Fall Risk Assessment in Elderly with and without history of falls. Strength Analysis of Lower Limb. A comparative study

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INTRODUCTION

Falls in the elderly are a major public concern in terms of morbidity, mortality and costs to health and social services. With aging there is a decrease of balance, flexibility, range of motion, neuromotor function and muscle mass. Should be checked which people that are in greater risk of falling, in order to maximize the effectiveness of any prevention strategy, this requires knowing the causes and possible risk factors that cause falls. The most important risk factors for falls in the elderly is to highlight the decrease in muscle strength and problems with walking and balance. Decreased muscle strength is extremely common among the elderly and is associated with an increased risk of falls. A good muscle function of the joints of the hip, knee and ankle, is essential, these being key joints in postural control strategies used in an attempt to prevent falls.

OBJECTIVES

The aim of this study was to analyse muscle’s performance parameters of flexor and extensor muscles of the knee and ankle of elderly with and without a history of falls.

RESULTS

- Non-probability, convenience, consisted of 30 elderly volunteers
- WOHF Group: 15 individuals without history of falls
- WHF Group: 15 individuals without history of falls

INCLUSION CRITERIA

- WHF group:
  - Having ≥ 65 years;
  - Have not suffered falls over the past year;
  - Possess a condition affecting the lower limbs and/or the gait;
  - Sign the informed consent.

- WOHF group:
  - Have not suffered falls over the past year;
  - Sign the informed consent.

EXCLUSION CRITERIA

- Products need to perform gait support;
- Possess a condition affecting the lower limbs and/or the gait.

MATERIALS AND METHODS

- Isokinetic dynamometer Biodex System 3® according to BIODEX Multi-Joint System—Pro
- Peak Torque (N.m/kg)
- Ratio flexors/ extensors
- Angular speed 60º/s
- Five replications

<table>
<thead>
<tr>
<th>Movement</th>
<th>WOHF</th>
<th>WHF</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak torque per unit mass (N.m/kg) ankle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dorsiflexion</td>
<td>32,44±10,31</td>
<td>32,44±10,31</td>
<td>0,680</td>
</tr>
<tr>
<td>Planatar</td>
<td>40,04±14,09</td>
<td>40,04±14,09</td>
<td>0,365</td>
</tr>
<tr>
<td>Ratio FlexorsCon/ExtensorsCon % ankle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>98,56±27,87</td>
<td>98,56±27,87</td>
<td>0,443</td>
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<tr>
<td>Peak torque per unit mass (N.m/kg) knee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>69,45±24,28</td>
<td>69,45±24,28</td>
<td>0,606</td>
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<tr>
<td>Extension</td>
<td>111,75±32,33</td>
<td>111,75±32,33</td>
<td>0,606</td>
</tr>
<tr>
<td>Ratio FlexorsCon/ExtensorsCon % knee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>61,86±11,04</td>
<td>61,86±11,04</td>
<td>0,606</td>
</tr>
</tbody>
</table>

CONCLUSION

The group of elderly with history of falls showed lower Peak Torque numbers per unit of mass for the knee and ankle joint comparing with the group without history of falls. In present research also the values of the ratio flexors/extensors were analyzed and weren’t found any differences in the knee and ankle joints. We conclude that although being similar, because no statistically significant differences were found, the strength for dorsiflexion and knee flexion of the dominant leg is lower for the WHF group therefore we believe it will be beneficial to include strengthening exercises for the flexors and extensors muscles of these joints, thereby contributing to the prevention of falls.