibiotic, close observation & psychotropic medication might be helpful

What can inflammation do to the brain?

The pathophysiology of major depression, schizophrenia, bipolar disorder and autistic spectrum disorder is associated with the **hyperactivity of immune inflammatory responses**.

Interestingly, Cyclooxygenase-2 inhibitors and many psychotropics (for example, celecoxib and fluoxetine/Prozac and Celebrex) reduce the production of pro-inflammatory cytokines (they have antimicrobial properties).

Summary: Inflamed Sickness Syndrome

Mediated by Proinflammatory Cytokines (IL-1, IL-6, and TNF)

- Fatigue
- Anhedonia
- Anorexia
- Increased pain sensitivity
  - Sleep disturbances
  - Decreased sexual interest
  - Social withdrawal
  - Cognitive difficulties/deficits

Progression of Mental Disease Over Time

Mental disorders can begin with *sleep disorders, then progress to anxiety disorders, depression, possible psychosis, and then dementia.*

This disease progression is associated with increasing levels of inflammation.

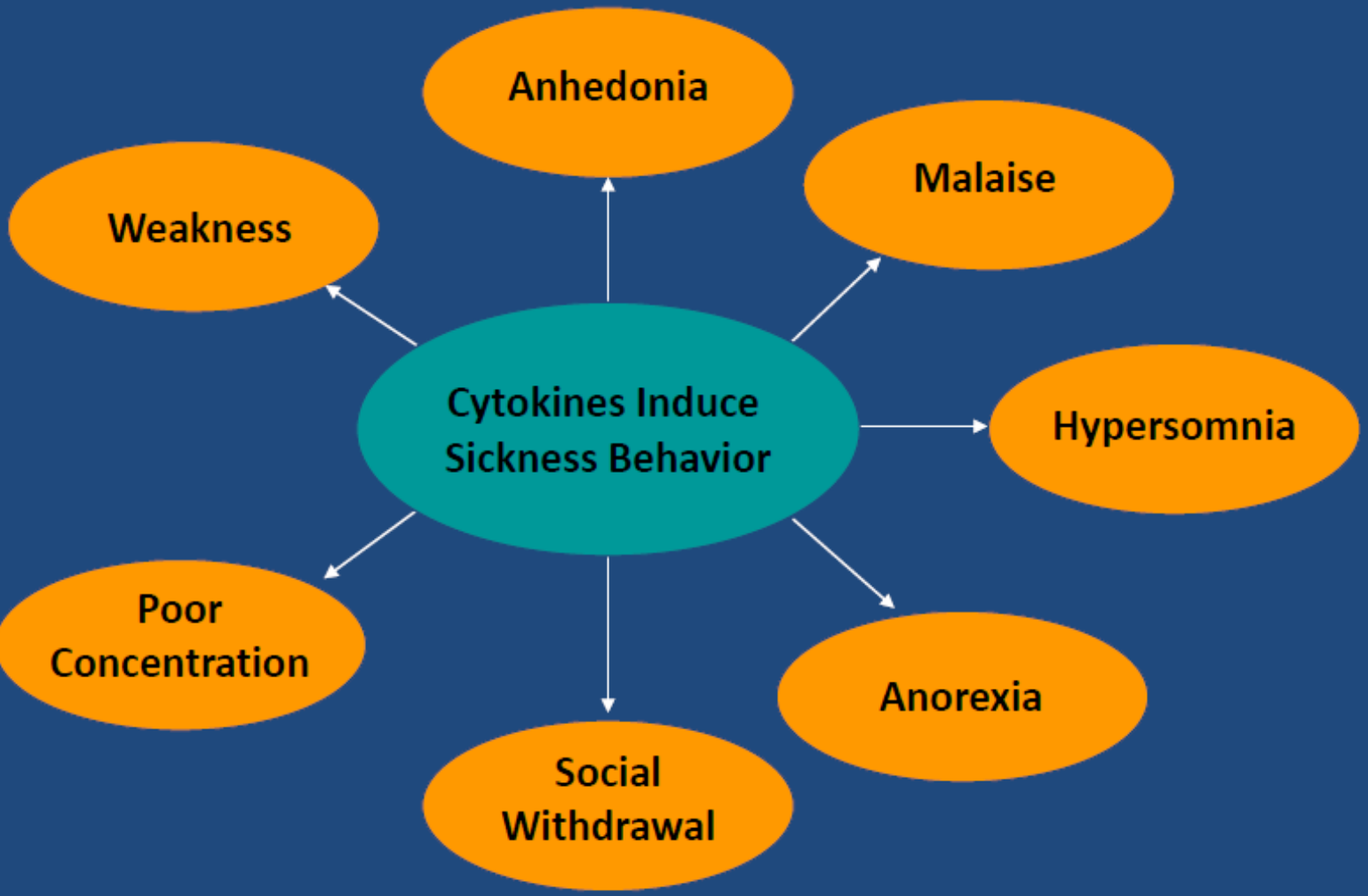
In the news, we have heard terms such as 'lyme brain' and 'lyme rage' which describes cases of significant infection and inflammation.

