Impact of Weight Loss on Grip Strength in Head and Neck Cancer Patients Receiving Radiation Therapy

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Specific Aims

1. To implement dynamometer assessment of handgrip strength as part of the nutrition assessment for head and neck cancer patients receiving radiation therapy.
2. To investigate the relationship between handgrip strength and weight loss before and during seven weeks of radiation therapy.

Methods

- Prospective study conducted through OHSU’s Radiation Oncology Clinic.
- Eleven subjects diagnosed with head and neck cancer and prescribed seven weeks of radiation therapy.
- Hand grip strength, assessed by the Jamar® Plus Hydraulic Hand Dynamometer, and weight were recorded at the first and last week of radiation as well as the first follow-up visit.
- Each hand was measured three times and the average was calculated. Hand dominance was noted.
- Subjects were classified as malnourished if they met the Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition (AND/ASPEN) malnutrition criteria for weight loss and reduced grip strength. Reduced grip strength was defined as a grip strength two standard deviations (SD) below the normative standards provided with the dynamometer.
- Descriptive statistics were used to describe the subject population, changes in grip strength and changes in weight. Correlation between change in grip strength and change in weight was performed using Pearson's correlation.

Results

Table: Change in Grip Strength and Weight

<table>
<thead>
<tr>
<th></th>
<th>Average Change in Weight (kg)</th>
<th>Average Change in Grip Strength (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial treatment</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Last treatment</td>
<td>-1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Follow-up</td>
<td>-2.1</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Key Findings

- Average left handgrip strength:
  - Initial treatment: 33.2 kg ± 8.0 kg
  - Last treatment: 32.1 kg ± 9.1 kg
  - Follow-up: 29.3 kg ± 12.9 kg

- Average right handgrip strength:
  - Initial treatment: 35.3 kg ± 5.6 kg
  - Last treatment: 34.6 kg ± 7.7 kg
  - Follow-up: 29.4 kg ± 7.9 kg

Conclusions

- On average handgrip strength decreased with weight loss over time for both left and right hands.
- On an individual basis, five (45%) subjects increased in average handgrip strength, despite a reduction in weight.
- When the two variables were correlated the relationship between changes in grip strength and weight were not significant.

- Use of the dynamometer is feasible in the clinical setting.
- We find no significant correlation between handgrip strength and weight loss in head and neck cancer patients receiving radiation therapy.
- Further research is needed to establish standardized hand grip strength reference ranges.