Geriatric Syndromes and Incident Disability in Older Women: Results from the Women’s Health Initiative Observational Study

Andrea L. Rosso
Women’s Health Initiative Investigator’s Meeting

5/2/13
Disability

- ~50% of Americans over 65 years disabled in 2006
  - 9% had disability in Activities of Daily Living
- Associated with higher rates of
  - Dependency
  - Usage of medical care
  - Hospitalization
  - Poor physical and mental health
  - Institutionalization
  - Mortality
Multi-System Dysfunction

- Disease in older ages characterized by
  - Multi-morbidity
  - Involvement of multiple physiological systems
  - Multiple underlying risk factors
  - Complexity
- Fewer than half of geriatric patients have a single clinical diagnosis
- Multi-morbidity increases risk of disability beyond risk from individual diseases
- More than half of disabled have impairments in multiple physiological systems
Geriatric Syndromes

- Occur in older, vulnerable adults
- Have multiple underlying factors
- Involve multiple organ systems
- Have shared risk factors
- Result from loss of compensatory mechanisms

Geriatric Syndromes

Lack of consensus on inclusion of specific conditions

- Depressive Symptoms
- Urinary Incontinence
- Sensory Impairment
- Cognitive Impairment
- Musculoskeletal Problems
- Falls
- Dizziness
- Syncope

- Bed Sores
- Delirium
- Malnutrition
- Weight Loss
- Polypharmacy
- Mobility Loss
- Sleep Problems
- Functional Decline
Multi-Morbidity of Geriatric Syndromes

- Frequently co-occur with one another and with chronic diseases
  - High prevalence
  - Shared risk factors
  - Overlapping pathways
  - Risk factors for one another
  - Treatments for one can increase risk for others

- Traditional measures of co-morbidity do not include geriatric syndromes
Geriatric Syndromes and Frailty

**Shared Risk Factors**
- Incontinence
- Falls
- Pressure Ulcers
- Delirium
- Functional Decline

**Geriatric Syndromes**

**Frailty**

**Poor Outcomes**
- Disability
- Dependence
- Nursing Home
- Death

GS Burden and Incident Disability

- Multi-morbidity of clinical diseases is known to be a risk factor for disability onset
- Cross-sectional studies have shown association of multiple geriatric syndromes with physical function/disability
- What is the association of multi-morbidity in geriatric syndromes with incident disability?

**Hypothesis:** Greater number of geriatric syndromes will be associated with greater risk for disability
Methods - Sample

- Analysis of women aged 65 years and older enrolled in the WHI Observational Study with 3 year follow-up (n=43,599)

- Exclusion
  - Died by follow-up (n=1,276)
  - Missing data (n=7,857)
  - Baseline disability (n=874)
  - History of or incident cancer (n=8,262)
Geriatric Syndromes – total of 10 at baseline:

- Depressive Symptoms (shortened CES-D/DIS; past 4 weeks)
- Dizziness (any past 4 weeks)
- Falls (≥2 in past year)
- Hearing Impairment (any trouble past 4 weeks)
- Osteoporosis (ever diagnosed)
- Polypharmacy (≥5 medications)
- Sleep Disturbance (≤5 hours of sleep/night; past 4 weeks)
- Syncope (past 12 months)
- Urinary Incontinence (≥ once/week; past year)
- Visual Impairment (any uncorrected trouble; past 4 weeks)
Methods - Measurements

- Chronic Diseases – total of 12 at baseline
  - Congestive heart failure
  - Diabetes
  - Myocardial infarction
  - Peripheral artery disease
  - Stroke
  - Transient ischemic attacks
  - Alzheimer’s disease
  - Arthritis
  - Stomach ulcers
  - Liver disease
  - Asthma
  - Emphysema
Methods - Measurement

- Disability – Incident inability or dependence in Activities of Daily Living (ADL) at 3 years
  - Eating
  - Dressing
  - Getting in and out of bed
  - Taking a bath or shower
Methods – Statistical Analysis

- Log binomial regression to calculate risk ratios (RR) and 95% confidence intervals (CI) of disability risk by number of geriatric syndromes
- All models adjusted for age, smoking and income
- Some models additionally adjusted for chronic diseases
Sample Characteristics

