A Longitudinal Assessment on the Impact of Higher Body Mass Index on Cancer-Related Fatigue in Breast Cancer Patients

Julia E. Inglis, PhD, RD
Assistant Research Professor
Division of Cancer Control, Department of Surgery, Wilmot Cancer Institute, University of Rochester Medical Center

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# Faculty Disclosure

X  No, nothing to disclose

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INTRODUCTION

Obese patients w/ breast cancer:
- Chronic low-grade inflammation
- Functionality & QOL
- All-cause mortality

Increased inflammation is also assoc. w/ greater levels cancer-related fatigue:
- Most distressing symptom of cancer + cancer treatment, up to 10 yrs.
- Not relieved by sleep/rest.
Patients obese at diagnosis:
- Poor nutrition
- Inactivity

Obese Patients with Breast Cancer

Involuntary Weight Gain from Treatment
- Chemotherapy
- Steroids
- Hormone therapy
- Physical Inactivity

Increased Inflammation
- Chronic low-grade inflammation: C-reactive protein
- Pro-inflammatory cytokines- IL-6, IL-1, TNF-α
- Insulin resistance

CANCER-RELATED FATIGUE

SARCOPENIC OBESITY
- Increased fat mass
- Loss of lean mass + strength
- DECREASED functionality
Specific Aim

To evaluate the impact of obesity on CRF in breast cancer patients through a secondary analysis of a prospective study of breast cancer patients beginning chemotherapy.
Schema
Cross-Sectional Study
Large Nationwide Sample

Screening
Informed Consent

(T1) Assessment 1
(Within 7 days prior to first chemotherapy)
All study subjects

(T2) Assessment 2
(Within 1 month following completion of chemotherapy)
All study subjects

(T3) Assessment 3
(At six mos. following Assessment 2)
All study subjects

- On-Study Data form
- Clinical Record
- Medication Usage

- Medication Usage Update
- Cancer Treatment Dosage Form

Self Report Measures (At clinic or home)
- Symptom Inventory (Single items related to memory, executive function, attention, etc.)
- MFSI (fatigue)
URCC NCORP Research Base Clinical Trial Network

- 12 (22) NCORPs/MU-NCORPs
- 444 sub sites
<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal (n=129)</th>
<th>Overweight (n=147)</th>
<th>Obese (n=294)</th>
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</thead>
<tbody>
<tr>
<td><strong>Body Mass Index, (mean, SD)</strong></td>
<td>22.51±1.66**</td>
<td>27.47±1.41</td>
<td>36.80±5.84**</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>51.81±10.97</td>
<td>53.8±10.97</td>
<td>54.19±10.18</td>
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<tr>
<td><strong>Race (n, %): White</strong></td>
<td>119 (92%)</td>
<td>135 (91.8%)</td>
<td>253 (86%)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (8%)</td>
<td>12 (8.2%)</td>
<td>41 (14%)</td>
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<tr>
<td><strong>Premenopausal</strong></td>
<td>62 (48%)*</td>
<td>48 (33%)*</td>
<td>110 (37.4%)*</td>
</tr>
<tr>
<td><strong>Postmenopausal</strong></td>
<td>64 (50%)*</td>
<td>99 (67%)*</td>
<td>184 (62.5%)*</td>
</tr>
<tr>
<td><strong>Unknown</strong></td>
<td>3 (2%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Stage 1</td>
<td>31 (24%)</td>
<td>43 (29.3%)</td>
<td>81 (27.6%)</td>
</tr>
<tr>
<td>Stage 2</td>
<td>62 (48%)</td>
<td>70 (47.6%)</td>
<td>142 (48%)</td>
</tr>
<tr>
<td>Stage 3</td>
<td>22 (17%)</td>
<td>29 (19.7%)</td>
<td>56 (19%)</td>
</tr>
<tr>
<td><strong>Unknown</strong></td>
<td>14 (11%)</td>
<td>5 (3.4%)</td>
<td>15 (5%)</td>
</tr>
<tr>
<td>Radiation</td>
<td>69 (53.5%)</td>
<td>92 (63%)</td>
<td>168 (57%)</td>
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*p-value significant < .05, **p-value significant < .0001
571 female breast cancer patients, aged 53±10.61

T1. Categorized by BMI:
- Obese (OB: \( \geq 30.0 \) kg/m\(^2\); n=294, 51%)
- Overweight (OV: 25.0-29.9 kg/m\(^2\); n=147, 26%)
- Normal wt. (NW: 18.5-24.9 kg/m\(^2\); n=129, 23%)
METHODS

Cancer-Related Fatigue Symptoms:

Multidimensional Fatigue Symptom Inventory (MFSI) + Symptom Inventory (SI)
at T1, T2 & T3.
Results

T1. Obese higher CRF than normal wt:
   - MFSI Total: OB = 11.4 vs NW = 8.1; p=0.03
   - SI Fatigue: OB = 3.5 vs NW = 2.9; p=0.02

T2. Higher SI Fatigue scores for obese than normal wt:
   - OB = 4.4 vs NW = 3.8; p=0.02

T1-T3. Obese maintained more severe MFSI scores:
   - General, Mental & Emotional subscales (p<0.05).
RESULTS

*P*-value obese vs. normal weight subjects
Summary

A cross-sectional analysis from a longitudinal prospective study: Obese breast cancer patients suffered greater fatigue than normal weight subjects

- T1
- T2
- T3
DISCUSSION

- In our study, obese breast cancer patients suffered greater fatigue than normal weight patients.

- Chronic low grade inflammation, sarcopenic obesity & loss of function.

- Diet/Wt. loss interventions preceding or combined w/exercise interventions to address fatigue

- More Phase 1-3 clinical trials are needed.
Involuntary Weight Gain

- Chemotherapy
- Steroids
- OBESITY: pro-inflammatory cytokines - IL-6, IL-1, TNF-α
- Insulin resistance
- Chronic low-grade inflammation

Interventions

- Dietary changes:
  - Lean protein
  - Whole grains
  - Calcium
  - Fruits & Vegetables
- Resistance exercise
- Yoga

SARCOPENIC OBESITY

- Increased fat mass
- Loss of lean mass + strength
- DECREASED functionality

CANCER-RELATED FATIGUE
Future Research Direction

• **Pilot Study**: proprietary functional food bar, guarana + protein powder for cancer survivors to improve energy and lean mass

• **Cancer-related fatigue** interventions combining exercise w/nutrition.

• **Future K-award** – possibly combined modality
Questions?
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