The Effects of Foam Rolling on Hamstring Flexibility

Amanda Methé, BS, ATS Faculty Mentor: Nicole Chimera, PhD, ATC, CSCS
Athletic Training Department, Daemen College, Amherst NY

INTRODUCTION

- Hamstring strains are one of the most common musculoskeletal injuries.
- Reoccurrence rate of 34%.
- Hamstring strain injury risk increases with a lack of flexibility.
- Self-myofascial release helps to increase range of motion (ROM), which reflects improved flexibility.
- A 3-5° increase in the stand and reach test (improved flexibility) occurred following foam rolling.
- However, the Stand and Reach test incorporates low-back and hamstring flexibility, making it unreliable as an isolated hamstring flexibility measurement.
- Active knee extension test is considered the gold standard for measuring hamstring ROM; therefore, this test may be better for measuring isolated hamstring flexibility.

PURPOSE

- To investigate the acute effects of myofascial release, specifically foam rolling, on knee extension range of motion.

HYPOTHESIS

- We hypothesized that hamstring flexibility would increase following foam rolling as compared to control.

METHODS

- **Research Design:** Randomized Control Pretest Posttest.
- **Independent Variables:** Group and Time.
- **Dependent Variable:** Knee extension range of motion change from pre-test to post-test.
- **Participants:** 36 limbs) Daemen College students/faculty >18 years old free from upper and lower extremity injuries, no neurological conditions, no cardiovascular conditions, and no current experience with foam rolling of the hamstring.

INSTRUMENTATION

- **Active Knee Extension Test (AKET) (Figure 1)**
  - Intrarater reliability of .76-.97.
  - 3 times with 1 minute rest.

**Inclinometer (Figure 2)**

**Foam Roller (Figure 3):**

- A more rigid rolled exerts more pressure than a pliable one.
- Foam rolling protocol: 5 - one minute bouts to the hamstring muscle with 1 minute rest between each bout.

**Table 1: Means and Change Scores**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre Test ± SD</th>
<th>Post Test ± SD</th>
<th>Change ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>56 ± 11.5</td>
<td>60 ± 6.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Experimental</td>
<td>55 ± 11.0</td>
<td>68 ± 8.4</td>
<td>8.4</td>
</tr>
<tr>
<td>p Value</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REFERENCES**

- Greater clinically meaningful changes in ROM in the experimental group following foam rolling (Table 1).
- The changes in the control limb could be due to the cross-over effect.
- Although we waited 10 minutes, the effects of foam rolling on the contralateral limb were seen in the control limb post-foam rolling.
- Control limb increases in ROM were higher than the standard error of measurement for the inclinometer.
- While these results may suggest a clinically meaningful change in ROM, the small sample size is a limitation to this study and may have contributed to the lack of statistical significance.
- Further research needs to be done on foam rolling the hamstring and testing AKET to isolate any hamstring flexibility improvements.
- Further needs to be done on the cross-over effect after foam rolling as the findings of this study may suggest a longer lasting effect.

CONCLUSIONS