Association of Frailty with Emotional Health of Older Patients with Advanced Cancer: A University of Rochester NCI Community Oncology Research Program (NCORP) Geriatric Assessment Trial

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Conflict of Interest Disclosure
Nikesha Gilmore, PhD

Has no real or apparent conflicts of interest to report.
Background

- Emotional health is an important factor in overall health
- Psychological stress is prevalent in older patients
  - 12% to 20% experience significant depressive symptoms
  - 1.2% to 15% have generalized anxiety disorder
- Psychological stress associated with cancer and its treatments can negatively impact:
  - Quality of Life
  - Social functioning
- Depression is associated with increased mortality

Pal et al. 2010; Bryant et al. 2018; Karunanithi et al. 2018; Pinquart et al. 2010
Background

• Frailty is prevalent in older adults-
  – 4.0% to 59.1% community dwelling older adults
  – 42% in older patients with cancer
• Frailty is an age-related syndrome
  – Characterized by weakness and fatigue
• Frail older adults with cancer are susceptible to increased morbidity, mortality, and decreased quality of life

Background

• In community dwelling older adults
  – Combination of depression and frailty increases risks of negative outcomes including cognitive impairment and mortality

• The effect of the combination of psychological stress with frailty in older patients with advanced cancer is not completely understood

Lee et al. 2018
Objectives

- To estimate the prevalence of frailty, anxiety, depression, and distress in older adults with advanced cancer.
- To examine the relationships between frailty and emotional health in older adults with advanced cancer.

Hypothesis: Patients with advanced cancer with the greatest degree of frailty will have highest odds of depression, anxiety, and distress.
Study Design

Cross-sectional analysis of baseline data from a University of Rochester NCI Community Oncology Research Program (NCORP) Geriatric Assessment Trial (URCC 13070; PI Dr. Mohile; presented at ASCO 2018)
Study Design for the COACH Trial

Secondary Analysis Conducted on Baseline Data Collected Prior to Intervention

COACH Outcomes
- Communication
- Satisfaction with communication
  - Patient and caregiver
- Quality of Life
  - Patient and caregiver reported

Arm 1
GA summary and GA-guided interventions provided to patient, caregiver, and physician.
Study Participants

- Aged ≥70 years
- Had a diagnosis of incurable stage III/IV solid tumor or lymphoma
- Were considering or receiving any kind of cancer treatment (any line)
- Had ≥1 impaired domain on geriatric assessment
Recruited from 31 community oncology practices from October 2014 to April 2017
Outcome Variables

- **Depression**: Geriatric Depression Scale (GDS)
  - Self-reported 15-item screening tool for depression in older adults
  - Cutoff for impairment ≥5

- **Anxiety**: Generalized Anxiety Disorder-7 (GAD-7)
  - Self-reported 15-item measure used to screen for and determine the severity of generalized anxiety disorder.
  - Cutoff for impairment ≥10

- **Distress**: Distress Thermometer
  - A self-reported measure to screen for psychological distress in patients with cancer.
  - Cutoff for impairment ≥4
Deficit Accumulation Frailty Index (DAFI) based on Geriatric Assessment

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>No Frailty (+0)</th>
<th>Frailty (+1)</th>
<th>Frailty (+2)</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital Status</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>IADL</td>
<td>X</td>
<td>X</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>ADL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>6</td>
</tr>
<tr>
<td>Patient KPS</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Fall History</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Meds</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>15</td>
</tr>
<tr>
<td>Weight loss</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Depression</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Anxiety</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Social Activities</td>
<td>X</td>
<td>X</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Medical Social Support</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>Physician KPS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>TUG</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Cognition/Memory</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>BMI</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Creatinine Clearance</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Albumin</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Liver Function</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
</tbody>
</table>

- Items with binary answers were coded as “0” if adverse event was absent and “1” if present.
- Items with graded response “0” absence of condition, “1” intermediate, “2” most adverse.
- Total 50 Items

DAFI = \[
\text{Actual Deficit Score} \div \text{Potential Deficit Score}
\]

Modified DAFI - Removal of psychological variables

Jones and Rockwood 2004; Searle et al. 2008; Cohen et al. 2017
Covariates

Demographics
- Age
- Gender
- Race
- Education
- Marital Status
- Income
- Caregiver (enrolled with participant)

Clinical Variables
- Cancer Type
- Cancer Stage
- Cancer Treatment
Statistical Analyses

• Bivariate analyses:
  – to examine the associations with frailty and emotional health outcomes (depression, anxiety, and distress)

