THE PERSON WITH DEMENTIA AND MULTIMORBIDITIES

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Dementia Care
March 7, 2016
CONFLICTS OF INTEREST

- No funding or speaking fees, honoraria or investments from industry
- Funding from CIHR, Research Manitoba, Riverview Foundation
- Chair, LTC formulary and member WRHA programme council
- Board member, Meals on Wheels (Manitoba)
Mr S

- 89 year old gentleman, living in house in rural MB with daughter

- Dependent in all IADLs, most ADLs

- Previous history of HBP, DM2, high cholesterol, OA, cataracts, diabetic retinopathy, diabetic neuropathy, PVD with chronic foot ulcer, COPD, IHD with CABG, CHF, Spinal Stenosis

- On dialysis – aggressive and combative

- Comes to Winnipeg for Colonoscopy

- Becomes agitated.
• Not oriented except to person

• Poor attention

• Hallucinations

• No previous cognitive assessments

• By collateral – at least a five year Hx of cognitive decline.
OBJECTIVES

- To define multimorbidity
- To describe the epidemiology of multimorbidity
- To describe the relationship between multimorbidity and dementia
- To describe the effect of multimorbidity on an individual with dementia
Questions

- Is Multimorbidity a risk factor for dementia?

- What is the effect of multimorbidity on dementia?
DEFINITIONS

• **Chronic disease**: health problems that require ongoing management over a period of years or decades.

• **Multimorbidity**: the coexistence of multiple chronic diseases and medical conditions in the same individual (usually defined as two or more conditions).

• **Co-morbidity**: any distinct additional entity that has existed or may occur during the clinical course of a patient who has the index disease under study.
• Defined as $\geq 3$ chronic diseases

• Has distinctive cumulative effects for each individual

• Associated with increased rates of:
  - Death
  - Disability
  - Adverse effects
  - Institutionalization
  - Use of health care resources
  - Impaired QOL
Even when diagnosed with the same pattern of conditions, older adults with multimorbidity are heterogeneous in terms of:

- Illness severity
- Functional status
- Prognosis
- Personal priorities
- Risk of adverse events

Treatment options also differ

So multimorbidity requires a flexible approach to care
HISTORICALLY

• Link between health and cognition is old

• Dementia was thought to be a “Giant of Geriatrics”
  • Multifactorial causation
  • Morbidity high; mortality low
  • Blurry line between normal and abnormal
  • Associated with other diseases and non-medical factors
  • Needing multidimensional intervention
This is not a new idea

**Physical Findings**

Our most striking observation was the frequency of multiple disabilities. Men had a mean of 3.26 disabilities, of which 1.87 were unknown to the family doctor; women a mean of 3.42 disabilities, with 2.03 unknown (1.14, 2.91). The number of disabilities was significantly higher.
MEDICAL AND NURSING NEEDS

The medical staff of the department is available to treat all patients in the different parts of the scheme. Naturally patients in the initial-treatment ward need the most attention, with daily visits from the senior medical staff. About two-thirds of the patients have multiple pathological conditions. About 31% (with seasonal variations) have acute illnesses. A further 28% have acute illnesses in addition to long-term disorders, and these patients tend to remain longest in the initial-treatment ward. If it seems
Health and Cognition in the Wolverhampton Inquiry, 1947

The bar chart illustrates the distribution of health and cognition categories among the study participants. The categories include:

- Normal
- Slight impairment
- Childish Difficult to live with
- Demented
- Eccentric

Each bar is divided into three segments, representing different levels of impairment:

- Normal plus: Light shade
- Normal: Dark shade
- Subnormal: Darkest shade

The chart shows the percentage distribution across these categories.
Hippocrates Nailed It

St John and Montgomery, BMJ, 2014
Clinically

- Almost all major health problems are associated with cognitive complaints and impairment
  - Chemo brain
  - CABG head/Pump head
  - Dialysis dysequilibrium syndrome
  - Punch drunk (Punchy)
Some diseases may be protective

