Hamstring injuries continue to affect active individuals and although inadequate muscle extensibility remains a commonly accepted factor, little is known about the most effective method to improve flexibility. Decreased hamstring flexibility as evidenced by limited range in the passive straight leg raise test (SLR) could be due to altered neurodynamics affecting the sciatic, tibial and common fibular nerves. Altered posterior lower extremity neurodynamics could arguably influence resting muscle length and lead to changes in the perception of stretch or pain. Providing movement or stretching could lead to changes in the neurodynamics and modification of sensation, and help to explain the observed increase in flexibility. Neurodynamic sliding interventions are thought to decrease neural mechanosensitivity and it is possible that the inclusion of these interventions in the management of hamstring flexibility would be beneficial.

To compare the effectiveness of an isolated neurodynamic sciatic sliding technique (Neurodynamic group) versus static stretching (Stretching group) in comparison to a Control group receiving a placebo intervention.

Subjects

- One hundred and twenty subjects (50% female) between the ages of 20 and 45 who exhibited bilateral short hamstring syndrome (SHS).

Baseline sample characteristics

<table>
<thead>
<tr>
<th></th>
<th>Stretching Group</th>
<th>Neurodynamic Group</th>
<th>Control Group</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>20 (50%)</td>
<td>20 (50%)</td>
<td>20 (50%)</td>
<td>1.00a</td>
</tr>
<tr>
<td>Age (years)</td>
<td>33.9 ± 7.4</td>
<td>33.7 ± 7.6</td>
<td>32.7 ± 7.8</td>
<td>0.75b</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>69.8 ± 12.3</td>
<td>68.9 ± 11.9</td>
<td>68.4 ± 10.9</td>
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<tr>
<td>Height (cm)</td>
<td>170.8 ± 7.7</td>
<td>171.4 ± 7.7</td>
<td>170.7 ± 6.4</td>
<td>0.88d</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>23.7 ± 2.6</td>
<td>23.3 ± 2.10</td>
<td>23.3 ± 2.8</td>
<td>0.70e</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± standard deviation.

* Chi-square

A significant interaction was observed between intervention and time for hamstring extensibility, F(2,117) = 313.715, p < .001. There was no difference between the 3 groups at the start, p = .893.

Mean change in range of hip flexion was 9.9° (95% CI: 9.1 – 10.7°) in the Neurodynamic group and 5.5° (95% CI: 5.0 – 6.0°) in the Stretching group. Post hoc analysis demonstrated the Neurodynamic and Stretching groups to be significantly different to the Control group (p < .001); and the Neurodynamic group to be significantly different to the Stretching group (p = .006).

Conclusions

While both interventions resulted in a significant increase in hamstring flexibility, the neurodynamic sliding technique increased hamstring flexibility to a greater degree than static hamstring stretching. Future research should look at longer term results and assess the effect of combining neurodynamic techniques with other interventions.

Take home point:

- Using a neurodynamic sciatic sliding technique will increase hamstring flexibility as measured by the passive SLR to a greater degree than static hamstring stretching in healthy subjects with SHS.

Pre-post mean straight leg raise (SLR) values (°) with 95% Confidence Intervals of hamstring extensibility among the three groups.

Static stretching of the hamstring muscles was performed for 30 seconds, 3 times on each leg for a total stretching time of 180 seconds.

Neurodynamic sciatic slider technique was performed by alternating hip flexion, knee flexion and ankle dorsiflexion with hip extension, knee extension and ankle plantarflexion while the subject’s cervical and thoracic spine where maintained in flexion. Movements were performed for 90 seconds on each leg for a total treatment time of 180 seconds.

Passive mobilization of the intrinsic foot joints with the subject in supine lying. Passive mobilizations were applied for 90 seconds to each foot for a total treatment time of 180 seconds.

Take home point:

- Using a neurodynamic sciatic sliding technique will increase hamstring flexibility as measured by the passive SLR to a greater degree than static hamstring stretching in healthy subjects with SHS.