DEMENTIA

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Geriatric Fellow
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• MCI
• Defining dementia
• Etiology
• Risk factors
• Assessment
• Management
• Resources
Case

A 69 year old female with no complaints presents to your office with her 2 daughters. Further history reveals that the patient was widowed 4 years ago, now lives alone and has experienced memory loss over the last 2 years. One daughter is responsible for paying the patient’s bills. She notices that her mother often wears the same clothes and bathes infrequently. Past medical history includes hypothyroidism and hypertension. Family history is significant for depression and memory problems in the patient’s mother prior to her death.

Physical exam reveals a thin, elderly female in no distress. She is alert but does not correctly state the year. She describes her mood as “happy” most of the time. The remainder of the exam is unremarkable. You suspect dementia.
Case

Which of the following is true regarding the diagnosis of dementia?

A) The diagnosis is rarely missed in the primary care setting

B) To diagnose dementia, impairment in executive function must be present

C) To diagnose dementia, impairment in memory must be present

D) Alzheimer Dementia is a diagnosis of exclusion

E) Neuroimaging is essential in the diagnosis of dementia
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Continuum

- Changes can occur as much as 25 years before noticeable signs of impairment
- Convert to AD at rates 5-15% per year vs 1-2% for cognitively normal older adults
- MCI can be missed on testing
- Mild, moderate, severe, profound, terminal
MCI

• Concern of patient and/or family regarding a change in cognition
• Impairment in one or more cognitive domains compared to what is expected for the patient’s age and education or meaningful change in functioning
• Relatively normal general cognitive function
• Preserved activities of daily living
The global impact of dementia

- Around the world, there will be 9.3 million new cases of dementia in 2015, one every 3 seconds.
- 46.8 million people worldwide are living with dementia in 2015. This number will almost double every 20 years.
- Much of the increase will take place in low and middle income countries (LMICs): in 2015, 58% of all people with dementia live in LMICs, rising to 63% in 2030 and 68% in 2050.

If global dementia care were a country, it would be the 18th largest economy in the world exceeding the market values of companies such as Apple and Google.

The total estimated worldwide cost of dementia in 2015 is US$ 818 billion. By 2018, dementia will become a trillion dollar disease, rising to US$ 2 trillion by 2030.

This map shows the estimated number of people living with dementia in each world region in 2015.

We must now involve more countries and regions in the global action on dementia.
What is Dementia

• Decline in intellectual ability
• Impacts memory plus one or more other cognitive abilities (judgment, planning)
• Aphasia, apraxia, agnosia, decline in executive functioning
• Severe enough to interfere with everyday functioning
• Progressive and disabling
- Mixed type
- Parkinson’s
- Mass effect
- Depression
- Metabolic disease
- Drug toxicity
- NPH
<table>
<thead>
<tr>
<th>Type</th>
<th>History</th>
<th>Signs, symptoms</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s Disease</td>
<td>Gradual, progressive onset</td>
<td>• Memory loss, especially for names and recent events</td>
<td>• Generalized atrophy (esp. medial temporal)</td>
</tr>
<tr>
<td>(50–80% of all dementia</td>
<td></td>
<td>• Language deficits</td>
<td>• Beta amyloid plaques</td>
</tr>
<tr>
<td>cases)</td>
<td></td>
<td>• Rapid forgetting</td>
<td>• Neurofibrillary tangles</td>
</tr>
<tr>
<td>Vascular</td>
<td>Abrupt or gradual onset</td>
<td>• Focal neurological signs</td>
<td>• Strokes</td>
</tr>
<tr>
<td>(20–30%)</td>
<td></td>
<td>• Signs of vascular disease</td>
<td>• Lacunar infarcts</td>
</tr>
<tr>
<td>Lewy Body</td>
<td>Insidious onset, progressive</td>
<td>• Fluctuating cognition</td>
<td>• White matter lesions</td>
</tr>
<tr>
<td>(10–25%)</td>
<td>with fluctuations</td>
<td>• Visual hallucinations</td>
<td>• Vulnerable to cerebrovascular events</td>
</tr>
<tr>
<td>Frontotemporal</td>
<td>Insidious onset, typically in</td>
<td>• Disinhibition</td>
<td>• Generalized atrophy</td>
</tr>
<tr>
<td>(10–15%)</td>
<td>50s–60s; rapid progression</td>
<td>• Socially inappropriate behavior</td>
<td>• Lewy bodies in cortex and midbrain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Poor judgment</td>
<td>• Frontal and temporal atrophy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apathy, decreased motivation</td>
<td>• Pick cells and pick bodies in cortex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Poor executive function</td>
<td></td>
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</tbody>
</table>
Epidemiology

