Dementia caused by Borrelia infection of the Central Nervous System

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Walking on Thin Ice

DLB
Diffuse Lewy Body Disease
Cystic Borrelia Form

Cystic Borrelia in Alzheimer Autopsy Brain 1987

Plaques Alzheimer Disease

Concurrent Neocortical Borreliosis and Alzheimer's Disease 1988
Hypotheses about Dementia

- Noguchi […hypothesis testing] --1913
- MacDonald[..hypothesis....] -------1985
- Miklossy[hypothesis ...] ----------1992

Spirochetal
Brain “Fog” as a Metaphor

Clouded Mentation

Apraxia of Thought

Senility

“Old Timer”

Apraxia...

Loss of ability to carry out purposeful movements, in the absence of paralysis, .. Especially inability to make proper use of an object...
Perseveration

• “Broken Record” Type – Perseveration in Dementias
  Repetitions without Cognizance

• Scientific Perseverations as a Motif
  Rigid and unweilding
  “Herr Professor Types”
Problem of the Perfect spirochetes

Perfect spirochetes as a Perseveration “motif”
Anecdotes in Medicine

Un - Scientific

Un - Informative

Un - trustworthy
Where is it Written ??

Did you “Get it Past an Editor”?
Inside of the Nerve
Infections by Borrelia

Cystic Borrelia
(Rationale for Chronic Disease)

Evidence for Neural Invasion

Trans-synaptic transmission of Infection

Neural Circuit Infections –
Progressions in Nerve Disease
Time Capsules

*****

1. **Dementia** - What makes it Alzheimer’s
2. **Plaques** - of Alzheimer’s
3. **Tangles** - of Alzheimer’s
4. **GVB** - of Alzheimer’s
5. **DNA in the GVB’s**
6. **DNA in Plaques**
7. SSPE model – *Tangles from Viral Infection*
8. Borrelia to Tangles – *Pathway inside the Neuron*
9. Trans-Synaptic transmission of Infections
10. Trans-Synaptic Neuroborreliosis
11. Braak Stages- *of Alzheimer’s Disease*
12. Redefined Braak Stages -
13. Dr Miklossy – *Landmark observations in Alzheimer’s*
14. Dr Noguchi – *Landmark observations in General Paresis*
15. **Negative Reviews** – Borrelia and Alzheimer’s

16. **Rebuttals** - from Miklossy and MacDonald
Antibodies – Are they Necessary???
.....Evidence for New Discoveries?
{IDSA version of Truth ??}

Pre spirochetal times

Knowledge Acquired before the Etiologic Agent was in the Textbook

Post spirochetal times
Pre-Spirochetal Era
1492
Protean Disease Manifestations by Observation without Laboratory testing

Spirochetal Era
1905
1913
Dementia General Paresis Spirochetes in Autopsy Brain
Borrelia and Dementia – Previous Lecture
Topics from Miklossy 2004 LDA Lecture
And MacDonald 2005 Ilads Lecture

Cultures Alzheimer Brain tissue -------POSITIVE

Alzheimer Brain tissue – ---------------Positive for Borrelia

Spinal Fluid ------------- Positive for Borrelia Antibodies

DNA Hybridization – Positive signals in Specific Brain regions
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Dementia – What makes it Alzheimer’s

Under the microscope: **The Big Three**

Many **Plaques** --- (Silver +, Amyloid, Tau protein +)

Many **Tangles** --- (Silver +, ______, Tau protein +)

**GVB** Granules ---- (Silver +, ______, _______)

Granules vary in size --- little to big
An Anecdotal Case Report – Just one !!
Dementia – What makes it Alzheimer’s

Neurofibrillary tangle

Normal pyramidal neuron
Über eine eigenartige Erkrankung der Hirnrinde A. Alzheimer (1907)

Allg. Zeitschrift Psychiatr. 64: 146-148
Dementia – What makes it Alzheimer’s

Synapses Are Lost
Nerve Structure Lost
Chemistry Corrupted
Sparkle - Dimmed

Sequence of dendritic tree changes in senile dementia (from Scheibel and Scheibel 1977).
Plaques
First Requirement for Alzheimer’s

Unstained Plaques are Overlooked
“Amyloid Free”
Plaques of the
Cotton Wool type

Density Of
Plaques
And
Loss of
Brain Weight
Plaques

“Caused By Amyloid” ???