Progressive Infection & Inflammation is Associated with Increasing Encephalopathy & Increasing Mental Symptoms

Mild	Moderate	Severe
Executive dysfunction	Increasing cognitive deficits	Dementia
Reduced frustration tolerance, irritability, dysthymia	Anxiety disorders, depression, impulsivity, personality disorders	Major psychiatric disorders, psychosis, suicide, homicide

Increasing Neurological, Multisystemic Symptoms & Fatigue

Effects of Immune Activation Resemble Depressive Symptoms



Musselman DL, et al. N Engl J Med 2001;344:961-966.

Inflammation and Depression

A Meta-Analysis of Cytokines in Major Depression

This meta-analysis reports significantly higher concentrations of the pro-inflammatory cytokines TNF-α and IL-6 in depressed subjects compared with control subjects. Depression is accompanied by activation of the inflammatory response system. In an inflammatory state, our brain decreases serotonin

Dowlat Y et al. Biological Psychiatry, 2008

Inflammation and Dementia

Inflammatory Proteins in Plasma and the Risk of Dementia: The Rotterdam Study

Plasma levels of inflammatory proteins are increased before clinical onset of dementia, Alzheimer disease, and vascular dementia.

Chronic Infections & Autism Spectrum Disorders

Immune reactivity in the mother, fetus and child appears to adversely effect developing neural tissue and contribute to the pathophysiology associated with autism spectrum disorders. This reactivity can be evoked by causes including both acute and persistent infections such as *Anaplasma, Babesia, Bartonella, Borrelia burgdorferi, Chlamydia pneumoniae, Ehrlichia, Human heprevirus-6,Mycoplasma (in particular Mycoplasma fermentans) and XMRV. Possible pathophysiological mechanisms include both inflammatory processes as well as autoantibodies to developing neural tissue.*

Bransfield RC. Pediatric Health

Impaired Sleep Correlates with Impaired Immune Functioning

- *Sleep and the immune system. Int J Immunopharmacol 1995;17:649-54.*
- *Disordered sleep in fibromyalgia and related myofascial facial pain conditions. Dent Clin North Am 2001;45:701-13.*
- *Management of sleep disorders in fibromyalgia. Rheum Dis Clin North Am. 2002;28:353-65.*
- *Sleep, neuroimmune and neuroendocrine functions in fibromyalgia and chronic fatigue syndrome. Adv Neuroimmunol 1995;5:39-56.*
- *Fibromyalgia, sleep disorder and chronic fatigue syndrome. Ciba Found Symp 1993;173:262-79.*

Sleep disorders are commonly associated with chronic inflammatory diseases and chronic age-or stress-related disorders. The best studied are rheumatoid arthritis, fibromyalgia and chronic fatigue syndromes.

Lorton D et al. Neuroimmunomodulation. 2006;13(5-6):357-74. Epub 2007 Aug 6.

Children

Depressive, Panic, and Aggressive Disorders

Rarely are children initially diagnosed with psychiatric manifestations of LD or TBIs, because their complaints are vague and thought to be functional in nature (related to the external environment).

People remain unaware of how psychiatric manifestations that lower the child's frustration tolerance and/or increase irritability and impair cognitive functioning, are often due to inflammation and infection.

Summary Comments

Cognitive and behavioral difficulties in Lyme and TBI's are similar to those observed in affective, oppositional defiant, and attention deficit disorders. *Tager et al., 2001*

Infection can exacerbate pre-existing behavioral or psychiatric illness. *Bransfield, 2007*

60% of confirmed LD adult patients reported an episode of major depression during their illness (Rachman & Garfield, 1998).

Moreover, significant numbers of hospitalized psychiatric patients were found seropositive for *B. burgdorferi relative to healthy comparison subjects (Hajek et al., 2002).*

Integrating Neuro-psycho-immunology with Psychiatry

Since interaction between the immune and nervous systems can cause mental illness, greater interaction is needed between immunologists and practicing psychiatrists to more effectively treat mental illness.

The average person needs to be educated on these connections so as to help themselves or others to get the best treatment.

Integrative Practitioners

LLMD's, ND's, DO's, PA-C's, etc. should:

- Rule out stealth illness and multisystem involvement.
- Be involved with ILADS (International Lyme and Associated Disease Society)
- Test for heavy metals, co-infections, opportunistic infections, viruses, iodine levels, complement levels, immune markers.
- Pursue a variety of testing and treatment for Lyme and TBI
  - CD-57, C-6 Peptide, blood smears, use IgeneX
- Should help to educate their patients

www.lymediseaseassociation.org, www.ilads.org
www.lymepolicywonk.com

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For sharing his slides

Lyme Disease, Psychiatric Symptoms and Aggressiveness (2009)

Applying Psycho-immunology to the practice of Psychiatry (2010)