- 29,544 women included
  - Average age 70.1 years
  - 12.4% minority
  - 46% had 1 chronic disease; 21% had 2+ chronic diseases
- 742 (2.5%) women developed ADL disability by 3 years
## Prevalence of Geriatric Syndromes

<table>
<thead>
<tr>
<th>Geriatric Syndrome</th>
<th>Prevalence %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syncope</td>
<td>2.4</td>
</tr>
<tr>
<td>Sleep Disturbance</td>
<td>7.7</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>8.0</td>
</tr>
<tr>
<td>Falls</td>
<td>11.3</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>11.8</td>
</tr>
<tr>
<td>Dizziness</td>
<td>18.6</td>
</tr>
<tr>
<td>Visual Impairment</td>
<td>20.5</td>
</tr>
<tr>
<td>Polypharmacy</td>
<td>22.0</td>
</tr>
<tr>
<td>Hearing Impairment</td>
<td>29.2</td>
</tr>
<tr>
<td>Urinary Incontinence</td>
<td>29.3</td>
</tr>
</tbody>
</table>
Geriatric Syndromes and Chronic Diseases

The chart illustrates the relationship between the number of geriatric syndromes and the percent of women in each GS category. A bar graph shows the percent of women in GS categories ranging from 0 to 5+ geriatric syndromes, with the percentage increasing as the number of syndromes increases. A line graph plots the percent with 2+ chronic diseases against the number of geriatric syndromes, indicating a positive correlation between the two variables.
## Individual Geriatric Syndromes and Risk of Disability

<table>
<thead>
<tr>
<th>Geriatric Syndromes</th>
<th>Adjusted</th>
<th>Adjusted + Chronic Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RR (95% CI)</td>
<td>RR (95% CI)</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>2.41 (1.82–3.20)</td>
<td>2.10 (1.58–2.79)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>2.01 (1.59–2.56)</td>
<td>1.73 (1.35–2.20)</td>
</tr>
<tr>
<td>Falls</td>
<td>2.03 (1.54–2.67)</td>
<td>1.85 (1.41–2.44)</td>
</tr>
<tr>
<td>Hearing impairment</td>
<td>1.46 (1.04–1.66)</td>
<td>1.24 (0.98–1.57)</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>2.04 (1.56–2.67)</td>
<td>1.69 (1.29–2.23)</td>
</tr>
<tr>
<td>Polypharmacy</td>
<td>2.45 (1.96–3.07)</td>
<td>1.95 (1.54–2.46)</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>1.44 (1.01–2.07)</td>
<td>1.27 (0.88–1.82)</td>
</tr>
<tr>
<td>Syncope</td>
<td>1.94 (1.13–3.33)</td>
<td>1.77 (1.04–3.02)</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>1.44 (1.15–1.81)</td>
<td>1.27 (1.00–1.60)</td>
</tr>
<tr>
<td>Visual impairment</td>
<td>1.74 (1.37–2.21)</td>
<td>1.60 (1.26–2.04)</td>
</tr>
</tbody>
</table>
Risk of Disability by Number of Geriatric Syndromes
Conclusions

- Geriatric syndromes were common in this relatively healthy sample of older women.
- Having 3+ geriatric syndromes was associated with increased risk for disability over 3 years.
- This association was independent of age and chronic diseases.
Conclusions

- Mechanism is unclear
  - Shared risk factors
  - Frailty
  - Loss of compensatory mechanisms
  - Multisystem impairment
- Standardization needed on what is a geriatric syndrome
- Presence of multiple geriatric syndromes precedes disability onset and might be an important health indicator
WHI, Aging, Function, and Disability

Early Life
Growth and development

Adult Life
Maintaining highest possible level of function

Older Age
Maintaining independence and preventing disability

Functional Capacity

Range of function in individuals

Disability threshold*

Rehabilitation and ensuring the quality of life

Age

World Health Organization, 2002:
Acknowledgements

- Charles B Eaton, MD, MS
- Robert Wallace, MD, MS
- Rachel Gold, PhD, MPH
- Marcia L. Stefanick, PhD
- Judith K. Ockene, PhD, MEd, MA
- J. David Curb, MD, MPH
- Yvonne L Michael, ScD

- WHI participants

- This work was supported by the National Institute of Aging (R03AG031973). The WHI program is funded by the National Heart, Lung, and Blood Institute, National Institutes of Health, U.S. Department of Health and Human Services.