Or

Signatures of a Microbial Pathogen??
A Tale of Two Plaques

Alzheimer’s Disease - Plaques
Dr Judith Miklossy

Plaques in Tertiary Neurosyphilis
General Paresis Brain at Autopsy 1929

Fig. 4. Illustration of the striking similarity of the agglomeration of spirochetes in the cerebral cortex in case AD1 with positive Lyme serology and in general paresis. Compare the similarity of the silver
Tangles
Second Requirement

Unstained Plaque at 3 o’clock position

Silver Stained Plaque at 9 o’clock position

Silver Stained Tangles
And Silver stained Tangles
Dr Kidd

Discovers that

Tangles are Not “corpses” of

Previous Microtubules
GVB are “Dots” inside of “Bubbles” Which are Inside of Diseased Nerve cells

Hypothesis: GVB in Alzheimer’s Are the “signature” of Granular Spirochetes inside Nerve cells
In Situ DNA and Rat Tissue culture

Miklossy
Rat nerve cell
H5332 monoclonal +

Granules vary in size – from little to big

MacDonald
human Alzheimer In situ DNA

In Situ DNA hybridization
Alexa Fluor (red) Fluorochrome

Alzheimer
Hippocampus
1000x Oil immersion

Oligonucleotides
BBÖ 147 (Fla B)
B. burgdorferi
In Situ DNA hybridization
Alexa Fluor (red) Fluorochrome

Alzheimer
Hippocampus
1000x Oil immersion
Oligonucleotides
BBO 147 (Fla B)
B. burgdorferi
Human Alzheimer
In situ DNA hybridization for Borrelia burgdorferi DNA

Granules vary in size – from little to big
Only Borrelia DNA Glows Green in the Picture

*Borrelia burgdorferi* Flagellin DNA, In situ hybridization, Large Plaque
1000x original magnification
Only Borrelia DNA Glows Green

In the picture

*Borrelia burgdorferi* flagellin DNA in situ DNA hybridization, Alzheimer hippocampus
1000x magnification.
MacDonald 1987
Cyst form H9724 +
Alzheimer Brain

Monoclonal Antibody for
The Flagellin protein of Borrelia
Developed by Dr Alan Barbour
Perfect Model for Tangles
Based on Inside of the Nerve Infection
In Children

The distribution of Alzheimer's neurofibrillary tangles and gliosis in chronic subacute sclerosing panencephalitis

Journal: Acta Neuropathologica
Publisher: Springer Berlin / Heidelberg
ISSN: 0001-6322 (Print) 1432-0533 (Online)
Subject: Medicine
Issue: Volume 80, Number 3 / July, 1990
SSPE Model
Tangles from Infection

Golden particles are Viruses Inside Nerve

Infectious Agent Crosses The Synapse
Borrelia to Tangles

Infectious Agent Inside of the Nerve cell

Inside of the cell Infection

Borrelia spirochetes inside
Hippocampal neurons in Alzheimer’s disease
Borrelia to Tangles

Infected Neuron

Infection Crosses The Synapse
Micro tubule Formation inside the Nerve

Normal tau function – axonal cytoskeleton

Tau protein (Healthy Type)
Stabilizes the Microtubule Cylindrical shape
Tau support and the Model of the Barrel
Tau and Rings of the Barrel

Healthy Tau Functions to Support

Spout is Synapse equivalent
Healthy Nerve Needs Healthy Tau Protein to Stabilize the Microtubules

Many Healthy Tau structural supporting proteins—
A Ring of supports around The tubule
Borrelia to Tangles

Loss of Tau = Loss of Tubules
Borrelia inside the Nerve – and pathway to Tangle Formations

1. Infection inside of the Neuron

2. Biochemical Derangements

3. “Toxic” Products – (Phos) added to Tau

4. Loss of “healthy” Tau Supports

5. Tangles (Unhealthy Tau proteins)---------

--Replace Microtubules -----Death of cell
Infections
Crossing Synapses

Herpes Zoster
“Shingles”

Dormant Virus from Childhood Chicken Pox
Stays hidden inside of Nerves for 50-80 years and Reactivates to “March “ down Nerve pathways
Infections
Crossing Synapses

Other Trans-synaptic Infections

Rabies

Lethal March of Virus inside Nerve Networks
Pseudo Rabies Virus

Infections Crossing Synapses

Non lethal Virus

Used to “Map” Neural Networks
Trans-Synaptic Neuroborreliosis

Alzheimer’s neuroborreliosis with \textit{trans}-synaptic spread of infection and neurofibrillary tangles derived from intraneuronal spirochetes

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Alzheimer’s Disease – A Neuron with a Round “Green thing”

Describe what you see, Please

Nucleus of Neuron – Yellow and round

Double Strand DNA stains Yellow

Diseased Nerve cell

Hint: Round Thing Containing DNA

Single Strand DNA stains Green
Single Strand DNA in Cytoplasm is Never seen in Healthy Neuron