• All variables in the bivariate analyses with a p-value $\leq 0.16$ were entered into a multivariate logistic regression
### Results: Sample Characteristics; N=541

<table>
<thead>
<tr>
<th>Age, mean (SD)</th>
<th>76.6 (5.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female 264 (48.8)</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Non-Hispanic white 482 (89.1)</td>
</tr>
<tr>
<td>Education</td>
<td>Some college or above 279 (51.6)</td>
</tr>
<tr>
<td>Income</td>
<td>≤$50,000 265 (49.0)</td>
</tr>
<tr>
<td>Cancer type</td>
<td>Gastrointestinal 138 (25.5)</td>
</tr>
<tr>
<td></td>
<td>Lung 140 (25.9)</td>
</tr>
<tr>
<td></td>
<td>GU 79 (14.6)</td>
</tr>
<tr>
<td></td>
<td>Breast 69 (12.8)</td>
</tr>
<tr>
<td></td>
<td>Other 114 (21.1)</td>
</tr>
<tr>
<td>Cancer stage</td>
<td>Stage III 47 (8.7)</td>
</tr>
<tr>
<td></td>
<td>Stage IV 480 (88.7)</td>
</tr>
<tr>
<td></td>
<td>Others 13 (2.4)</td>
</tr>
<tr>
<td>Cancer treatment</td>
<td>Chemotherapy 369 (68.2)</td>
</tr>
<tr>
<td></td>
<td>Other 172 (31.8)</td>
</tr>
</tbody>
</table>
Results: Geriatric Assessment Domain Impairments

Geriatric Assessment Domains

- Psychological Status: 25.1%
- Cognition: 28.8%
- Social Support: 33.3%
- Function Status: 59.0%
- Nutrition: 60.3%
- Comorbidity: 63.8%
- Polypharmacy: 83.7%
- Physical Performance: 93.7%
Results: Prevalence of Frailty (DAFI) at Baseline

DAFI Cut Offs
- Robust/Fit = 0 to <0.2
- Pre-Frail = 0.2 to <0.35
- Frail ≥ 0.35

31% 27%
42%
Results: Prevalence of Depression, Anxiety, and Distress

- **Prevalence of Depression**: Meets cutoff, 22%
- **Prevalence of Anxiety**: Meets cutoff, 36%
- **Prevalence of Distress**: Meets cutoff, 9%

- **Does not meet cutoff**
- **Meets cutoff**

- **≥5 GDS**
- **≥10 GAD-7**
- **≥4 Distress Thermometer**
Association of Frailty with Anxiety (GAD7)

Pre-Frail vs Robust

Less Anxious       More Anxious

DAFI

Adjusted DAFI
(removal of GAD-7 and GDS)

*All models included age, gender race and cancer type as covariates. In addition, we implemented step wise procedure to select additional covariates with $p<0.16
Association of Frailty with Depression (GDS)

Pre-Frail vs Robust

Less Depressed  More Depressed

4.4* (1.8-10.8)
2.1* (1.1-4.3)

Pre-Frail vs Robust

Less Depressed  More Depressed

25.4* (10.3-62.6)
10.6* (5.3-21.1)

*All models included age, gender race and cancer type as covariates. In addition, we implemented step wise procedure to select additional covariates with p<0.16
Association of Frailty with Distress (Distress Thermometer)

<table>
<thead>
<tr>
<th>Less Distressed</th>
<th>More Distressed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Frail vs Robust</strong></td>
<td><strong>Frail vs Robust</strong></td>
</tr>
<tr>
<td>1.9* (1.1-3.1)</td>
<td>1.9* (1.1-3.0)</td>
</tr>
</tbody>
</table>

*All models included age, gender race and cancer type as covariates. In addition, we implemented step wise procedure to select additional covariates with p<0.16.
Strengths

• To our knowledge this is the first study to demonstrate the odds of distress and anxiety in frail older adults with cancer

• A large sample of older adults with cancer receiving cancer treatment in the community oncology practices
Limitations

- Cross sectional study
  - We are unable to demonstrate causality
- Included a small percentage of non-white patients (10%)
- Did not assess patients for history of depression, anxiety, and distress
Conclusions

• Our results demonstrate that in older patients with advanced cancer, frailty is associated with poorer emotional health

• Strong link between frailty and emotional health
  — Provides additional support for formal assessment of frailty in older adults with cancer

• Interventions aimed at improving frailty might also improve emotional health
  — Older adults are more reluctant to disclose psychological issues
Acknowledgements

• Participants

• NCORP Community Affiliate and Research Base staff and investigators

• Co-authors
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Questions?

Thank you.