Prevention and Management of Sarcopenia: Latest Research Evidence

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Prevention and Management of Sarcopenia: Latest Research Evidence
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Background

Sarcopenia: age-related loss of skeletal muscle mass and strength
- Mass declines 1-2% per year
- Strength declines 3% per year after age 60

Prevalence
- 1-29% community dwelling populations
- 14-33% long-term care residents

Impact
- Functional impairment
- Poor health-related quality of life
- Fall risk
- Premature death

Costs
- CDC reported in 2015, medical costs for falls totaled more than $50 billion
- Average hospital cost for a fall injury is over $30,000

Interventions

Diet
- Beta-Alanine Supplementation

Question: Effects of increased carnosine stores via beta-alanine supplementation and how it effects exercise capacity and executive function

Methods:
- 12 adults (average age=60.5±8.6 yrs.)
- 2.4g/d β-alanine (BA) or Placebo (PL) microcrystalline cellulose for 28 days

Exercise capacity
- Cycle ergometer
- Executive function
- Stroop test (T1-T4)
- Time-to-Exhaustion (TTE)

Underlying Mechanisms:
- Naturally occurring in meat, poultry, fish
- β-alanine + Histidine = Carnosine
- [Carnosine] in muscle tissue
- pH buffer

Diet Results

Exercise

Elastic Resistance Training
  Journal of Exercise Rehabilitation (2018)

Question: Effect of elastic resistance training on glucose homeostasis, strength, and functionality in older adults with sarcopenia

Methods:
- 7 subjects with sarcopenia (age, 70.7±8.0 years)
- 12 weeks elastic RT
- Oral glucose tolerance - Type 2 Diabetes
- Gestational Diabetes
- Handgrip strength
- Sit-to-stand
- 4-m walk

Underlying Mechanisms:
- Exercise benefits those who are insulin resistant and do not have a stable glucose homeostasis
- Insulin allows the body to use glucose for energy via cellular respiration
- Suppresses muscle protein degradation
- Ubiquitin-proteasome pathway: directly involved in protein break-down

Exercise Results

Table 1. Comparison between exercise on handgrip strength and functionality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th>12 Weeks</th>
<th>z</th>
<th>p</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handgrip</td>
<td>20 (15.2)</td>
<td>22 (17.3)</td>
<td>0.83</td>
<td>0.04</td>
<td>0.19</td>
</tr>
<tr>
<td>Stair test (sec)</td>
<td>36.5±6.4</td>
<td>32.3±5.2</td>
<td>1.22</td>
<td>0.001</td>
<td>0.99</td>
</tr>
<tr>
<td>Stair test (m)</td>
<td>10 (3.3)</td>
<td>5 (1.9)</td>
<td>1.13</td>
<td>0.10</td>
<td>0.62</td>
</tr>
<tr>
<td>Qualification test</td>
<td>15 (3.8)</td>
<td>17 (3.4)</td>
<td>0.53</td>
<td>0.23</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Diet and Exercise

Whey Protein & Resistance Training
  The Authors of Geriatrics and Gerontology International (2018)

Question: Effectiveness of nutritional supplementation ingested after resistance exercise on increasing muscle mass and physical function among older Japanese women

Results

Lower limb muscle mass
- P<0.001

Skeletal muscle mass
- P<0.001

Knee extension strength
- P<0.001

Discussion

Earlier adoption to a healthy lifestyle promotes best results regarding sustained muscle mass and strength over time. Those who are diagnosed with sarcopenia, however, may be able to increase muscle mass and strength via consistent exercise regimens and/or protein supplementation that is ingested right after exercise. Increases of muscle mass and strength in those with sarcopenia, primarily the elderly, will lead to decreased falls and injury and improve overall functionality, independence, and quality of life.

Acknowledgements

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