• 6-8% of people ≥ 65 years have Alzheimer dementia (AD)
• About 45% of those ≥ 85 years have AD
• Prevalence doubles every 5 years
Etiology

- A healthy brain normally clears amyloid beta
- Clearance of amyloid beta is reduced in AD
- Accumulation of amyloid beta – plaques (extracellular)
- Accumulation of tau protein – neurofibrillary tangle (intracellular)
- Leads to nerve cell dysfunction and eventual cell death
- Lewy Body and Parkinson: cytoplasmic α-synuclein inclusion bodies
- Frontotemporal: tau or ubiquitin proteins
Case continued...

Labs are in the normal range. A noncontrast CT scan of the brain shows nonspecific age related changes. The patient and her family return to discuss the results. The two daughters are concerned that other family members may be at risk for developing AD.
Which of the following is the strongest risk factor for developing AD?

A) Age
B) Apolipoprotein E 4 allele
C) Family history
D) Head trauma
E) Low education level
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D) Head trauma
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Risk factors

• Definite
  – Age
  – Family history
  – APOE4 allele
  – Down syndrome

• Possible
  – Head trauma
  – Fewer years of formal education
  – Cardiovascular risk factors: HTN, DM, HLD, obesity
Assessment

• History
• Date of onset, nature of symptoms
• Medical history
• Medications
• Social
  – Living arrangements
  – Alcohol, drug use or abuse
  – Activities
## Assessment

<table>
<thead>
<tr>
<th>Activities of daily living (ADLs)</th>
<th>Instrumental activities of daily living (IADLs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding</td>
<td>Telephone</td>
</tr>
<tr>
<td>Continence</td>
<td>Shopping</td>
</tr>
<tr>
<td>Transferring</td>
<td>Preparing food</td>
</tr>
<tr>
<td>Toileting</td>
<td>Housekeeping</td>
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<tr>
<td>Dressing</td>
<td>Doing laundry</td>
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<tr>
<td>Bathing</td>
<td>Transportation</td>
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<tr>
<td></td>
<td>Medications</td>
</tr>
<tr>
<td></td>
<td>Finances</td>
</tr>
</tbody>
</table>
Regarding assessment tools used in the evaluation of memory loss, which of the following statements is most accurate?

A) The MMSE evaluates executive function and visual-spatial skills

B) Formal neuropsychological testing offers no benefit over the MMSE for detecting dementia

C) The use of a screening tool for depression is not helpful in the evaluation of memory loss

D) Clock drawing evaluates executive function and visual-spatial skills

E) The MoCA evaluates the ability to discern a chocolate coffee beverage from regular coffee
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<table>
<thead>
<tr>
<th>Cognition Screening</th>
<th>Domains</th>
</tr>
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<tbody>
<tr>
<td>Folstein’s MMSE</td>
<td>Orientation, registration, attention, recall, naming, repetition, 3 step command, language, visuospatial</td>
</tr>
<tr>
<td></td>
<td>19 items</td>
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<tr>
<td></td>
<td>Score 30</td>
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<tr>
<td>Mini Cog</td>
<td>Visuospatial, executive function, recall</td>
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<td></td>
<td>2 items</td>
</tr>
<tr>
<td></td>
<td>Score 5</td>
</tr>
<tr>
<td>MoCA</td>
<td>Orientation, recall, attention, naming, repetition, verbal fluency, abstraction, executive function, visuospatial</td>
</tr>
<tr>
<td></td>
<td>12 items</td>
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<tr>
<td></td>
<td>Score 30</td>
</tr>
<tr>
<td>SLUMS</td>
<td>Orientation, recall, calculation, naming, attention, executive function</td>
</tr>
<tr>
<td></td>
<td>11 items</td>
</tr>
<tr>
<td></td>
<td>Score 30</td>
</tr>
<tr>
<td>Neuropsychologic testing</td>
<td></td>
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<tr>
<td>Labs</td>
<td>Optional labs based on clinical exam</td>
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<td>-----------------------------</td>
<td>---------------------------------------------</td>
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<tr>
<td>CBC</td>
<td>LFTs</td>
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<tr>
<td>Na+</td>
<td>Folic acid</td>
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<tr>
<td>BUN/Cr</td>
<td>Urinalysis</td>
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<td>Fasting glucose</td>
<td>Toxicology</td>
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<tr>
<td>RPR</td>
<td>CSF analysis</td>
</tr>
<tr>
<td>TSH</td>
<td>HIV testing</td>
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<tr>
<td>Vitamin B12</td>
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**Consider imaging when:**