Harvard research finds protective link between most cancers and Alzheimer’s disease

They are both dreadful conditions, but it appears cancer reduces the risk of developing Alzheimer’s disease, especially among people treated with chemotherapy. That’s the word from a Harvard-based study presented July 2013 at the Alzheimer’s Association International Conference. Researchers at the Harvard-affiliated VA Boston Healthcare System analyzed the health records of 3.5 million veterans ages 65 and older and concluded that most types of cancer—except melanoma, prostate, and colorectal cancers—were associated with a reduced Alzheimer’s risk, ranging from 9% to 51%. But the protective association was only with Alzheimer’s disease; cancer was associated with a higher risk of stroke, osteoarthritis, cataracts, and macular degeneration. Most cancer survivors were also at increased risk for non-Alzheimer’s dementia. Still, researchers say the study results could help focus future research, potentially opening new therapeutic strategies for Alzheimer’s prevention and treatment.

But maybe because they are more likely to die first
The Life Course Approach

- Physiological Deterioration
- Diseases Conditions
- Frailty Disability Functioning Loss
- Death
PREVALENCE OF MULTIMORBIDITY

• Depends Upon
  • Definition
  • Diseases included
  • Source of data
  • Population of study

• No matter how defined
  • Common
  • Age related
PREVALENCE OF DEMENTIA

• Depends Upon
  • Definition
  • Diseases included
  • Source of data
  • Population of study

• No matter how defined
  • Common
  • Age related
In Scotland

Figure 1. Number of chronic disorders by age-group

Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study
Some Diseases Like Company

Supplementary figure S1: Number of conditions experienced by patients with common, important diseases

<table>
<thead>
<tr>
<th>Condition</th>
<th>This condition only</th>
<th>This condition + 1 other</th>
<th>+ 2 others</th>
<th>+ 3 or more others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>3</td>
<td>9</td>
<td>14</td>
<td>74</td>
</tr>
<tr>
<td>Stroke/TIA</td>
<td>6</td>
<td>14</td>
<td>18</td>
<td>62</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>7</td>
<td>13</td>
<td>16</td>
<td>65</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>9</td>
<td>16</td>
<td>19</td>
<td>56</td>
</tr>
<tr>
<td>Painful condition</td>
<td>13</td>
<td>21</td>
<td>21</td>
<td>46</td>
</tr>
<tr>
<td>Diabetes</td>
<td>14</td>
<td>20</td>
<td>19</td>
<td>47</td>
</tr>
<tr>
<td>COPD</td>
<td>18</td>
<td>19</td>
<td>17</td>
<td>47</td>
</tr>
<tr>
<td>Hypertension</td>
<td>22</td>
<td>24</td>
<td>19</td>
<td>35</td>
</tr>
<tr>
<td>Cancer</td>
<td>23</td>
<td>21</td>
<td>17</td>
<td>39</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>31</td>
<td>23</td>
<td>17</td>
<td>29</td>
</tr>
<tr>
<td>Asthma</td>
<td>48</td>
<td>23</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Dementia</td>
<td>5</td>
<td>13</td>
<td>18</td>
<td>64</td>
</tr>
<tr>
<td>Anxiety</td>
<td>7</td>
<td>17</td>
<td>20</td>
<td>56</td>
</tr>
<tr>
<td>Schizophrenia/bipolar</td>
<td>13</td>
<td>21</td>
<td>21</td>
<td>46</td>
</tr>
<tr>
<td>Depression</td>
<td>23</td>
<td>22</td>
<td>21</td>
<td>36</td>
</tr>
</tbody>
</table>

Percentage of patients with each condition who have other conditions

- Blue: This condition only
- Light blue: This condition + 1 other
- Medium blue: + 2 others
- Dark blue: + 3 or more others
Social Position and Multimorbidity

Figure 2. Prevalence of multimorbidity by age and socioeconomic status
On socioeconomic status scale, 1=most affluent and 10=most deprived.
Incidence Increases with Age

