Paired Samples Analysis of Isolated Gastrocnemius Contracture in Patients with Foot and Ankle Pathology

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Introduction

• There is an increased interest in the relationship between ankle range of motion (isolated gastrocnemius contracture) and foot or ankle pain

• Prior studies have identified a correlative relationship between foot or ankle pain and ipsilateral isolated gastrocnemius contracture

• However, the temporal relationship between foot or ankle pain and isolated gastrocnemius contracture is not well established

• The purpose of the current study was to investigate the relationship between isolated gastrocnemius contracture and foot or ankle pain in terms of a causal versus casual relation, using a validated, reliable measurement device

Methods

• 32 patients presenting with unilateral foot or ankle pain and no evidence of contralateral pathology on clinical examination were recruited

Study design: 25 lbs of force, 22.5 cm from center of rotation, = 25 Nm moment applied about the ankle

Results

<table>
<thead>
<tr>
<th>Maximal Dorsiflexion Between Groups With Three Techniques</th>
<th>Device (deg)</th>
<th>Goniometer (deg)</th>
<th>Gestalt (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Pain</td>
<td>9.6</td>
<td>4.5</td>
<td>1.4</td>
</tr>
<tr>
<td>B. Contralateral</td>
<td>12.5</td>
<td>6.3</td>
<td>2.2</td>
</tr>
<tr>
<td>C. Control</td>
<td>17.8</td>
<td>6.01</td>
<td>4.73</td>
</tr>
</tbody>
</table>

Paired and Independent Samples t-test Results

<table>
<thead>
<tr>
<th>Paired Samples t-test Results</th>
<th>Device</th>
<th>Goniometer</th>
<th>Gestalt</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-B</td>
<td>p=0.03</td>
<td>p=0.07</td>
<td>p=0.33</td>
</tr>
<tr>
<td>A-C</td>
<td>p&lt;0.001</td>
<td>p=0.17</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>B-C</td>
<td>p=0.002</td>
<td>p=0.64</td>
<td>p=0.002</td>
</tr>
</tbody>
</table>

Conclusions

• This is the first study to date using a paired sample to investigate the relationship between isolated gastrocnemius contracture and foot or ankle pain

• Patients with unilateral foot or ankle pain do not have symmetric ankle range of motion

• Clinically, this study provides evidence that foot or ankle pain is associated with ipsilateral and contralateral loss of range of motion when compared to healthy controls

• Further research is needed to stratify the relationship between isolated gastrocnemius contracture and foot or ankle pain

The authors have no conflicts of interest to disclose.