Alzheimer Disease
An update with answers to common questions

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- Financial disclosures: none
- Discussed off label use of medications: yes

Dr. Alois Alzheimer 1906

- Plaques: beta-amyloid protein fragments
- Neurofibrillary Tangles: twisted strands of the intracellular protein tau
- Both can be detected in CSF

Projection of the number of cases of Alzheimer’s Disease in the United States by age group

- 5.4 million Americans have Alzheimer’s disease
- Doubled since 1980
- 18 million by 2050
- In 2013, total Medicare and Medicaid spending estimated $203 billion.
- The average per person Medicare payments for those with Alzheimer’s and other dementias are three times higher than for those without these conditions.

http://www.cdc.gov/mentalhealth/data_stats/alzheimers.htm

Structural Volumetric Changes
Is it Alzheimer’s or normal aging?

When to worry...

- Persistent daily symptoms noticeable by others
- No other obvious explanation
- Interference with social and occupational functioning
- Consider neuropsychological testing

Types of Dementia

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Alzheimer</td>
<td>STM loss, most common: 60% - 80% of all dementias</td>
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<tr>
<td>Lewy Body / Parkinson disease</td>
<td>Parkinsonism, 30% of dementias, behavior disorder, visual hallucinations</td>
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<tr>
<td>Frontotemporal</td>
<td>Behavioral changes, aphasia, relatively preserved STM</td>
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<tr>
<td>Vascular (stroke)</td>
<td>History of stroke, 6% - 10% of dementias, sudden onset</td>
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<tr>
<td>Alcoholic</td>
<td>History, cerebellar ataxia</td>
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<tr>
<td>Creutzfeldt Jakob (CJD)</td>
<td>Rapid, myoclonus, prion proteins deposit in brain</td>
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Visual Variant of Alzheimer Disease

- Also called posterior cortical atrophy
- Cerebral atrophy of occipitoparietal & occipitotemporal regions seen on neuroimaging
- Patients c/o “Seeing But Not Recognizing”
- Loss of contrast sensitivity and dyschromatopsia seen in later onset AD
- Abnormal VEP’s and abnormally high variability of saccadic accuracy (dysmetria) and speed (latency)
- VF defects most common inferiorly affecting reading, near work and ambulation
- Usually normal VA unless also has cataract or ARMD
Visual Variant of Alzheimer Disease

- Alexia: difficulty reading (seeing but not recognizing)
- Agraphia: trouble staying on the correct line of text
- Visual agnosia: trouble navigating the environment
- Simultagnosia: inability to perceive more than one visual target in a complex visual scene
- Ocular apraxia: when asked to look at an object, first stare straight ahead, then gaze around the room erratically until, as if by chance, their eyes fall on the object
- Optic ataxia: inability to reach for objects of interest due to defective visual control of hand movements

Visual Variant of Alzheimer Disease

- Prosopagnosia: inability to recognize faces
  - face blindness
  - affects fusiform gyrus
  - acquired – rare
  - congenital – 6-8% of U.S. population
- Oliver Sacks, MD
  - The Man Who Mistook His Wife for a Hat
  - Awakenings
  - The New Yorker, August 30, 2010

Work up
Not “just getting old”...

- History (patient and family)
- Physical / neurological exam
- Mental status examination
- MRI, CT, PET, fMRI
- CBC – 49% increased risk if anemic
- Electrolytes
- Thyroid
- B12 and Folate
- Other tests based on history

Common non-neurological causes of cognitive impairment
Mimics of Alzheimer’s

- Depression
- Hearing loss
- Medication side effects
- Bladder infection
- Sleep disorder

Mild Cognitive Impairment (MCI)

- Mild cognitive decline
- Impairment of either memory, language, executive function or visuospatial skills
- No impairment of social or occupational functioning
- Risk of AD: about 12% per year
Alzheimer Disease Progression

Normal Mild Cognitive Impairment Alzheimer Dementia

New Diagnostics

CSF: amyloid β42
PET: radiolabeled ligand for amyloid
PET: metabolic abnormality: glucose hypometabolism
MRI: structural volumetric change: Hippocampal atrophy

New Diagnostics

• Retinal Amyloid Index (NeuroVision) – detects amyloid plaques in the retina
• Sapphire II (Cognoptix) – detects amyloid plaques in crystalline lens
• PET scan - $5000 and radioactive
• More likely to develop therapeutic solution if we can identify AD earlier?
• Will eye doctors be front-line for AD?

Management

• Clarify diagnosis, educate patient’s family
• Identify and treat contributing conditions
• Treat symptoms
• Begin planning for progression
• Assess safety including driving, medications, use of appliances, financial
• Connect with community resources
• Team approach: family, community, primary care provider, psychiatrist, family memory care consultant, social workers, pharmacist

Medication Treatment

**No medication slows the disease process***

• ACH-esterase inhibitors
  • Donepezil (Aricept)
  • Galantamine (Razacyne)
  • Rivastigmine (Exelon)
• NMDA-receptor antagonist
  • Memantine (Namenda)

Alzheimer’s Myths

1. Memory loss is a natural part of aging
2. Alzheimer’s disease is not fatal
3. Only older people can get Alzheimer’s
4. Drinking out of aluminum cans or cooking in aluminum pots and pans can lead to Alzheimer’s disease
5. Aspartame causes memory loss
6. Flu shots increase risk of Alzheimer’s disease
7. Silver dental fillings increase risk of Alzheimer’s disease
8. There are treatments available to stop the progression of Alzheimer’s disease

From Alzheimer Association
Is Alzheimer’s Inherited?

- About 5% of cases
- Usually early onset
- In most cases, the disease probably arises due to many genes interacting with the individual patient’s environment
- Genetic testing not recommended for family members

Can Alzheimer’s be prevented?

Possibly...

- Vascular risk factors
- Cognitive activity
- Physical activity
- Social engagement
- Diet
- Depression
- Avoid smoking, alcohol, head injuries

Heart and Brain

- Vascular risk factors
  - High blood pressure
  - Diabetes
  - High cholesterol
  - Obesity (mid-life)

Cognitive Activity

- Higher educational attainment – 5 years protection, irrespective of sex and genetic risk
- High lifetime intellectual attainment (high education/occupation and high mid/late life cognitive activity) delays onset (8.7 years/male; 8.8 years/female) who have genetic risk
- Mid/late life cognitive activity: reading, playing games and music, crafts, group/social activities, computer activities
  
  JAMA Neurology, June 23, 2014, Online First.

Alzheimer Disease Research: the Search for New Treatments

- Cholesterol-lowering drugs called statins
- Anti-oxidants (vitamins) and folic acid
  - Vitamin E, 2,000 IU daily delays functional decline 19% per year in patients with AD
- Anti-inflammatory drugs
- Substances that prevent formation of beta-amyloid plaques
- Nerve growth factor to keep neurons healthy
- Intranasal insulin

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Family and Individual Care Consultation
Provided by Alzheimer Association

Care Consultations (both phone and in-person) will include:
- Assessment of your current needs
- Assistance with developing a plan
- Assistance with finding resources and services
- Problem-solving
- Providing education and support
- Providing ongoing support and follow-up

Resources
Alzheimer’s Association
- www.alz.org
American Academy of Neurology
- www.aan.com