Early Changes in Physical Activity and Quality of Life with Thoracic Radiation Therapy for Breast Cancer, Lung Cancer, and Lymphoma

Sheela Krishnan, MD1, Hari Narayan, MD, MSCE2, Gary Freedman, MD3,4, Biniyam Demissie, MD, MSCE, PhD1, Amanda M. Smith, MS1, John P. Plastaras, MD, PhD3,4, Steven Feigenberg, MD3,4, Bonnie Ky, MD, MSCE1,4

1Department of Medicine, Division of Cardiology, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, 2Department of Pediatrics, University of California San Diego, San Diego, CA, 3Department of Radiation Oncology, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, 4Abramson Cancer Center, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA

BACKGROUND

- Effects of thoracic radiation therapy (RT) on early changes in detailed measures of physical functioning and quality of life (QoL) are incompletely defined
- Evidence suggests that exercise can improve QoL for cancer patients

OBJECTIVE

To examine the associations between thoracic RT dose volume metrics, physical activity, and QoL

METHODS

- Prospective, longitudinal cohort study of 130 participants with breast cancer, lung cancer, or mediastinal lymphoma initiating therapy with chemoradiation from 2015-2018 (NCT02769299)
- Data collected at 3 timepoints: (1) Pre-RT, (2) Immediately post-RT, (3) 5-9 months post-RT
- Self-reported physical activity via the Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ)
- QoL metrics of fatigue and dyspnea via Functional Assessment of Chronic Illness Therapy (FACIT) Fatigue and Dyspnea Scales
- Stratified analyses by subgroup: (1) Breast cancer alone, (2) Lung cancer and lymphoma combined
- Two-sided paired t-tests to evaluate changes over time
- Generalized estimating equations (GEE) with an independence correlation structure and a robust variance estimator to evaluate the (1) association between RT dose-volume metrics and changes in GSLTPAQ and QoL metrics, (2) association between GSLTPAQ and QoL

RESULTS

Table: Baseline Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Overall (n=130)</th>
<th>Breast Cancer (n=80)</th>
<th>Lung Cancer or Lymphoma (n=30)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>53.9 [44.5-62.1]</td>
<td>53.5 [44.5-62.1]</td>
<td>54.3 [53.0-64.1]</td>
<td>0.030</td>
</tr>
<tr>
<td>Female Sex, n (%)</td>
<td>102 (78.5)</td>
<td>80 (100.0)</td>
<td>22 (44.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Race, n (%)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Caucasian</td>
<td>889 (68.5)</td>
<td>85 (108.2)</td>
<td>24 (48.0)</td>
<td></td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>526 [50.4-60.0]</td>
<td>526 [50.4-60.0]</td>
<td>526 [50.4-60.6]</td>
<td>0.414</td>
</tr>
<tr>
<td>Current or Prior Smoking, n (%)</td>
<td>313 (24.0)</td>
<td>28 (25.2)</td>
<td>25 (83.3)</td>
<td>0.235</td>
</tr>
</tbody>
</table>

- In breast cancer, lung cancer, and lymphoma (Table), changes were observed in physical activity and QoL over time (Figure)

CONCLUSIONS

- Increased RT dose to the heart is associated with increased fatigue and dyspnea and decreased physical activity, particularly in lung cancer or lymphoma
- Increased physical activity prior to and during RT is associated with improved QoL
- Strategies to decrease MHD and increase physical activity may improve QoL with RT


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