![Cell image with green strands indicating spirochetal DNA inside the cell]
Braak Stages of Alzheimer’s

Normal Brain Size On Left

Alzheimer’s Disease Brain size On Right

Ellison & Love: Neuropathology 2e © 2004 Elsevier Ltd.
Braak Stages of Alzheimer’s
Braak Stages of Alzheimer’s
Braak Stages of Alzheimer’s Redefined as Infection in Neural Networks
Escalator Model for Ascending Braak Stages
Escalator Schema for Infection movements through neural Circuits
Dr Noguchi
Noguchi 1913
Treponema pallidum in General Paresis autopsy brain
Negative Reviews
Borrelia/Alzheimer’s

Marques et al – PCR Study using 16S target
Result***All Alzheimer’s brains Negative for PCR product

Miklossy Rebuttal – PCR Alzheimer 16 S PCR –
Positive Results in Alzheimer brains – Plus DNA Sequence Positive Evidence

Bergstrom Rebuttal – 16 S Nucleotides of Borrelia
Differ among Strains of Borrelia Spirochetes – Wrong Strain Primers Yield Negative PCR when Borrelia are still present
Negative Reviews-Borrelia/Alzheimer’s

Pappolla and Burgdorfer –

Pathology study of Alzheimer’s Brain tissues for-
Corkscrew Borrelia spirochetes.

Result ***No Borrelia corkscrew forms identified in Alzheimer
Brain tissues – *Fragmentary Forms in Tissue Declared Artefacts*

MacDonald Rebuttal -

1. No Positive Controls—No tissues known to show Borrelia Spirochetes in Brain tissue were utilized by Pappolla.

2. No “truncated” forms” - in plane of Section Allowed by Pappolla and Burgdorfer.
Negative Reviews-Borrelia/Alzheimer’s

Dr Dennis Dickson’s Letter of Protest
1987 Human Pathology

***** Dickson’s Allegations of “False Hope” for Alzheimer’s Patient’s.. based on a Single Case Study published by MacDonald and Miranda

“Concurrent Neocortical Borreliosis and Alzheimer’s Disease”

MacDonald Rebuttal – The Case of
Mr Paul Christensen
Mr Paul Christensen
Lyme disease in Spinal Fluid 8 years before Death from Alzheimer’s disease

All Spinal Fluid testing Positive for Lyme disease – SUNY School of Medicine Stony Brook

8 years prior to Death from Dementia

Autopsy Confirmed Alzheimer’s Disease –
SUNY School of Medicine, Stony Brook, New York
by Faculty Pathologist with Subspecialty Board Certification in Neuropathology-
Mr Paul Christensen
Alzheimer’s At Autopsy 8 years after Spinal Fluid + for Borrelia burgdorferi at Stony Brook

*Borrelia burgdorferi flagellin DNA in situ DNA hybridization, Alzheimer hippocampus 1000x magnification.*

*1000x original magnification.*
Mr Paul Christensen Alzheimer's at Autopsy
8 years after Spinal Fluid positive
for Borrelia burgdorferi Antibodies at SUNY Stony Brook
School of Medicine

Key points: Infection in Spinal Fluid – Lyme Positive

  Atypical Facial pain at presentation – later onset of Normal Pressure Hydrocephalus –

Shunt Placement – Shunt Infection – Antibiotics –
Clinical improvement – Antibiotics discontinued –
Dementia again develops – Deterioration to Death –
Alzheimer’s Disease at Autopsy

CERAD criteria satisfied at Medical School SUNY-
DNA Probes for Flagellin DNA – Positive hybridization signals in Alzheimer Plaques
Opportunities for Improvement in Alzheimer’s Patient Care

Contributions from the Molecular version of the Autopsy
Website

http://www.molecularalzheimer.org

Special Thanks to: Turn the Corner Foundation

New York City, New York

St Catherine of Siena Medical Center,
Smithtown, New York
Walking on Thin Ice

DLB
Diffuse Lewy Body Disease
Cystic Borrelia Form

Cystic Borrelia in Alzheimer Autopsy Brain 1987
Plaques Alzheimer Disease

Concurrent Neocortical Borreliosis and Alzheimer's Disease 1988
Ponder the Possibilities

Thank you
For
Your Kind
Attention
Alzheimer’s with GVB and ? Spirochetal form at 9 oclock

Granules vary in size – from little to big
Borrelia burgd. In transformation to granular forms

Granules vary in size – from little to big
Figure 1 | The corticotropin-releasing factor system in depression. Corticotropin-
spirochete from culture of Alzheimer brain extract in culture
DNA stain
400 s original magnification