The Older Woman and Sarcopenia
Session 5B Midlife Health And Beyond
EMAS

XII Annual Meeting of the Mediterranean Society for Reproductive Medicine (MSRM) - World Congress on Building Consensus out of Controversies in Obstetrics, Gynecology & Infertility (COGI)

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Hospital San Juan de Dios
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Barcelona, 26 of April 2014
Dr Vincenzo Malafarina

Hospital San Juan de Dios, Pamplona, Spain.

The Older Woman and Sarcopenia

Disclosure of Conflict of Interest

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<td>ABBOTT NUTRITION</td>
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<td>NESTLE HEALTH CARE</td>
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• Definition and Pathophysiology of Sarcopenia
• International Working Groups
• Diagnosis and cut-off points
  – Function; Strength; muscle mass
• Sarcopenia and woman
  – Obesity
  – Osteoporosis
  – Nutritional supplementation
• Conclusions
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Review

Sarcopenia in the elderly: Diagnosis, physiopathology and treatment

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\textsuperscript{b} Servicio de Soportes Estadísticos, Fundació per a la Recerca Sant Joan de Deu, Carrer Santa Rosa 39-57, Level 3, 08950 Esplugues de Llobregat, Barcelona, Spain
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• Reduction of muscle:
  – Function
  – Strength
  – Mass

observed in the elderly.

• The relationship between mass and strength is nonlinear
Pathophysiology of Sarcopenia

- Neuromuscular aging
  - Largest motor units
  - Loss of α motoneurons
- Inflammation and hormonal changes
  - Inflammatory cytokines increase
  - Reduced sex hormones
- Immobility and bed-rest
- Cachexia versus sarcopenia
- Sarcopenia versus dynapenia
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Opinion Paper

Consensus definition of sarcopenia, cachexia and pre-cachexia: Joint document elaborated by Special Interest Groups (SIG) “cachexia-anorexia in chronic wasting diseases” and “nutrition in geriatrics”

M. Muscaritoli a,+, n, S.D. Anker b,+, n, J. Argilés c,+, n, Z. Aversa a,+, n, J.M. Bauer d,o, G. Biolo e,+, n, Y. Boirie f,o, I. Bosaeus g,o, T. Cederholm h,o, P. Costelli i,+, n, K.C. Fearon j,+, n, A. Laviano a,+, n, M. Maggio k,o, F. Rossi Fanelli a,+, n, S.M. Schneider l,o, A. Schols m,n, C.C. Sieber d,o

Roger A. Fielding, PhD (Co-Chair), Bruno Vellas, MD (Co-Chair), William J. Evans, PhD, Shalender Bhasin, MD, John E. Morley, MD, Anne B. Newman, MD, MPH, Gabor Abellan van Kan, MD, Sandrine Andrieu, MD, PhD, Juergen Bauer, MD, Denis Breuille, PhD, Tommy Cederholm, MD, PhD, Julie Chandler, PhD, Capucine De Meynard, MD, Lorenzo Domini, MD, PhD, Tamara Harris, MD, MS, Aimo Kannt, PhD, Florence Keime Guibert, MD, Graziano Onder, MD, PhD, Dimitris Papanicolaou, MD, Yves Rolland, MD, Daniel Rooks, ScD, Cornel Sieber, MD, Elisabeth Souhami, MD, Sjors Verlaan, PhD, and Mauro Zamboni, MD
REPORT

Sarcopenia: European consensus on definition and diagnosis

Report of the European Working Group on Sarcopenia in Older People

Alfonso J. Cruz-Jentoft\(^1\), Jean Pierre Baeyens\(^2\), Jürgen M. Bauer\(^3\), Yves Boirie\(^4\), Tommy Cederholm\(^5\), Francesco Landi\(^6\), Finbarr C. Martin\(^7\), Jean-Pierre Michel\(^8\), Yves Rolland\(^9\), Stéphane M. Schneider\(^10\), Eva Topinková\(^11\), Maurits Vandewoude\(^12\), Mauro Zamboni\(^13\)
EWGSOP-suggested algorithm for sarcopenia

1. Older subject (> 65 years) +
2. Measure gait speed
3. > 0.8 m/s
   - Measure grip strength
     - Normal
     - No sarcopenia
   - Low
     - Sarcopenia
4. ≤ 0.8 m/s
   - Measure muscle mass
     - Low
     - No sarcopenia
     - Normal

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Muscle function

- Walk test 4 m
- Normal > 0.8 m / s
- Prognostic factor †
- Crossing a street with traffic light in green
• Prognostic factor
  – Dynamometer
  – Cost-effectiveness
  – Portable, Easy, Fast, Valid
• Relationship with knee extension strength, PEF
• Grip work = GS x 0.75 x FR
• Woman with lowest knee extension were more likely to present impairment in (fold):
  – 5.9 self-reported activities, 24.7 chair srand, 12.1 usual and 20.9 fast gait speed.