Incidence of 3 conditions varies with age, showing a clear increase with age, particularly after 50 years. The incidence is higher in women compared to men. The graph illustrates the trend across different age groups, with the incidence rate per 1,000 person-years on the y-axis and age in years on the x-axis.
Dementia is very common too

Figure 6. Percent with dementia by age (2000–2010), Health and Retirement Study, age 75 years and older. Source: Calculations from Health and Retirement Study data. Dementia based on method in Crimmins et al. (2011).
Common Overlapping Syndromes
PREVALENCE OF BOTH

• Not actually known for sure

• Likely close to universal in LTC world-wide

• It is certainly not unusual
Summary of the Epidemiology

- Both multimorbidity and dementia are common
- Both are strongly related to age
- Both are strongly related to social position
Does multimorbidity Predict Dementia

- Probably

- Vascular risk factors in mid-life predict dementia, though probably not vascular risk factors in late life

- There seems to be an effect of general health

- Frailty likely predicts dementia
## Table 2

Association between baseline self-rated health and the risk of incident dementia over 8 years of follow-up using a Cox proportional hazard regression model

<table>
<thead>
<tr>
<th>Self-rated health</th>
<th>% (N)</th>
<th>Event/1,000 person-years</th>
<th>Crude HR (95% CI) p</th>
<th>Adjusted(^a) HR (95% CI) p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>6.3 (311)</td>
<td>10.6</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Fair</td>
<td>9.0 (259)</td>
<td>16.4</td>
<td>1.61 (1.36-1.90) &lt;0.0001</td>
<td>1.34 (1.13-1.59) 0.0009</td>
</tr>
<tr>
<td>Poor</td>
<td>12.5 (48)</td>
<td>24.8</td>
<td>2.49 (1.83-3.37) &lt;0.0001</td>
<td>1.70 (1.22-2.37) 0.002</td>
</tr>
</tbody>
</table>
But....

Self-rated health

V Poor
Poor
Not too good
Pretty good
V Good

Status at time 2 (percent)

Intact
CIND
Dementia
Dead

St John & Montgomery, 2013
SRH in CIND

Self-rated health
- Very poor
- Poor
- Not too good
- Pretty good
- Very good

Status at time 2 (percent)
- 100
- 90
- 80
- 70
- 60
- 50
- 40
- 30
- 20
- 10
- 0

Intact
- CIND
- Dementia
- Dead

Self-rated health
Multimorbidity Predicts

- Death
- Reduced quality of life
- Reduced functional status
- Institutionalization
Cumulative probability of survival to age 85 by number of diseases diagnosed before age 75.

Robert B. Tate et al. The Gerontologist 2012; geront.gns050
MULTIMORBIDITIES PREDICT DEATH

Number at risk

<table>
<thead>
<tr>
<th>Time (days)</th>
<th>0</th>
<th>1-3</th>
<th>4-6</th>
<th>7+</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>88</td>
<td>662</td>
<td>605</td>
<td>396</td>
</tr>
<tr>
<td>1-3</td>
<td>88</td>
<td>643</td>
<td>576</td>
<td>362</td>
</tr>
<tr>
<td>4-6</td>
<td>85</td>
<td>606</td>
<td>526</td>
<td>327</td>
</tr>
<tr>
<td>7+</td>
<td>73</td>
<td>499</td>
<td>425</td>
<td>258</td>
</tr>
<tr>
<td>1000</td>
<td>27</td>
<td>111</td>
<td>113</td>
<td>87</td>
</tr>
<tr>
<td>1500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

St John et al, CFP, 2014
How much do your health problems interfere with your life?

