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ALS, Alzheimer's, Parkinson's and Blue-Green Algae

Don Anderson
WaterCon 2012

The Tangle Diseases

- ALS and others sometimes called this
- Due to tangled growths in brain
- One more is PSP or progressive supranuclear palsy
- Blank stare, loss of eye control
- Other symptoms like P, A, and ALS

ALS

- Amyotrophic Lateral Sclerosis
- Muscle Wasting Disease
- Nerves that control muscles damaged
- Lou Gehrig's Disease, 1930s NY Yankee
- Stephen Hawking, English Physicist, ALS for 35 years
- 5600 Americans each year, 90% no cause

ALS Symptoms

- Awkward hand movements
- Stumbling and tripping when walking
- Wheel chair bound eventually
- Garbled speech; laughing, crying episodes
- Loss of swallowing and breathing muscles
- Tube inserted into stomach for food
- Mind still good

What Causes the Nerve Damage?

- Guam after WW II
- Army Doctors saw epidemic of lytico-bodig in native Chamorros
- Lytico = paralysis bodig = dementia
- Some had ALS symptoms
- Some had shaking of Parkinson's
- Some had mental foggiess of Alzheimer's

More about Guam

- After 10 years, Filipinos who adopted native customs had disease at high rates
- Natives grind cycad seeds into tortillas, chips
- Cycad is palm or fern like tree
- Seeds had BMAA, can kill nerve cells
- Monkeys fed high doses got symptoms
- Epidemic declined in 1990s

Guam Fruit Bats

- Why did the epidemic decline in 1990s?
- Chamorros eat fruit bats, bats eat seeds
- Entire bat eaten: brain, bones, skin, hair
- By late 1980s, bats almost extinct, shotguns
- Each bat BMAA equal ton of cycad flour
- Blue-green algae growing in cycad roots
- These algae produce BMAA

Brain Tissue Samples

- Six Chamorros – died from Iytico bodig
- Two Canadians – died from Alzheimer's
- 13 Canadians – died with no nerve damage
- All six of Chamorros had BMAA
- Two Canadians with Alzheimer's had BMAA
- 13 Canadians did not have BMAA

Blue-green Algae

- Not really algae are cyanobacteria
- Produce food by photosynthesis like algae
- Found everywhere in soil and water
- Form slimy green films on rivers/lakes
- Thrive in warm water and sewage runoff
- Fish and shellfish eat the films with BMAA
- Humans eat fish, drink water, swim in water

Cyanobacteria

- Like calling a dog a plant
- Produce toxins that damage nerves, liver and promote tumors
- Blooms poison wildlife, massive fish kills
- In humans: rashes, numbness, vomiting, liver or nerve damage

BMAA

- Most people metabolize and excrete it
- Some genetically susceptible deposit in brain
- In Florida, shellfish had moderate levels
- Florida shrimp, bass, crabs => Guam bats
- 23 of 24 brain samples for 12 Alz had it
- 2 of 24 brain samples for non Alz had it
- All brain samples for 13 ALS had it

Other BMAA Sources

- Milk
- Dietary supplements
- Spirulina shakes

Huntington's Disease

- Causes nerve damage
- Entirely genetic disease
- 16 samples for 8 persons only trace of BMAA

Other Test Results

- Mice fed high levels of BMAA did not collect it in the brain
- Alzheimer's Disease Research Center at UC did not find BMAA in brains of Chamorros and North Americans who died of brain disease

ALS and Alzheimer's Experts

- There is no single cause for these diseases
- There are multiple causes
- Genes, poor diet, lack of exercise, environmental agents
- Remember when aluminum was linked with alzheimer's – alum, pots and pans feared
- Aluminum presence was result not cause

New ALS Clusters

- SE Japan, Indonesia, Guadaloupe(Caribbean)
- American veterans of first Gulf War: inhaled desert crusts with cyanobacteria
- New England: persons living near lake or pond with blue-green algae blooms are 2.5 times more likely to develop ALS
- New Hampshire Lake had 10 to 25 times normal rate of ALS

Woman's Hair Samples

- A woman who died of ALS like illness had a habit of cutting her hair, dating and saving it
- Her hair showed BMAA in 1939
- BMAA levels gradually increased over 20 years
- By 1957, BMAA levels matched levels found previously in some Alzheimer's patients
- Levels peaked in 1962 and none were found near her death

Could Tap Water Cause ALS, A, P, PSP?

- Answers: a. no b. maybe c. maybe ALS
- Sand filtration, PAC, chlorine remove BMAA
- Flocculation not as effective
- Simple dipstick water test is possible
- Scientists kicking genetic ball for 15 years
- 90% of cases not genetic
- 20 Universities are focusing on BMAA

References

- The Tangle, Jonathan Weiner, New Yorker, April 11, 2005
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