Geriatric 4Ms
MENTATION AND MILD COGNITIVE IMPAIRMENT

Goals

► Define mild cognitive impairment
► Report epidemiology of MCI
► Identify MCI risk
► Diagnose MCI
► Treat MCI
Apply the Geriatric 4M’s in health care

MCI definition: a syndrome

Subjective cognitive problems (amnestic MCI if memory)

Objective cognitive decline in one or more domains

Preserved ADLs / IADLS

No dementia
Prevalence of **subjective** cognitive impairment

<table>
<thead>
<tr>
<th>Subjective cognitive impairment</th>
<th>young old</th>
<th>old</th>
<th>old - old</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prevalence of **objective** cognitive impairment (memory and / or other )

<table>
<thead>
<tr>
<th>Objective Cognitive Impairment</th>
<th>young old</th>
<th>old</th>
<th>oldest old</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Prevalence of MCI per age group

- 5 – 37 % when subjectively assessed
- 2 – 20 % when objectively evaluated
- No gender differences
- African Americans higher
- Diabetics higher
Rate of MCI progression to dementia

- 10 % per year (5 – 16 %)
- Conversion occurs mostly in years 2 - 3 rather than 4 - 5
MCI is Heterogenous

Types of Dementias

- Alzheimer's Disease
- Frontotemporal Dementia
- Corticobasal Degeneration
- Lewy Body Dementia
- Parkinson's Disease
- Vascular Dementia
- Mixed Dementia

MCI is Heterogenous
What predicts MCI conversion to dementia?

- Age
- Abnormal neuropsych tests
  - Delayed verbal recall
  - Visual recognition memory
  - IADL deficits

Psychological predictors

- Depression
- Apathy
- Anxiety
- Dysphoria
Physical performance predictors

SLOW GAIT (2X RISK)
MOTORIC COGNITIVE RISK SYNDROME
10 % OLDER ADULT POPULATION

Olfactory dysfunction

Brief Smell Identification Test Lower quartile performers:

• aMCI patients → dementia risk 5X
• Normal patients → MCI 2X
Do biomarkers identify risk of MCI conversion to dementia?

Apo E4

Linked to dementia and MCI but not MCI → Dementia
Disease linkages?

- Metabolic syndrome HR 4.25
- Diabetes HR 2.5

CSF Biomarkers

- Tau or Phospho Tau (Thr 181)
- Low amyloid beta 42 Ratios
Neuroimaging in MCI

MRI: Temporal lobe atrophy

Medial Temporal Lobe
FDG – PET and Functional MRI for regional brain hypometabolism

PET + impaired episodic memory → 11.7X conversion rate

Amyloid PET: tracer retention predicts conversion to AD

Tau PET: experimental

Diagnostic work up

Look for reversible causes of cognitive dysfunction

- Medication side effects
- Obstructive sleep apnea
- Depression
- Vitamin B12 deficiency
- Hypothyroidism
Diagnostic Work up

Traditional assessments

- MOCA
  - (score 19 – 25, average = 22)
- SLUMS
  - (score 21 – 26 > high school)
  - (score 20 – 24 < high school)

Quick screening tools

- Rapid Cognitive Assessment (SLUMS subset)
- Quick Mild Cognitive Impairment Screen
  - (doi: 10.3233/JAD-150881)
- Brain Check app
  - (doi: 10.2196/12615)
Treatment

Aggressive treatment of CV risk factors

- Hypertension (SPRINT TRIAL)
- Cholesterol management

Treatment

- Nutrition: Mediterranean or MIND diet
- Physical activity
  - MCI patients gain 1 point on cognitive exam post aerobic training
- Cognitive training programs
Treatment

DUAL TASK TRAINING FOR POSTURAL STABILITY

Not recommended

► Acetylcholinesterase inhibitors
  ► No impact on conversion, high GI side effects

► NSAIDs
  ► Despite lower risk of AD with chronic NSAID use, a rofecoxib study showed no effect in MCI patients.
Not recommended

- Ginkgo Biloba: RCT showed no benefit
- Phospholipids: mixed results
- Fish (omega) oils: no effect
- High dose vitamin B complex: no effect

Promising

- Intranasal insulin for aMCI
- GHRH
- Curcumin in cognitively intact
  - Verbal memory
  - Visual memory
  - Attention (Trail A test)
STAGES OF DEMENTIA