Functional status

- A great deal
- A little
- Not at all

Number at risk:
- Good: 1307, 1356, 1114, 847, 184
- Mild: 450, 429, 380, 299, 106
- Moderate/severe: 214, 194, 150, 109, 48
<table>
<thead>
<tr>
<th>TABLE 2. The association between multimorbidity and 5-year mortality in community-dwelling older adults: ( N = 1751 ).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FACTOR</strong></td>
</tr>
<tr>
<td>Comorbid conditions</td>
</tr>
<tr>
<td>Older age</td>
</tr>
<tr>
<td>Female sex</td>
</tr>
<tr>
<td>More education</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
</tr>
<tr>
<td>• Never married</td>
</tr>
<tr>
<td>• Married</td>
</tr>
<tr>
<td>• Separated or divorced</td>
</tr>
<tr>
<td>• Widowed</td>
</tr>
<tr>
<td><strong>MMSE score</strong></td>
</tr>
<tr>
<td><strong>CES-D score</strong></td>
</tr>
<tr>
<td><strong>Functional status</strong></td>
</tr>
<tr>
<td>• Excellent or good</td>
</tr>
<tr>
<td>• Mild impairment</td>
</tr>
<tr>
<td>• Moderate or severe impairment</td>
</tr>
</tbody>
</table>

CES-D—Centre for Epidemiologic Studies Depression Scale; MMSE—Mini-Mental State Examination.
Frailty Predicts Death

[Graph showing survival probability over time with different frailty scores]

Rockwood et al, CMAJ, 2007
Frailty Predicts Institutionalisation
Frailty Predicts Death in All Adult Age Groups

Song et al, JAGS, 2010
Cumulative Effect of Frailty and Cognitive Loss

St John et al, unpublished (for this talk)
PROGNOSTIC INDICES ARE FRAILTY MEASURES AND INCLUDE MULTIMORBIDITY
The most spectacular Kaplan-Meier I've ever seen.
Are people in research trials representative of people with dementia?
Key points

• Dementia is a growing health challenge for primary and secondary care providers worldwide.
• CONSORT statement recommends participant demographic information be provided to ease trial generalisability.
• Currently, medical co-morbidities and medicine prescribing is poorly reported in randomised controlled trials in dementia.
• Future research must address this limitation to improve reporting of medical comorbidities and prescribed medications.
Who Cares?

• Policy
  • We need care models that accept complexity and are flexible
  • We need shared decision making
  • Guidelines are problematic for care
  • We need to accept limited victories
  • We need to include frail older adults with dementia in clinical trials

• Can’t ignore generalists and primary care

• Risk adjustment models (eg LOS, readmission, etc) need to measure cognition, function and the burden of disease, and need to be interpreted cautiously.
• Prevention

• There will be no silver bullet
• We need scatter shot

• Preventing completely dementia is an unrealistic goal

• Delaying the onset and improving quality of life for those with dementia is not
CLINICIANS

- Need to accept complexity

- Need to when to follow guidelines, and when not to (willfully)

- Need to work in teams

- Need to think about how the person got here and where they are going

- Need to know that prognostication is difficult, but still a duty of care
ISSUES FOR EVERYONE

• Burden of care

• Fragmented care

• Prognostication

• Cost

• Reduced quality of life
• Polypharmacy

• Drug disease interactions
  • Eg GI disease and COPD in those on cholinesterase inhibitors
  • Eg Parkinson syndromes and neuroleptics
  • Eg tight control of diabetes

• Drug drug interactions
  • Cholinesterase inhibitors and anticholinergics
APPROACH

- Patient preferences
- Interpreting the evidence
- Prognosis
- Clinical feasibility
- Optimizing therapies and care plans
FAMILIES

• A lot seem to understand this already

• The ones that don’t may never
PEOPLE

• Should stay active and healthy

• Should have a Plan B
My Thoughts

• We need to rethink late life cognitive loss

• Need to accept complexity
  • Multiple risk factors in multiple domains
  • Time frames
  • Competing risks
  • Bidirectional causation
IMPLICATIONS

- There will be no silver bullet for dementia
BUT

- Population Health
  - Education
  - Improved general health of population
  - Access to health care
  - Attention to broad determinants of health
- Incremental gains in several domains may chip away at prevalence of dementia
Questions

• Is Multimorbidity a risk factor for dementia?
  • Probably

• What is the effect of multimorbidity on dementia?
  • Lower survival
  • Lower quality of life
  • Complicates treatment