- Onset occurs at age < 65 years
- Neurologic signs are asymmetric or focal
- Clinic picture suggests NPH (CI, UI, gait imbalance)
- Recent fall or other head trauma

**Brain Imaging**

- MRI
- Non contrast CT
- PET
Management

• Pharmacologic
  – Cholinesterase inhibitors
  – Memantine
  – Antidepressants
  – Psychoactive medications
  – Other cognitive enhancers
Cholinesterase Inhibitors

- Multiple neurotransmitter systems deficits
- Most prominent is cholinergic deficit
- 40-90% Ach reduction seen compared to normal
- Loss of cholinergic neurons and Ach levels in the brain correlate with dementia severity
• Cholinesterase inhibitors:
  – Donepezil (Aricept)
  – Rivastigmine (Exelon)
  – Galantamine (Reminyl, Razadyne ER)
• Slow breakdown of acetylcholine
• Clinical trials show modest delay in cognitive decline compared to placebo
• GI side effects
• No evidence of difference in efficacy among drugs
Cholinesterase inhibitor

• Behavioral changes in LBD can benefit
• Rivastigmine is FDA approved for mild to moderate dementia in Parkinson dementia
• Treatment in FTD may worsen agitation
• Widespread use with vascular dementia not recommended
Optimizing therapy

- Starting early yields greatest benefit
- If taken off for some time, may not reach same level of benefit
- Switch from one AChEI to another
  - Due to side effects
  - For stabilization or improvement
- Slow titration up of dose
Memantine

- Namenda
- Neuroprotective effect is to reduce glutamate mediated excitotoxicity
- Modest benefit on cognition, ADLs, and behavior
- Limited effect on cognition and no evidence to support widespread use in vascular dementia
- FDA approved for moderate to severe AD
- Common side effects: constipation, dizziness, headaches
Management

• Cognition improves in only small number of patients
• No change may mean the treatment is helping
• Discuss expectations with patients and family members
BPSD

• ie irritability, anxiety, delusions, hallucinations, paranoia, aggressiveness

• Antidepressants
  – Falls and anticholinergic effects may worse confusion

• 1\textsuperscript{st} and 2\textsuperscript{nd} generation antipsychotics
  – Limited evidence of efficacy, use with caution

• Benzodiazepines and anticholinergic meds should be avoided
Management

• Cognitive rehab
• Orientation & memory measures: clocks, calendars, to do lists, visual clues, communication style
• Supportive individual and group therapy
• Physical and mental activity
• Regular appointments every 3-6 months
• Family and caregiver education and support
• Attention to safety
  – Supervision, wandering, driving
Other cognitive enhancers

- Vitamin E
  - Studies showed some decrease in risk for AD BUT can increase mortality especially in high doses!

- Ginkgo biloba
  - Not effective in preventing or delaying onset of dementia
Reducing Risk

1. Control cardiovascular disease and diabetes

2. Exercise regularly
   - Older adults doing moderate to vigorous activity decreased risk by 40%
   - Total brain and hippocampal volume increased linearly with physical activity
   - The 90+ Study
3. Eat a healthy diet
Reducing Risk

4. Engage in mentally stimulating activities
   - midlife TV viewing increased risk for developing AD
5. Stay socially active
   - a poor or limited social network in older adults increased risk for dementia by 60%
6. Decrease stress and anxiety
Resources

• Referrals to:
  – Geriatric psychiatrist
  – Neurologist
  – Neuropsychologist

• Social worker

• OT, PT
Resources

• Organizations
  – Alzheimer’s association
  – Council on Aging
• Community
  – Adult day care
  – Senior centers
  – Respite care
  – Home health agency
• Attorney
Summary

• Dementia is common in older adults but is not a part of normal aging
• AD is the most common type
• Evaluation should include:
  – detailed history with family member or caregiver
  – physical and functional assessment
  – Cognitive testing
  – labs and possible brain imaging
Summary

• Focus should be to enhance quality of life and function (cognition, mood, behavior)

• Pharmacologic and nonpharmacologic treatment options

• Resources to support patient, family, caregivers
Thank you 😊