### Fried cut-off

<table>
<thead>
<tr>
<th>Men</th>
<th>Cutoff for grip strength (Kg)</th>
</tr>
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<tbody>
<tr>
<td>BMI ≤ 24</td>
<td>≤29</td>
</tr>
<tr>
<td>BMI 24.1–26</td>
<td>≤30</td>
</tr>
<tr>
<td>BMI 26.1–28</td>
<td>≤30</td>
</tr>
<tr>
<td>BMI &gt; 28</td>
<td>≤32</td>
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<tr>
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<tbody>
<tr>
<td>BMI ≤ 23</td>
<td>≤17</td>
</tr>
<tr>
<td>BMI 23.1–26</td>
<td>≤17.3</td>
</tr>
<tr>
<td>BMI 26.1–29</td>
<td>≤18</td>
</tr>
<tr>
<td>BMI &gt; 29</td>
<td>≤21</td>
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</tbody>
</table>

### Sallinen Cut-off

<table>
<thead>
<tr>
<th>Men</th>
<th>Cutoff for grip strength (Kg)</th>
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<tbody>
<tr>
<td>BMI 20 – 24.9</td>
<td>≤ 33</td>
</tr>
<tr>
<td>BMI 25 – 29</td>
<td>≤ 39</td>
</tr>
<tr>
<td>BMI &gt; 29</td>
<td>≤ 40</td>
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Sallinen J et al. JAGS 2010;58(9):1721-1726.
## Muscle mass

- **DXA**
- **BIA**

<table>
<thead>
<tr>
<th></th>
<th>Baumgartner</th>
<th>Melton</th>
<th>Jessen</th>
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<tbody>
<tr>
<td><strong>Women (Kg/m²)</strong></td>
<td>5.45</td>
<td>6</td>
<td>&lt;5.76</td>
</tr>
<tr>
<td><strong>Men (Kg/m²)</strong></td>
<td>7.26</td>
<td>8.7</td>
<td>&lt;8.51</td>
</tr>
</tbody>
</table>

\[
MM = [(\text{height}^2 / \text{BIA-resistance} \times 0.401) + (\text{sex} \times 3.825) + (\text{age} \times -0.071)] + 5.102
\]

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Sarcopenic obesity

- Not always decrease BMI
  - Reduced muscle mass
  - Increased fat mass
  - > 28% ♂ > 40% ♀

- Adipose tissue: metabolically active

- Obesity paradox: U pattern
  - BMI between 23 and 28 <mortality

- ↑ FM → ↓ walking ability

- ↓ LM → ↓ endurance activities
Specific body compartments have differential response to diet-induced weight loss

- DR+E preserved muscle size
- ↓ SAT and IMAT of calf associated with faster WS

Difficult with physical function

- LMM not associated
- Obese 44-79% higher odds
- LMM+Obese: 2.6 higher odds difficulty climbing

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• In woman LMM
  – Inverse association 25-OH-D
  – Negatively associated with dietary intakes
  – Associated with osteoporosis OR 12.9 (95% CI 3.1-53.5)
  – Suffering a fracture OR 2.7 (95% CI 1.4-5.5)
  – Experiencing falls OR 2.1 (95% CI 1.1-4.1)
• Woman, 70 to 80 year, Tampere (Finland)
• Inclusion: one fall during the previous year
• N 409 community living
• Prevalence of sarcopenia
  – 0.9% EWGSOP
  – 2.7% IWG
  – 36% osteopenia, 0.8% osteoporosis

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Effectiveness of Nutritional Supplementation on Muscle Mass in Treatment of Sarcopenia in Old Age: A Systematic Review

- Main aim: analyze the importance of nutritional treatment of sarcopenia and assess the effects of supplementation on muscle mass and performance.
- Secondary objective: review the types of nutritional supplements used.

Results

Potentially relevant citation:
- PubMed n=168
- Cochrane Library n=20

Bibliography of selected articles:
- N=12

After duplicates removed: n=176

Records screened: 176
- Records excluded: n=152
  - No BIA/DXA: n=58
  - No supplement/no oral: n=84
  - Supplement <8wk: n=1
    - <65 years: n=2
  - Cancer: n=6
  - No RCT: n=1

Full-text articles assessed for eligibility: n=24

Studies included in qualitative synthesis: n=17

Studies included in quantitative synthesis: 0
Kim et al demonstrated a significant increase of leg muscle mass in the group treated with physical exercise and supplementation compared with the group without treatment ($P = .007$).

They also proved an increase of appendicular muscle mass in the same group, although the difference was not significant ($P = 0.26$).

Dillon et al observed similar results.
• The trial by Kim et al showed a significant increase of walking speed in the groups treated with physical exercise, compared with the group with no treatment ($P = .007$).

• Flakoll et al observed a statistically significant improvement ($P = .04$) of handgrip strength in the supplemented group.
• All the papers reviewed refer to sarcopenia but only three included sarcopenic patients.
• In one of them, the criteria of sarcopenia differ from those accepted by international consensus and the other two do not specify the criteria used.
Patients with a BMI higher than 20 kg/m$^2$ were included in 53% of the trials and 30% included patients with a BMI above 27 kg/m$^2$. It is fair to assume that the subjects were well-nourished or presented a relatively low risk of malnutrition.

We believe that supplementing well-nourished people is one of the main shortcomings of the trials, as this could limit the margin of improvement we could expect.
• Physical exercise is probably the most effective treatment for sarcopenia, although its effectiveness is low because only a small percentage of older people do exercise regularly and continuously.

• None has taken into account among their results, the possible impact of treatment on activities of daily living and instrumental activities of daily living.
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EDITORIAL

Valoración y tratamiento nutricional de la sarcopenia

Nutritional assessment and treatment of sarcopenia

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\textsuperscript{a} Departamento de Geriatría, Hospital San Juan de Dios, Pamplona, Navarra, España
\textsuperscript{b} Departamento de Medicina Interna, Hospital San Juan de Dios, Pamplona, Navarra, España
Dependency and disability are two public health problems with a large impact on the quality of life of older people.

There are certain factors which can be modified to reduce their prevalence, such as loss of muscle mass and strength, sarcopenia, and excess fat or obesity.

We have a duty to attempt to manipulate these factors in order to improve the health and well-being of older people.
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