

The Acute Effects of Common Physical Therapy Interventions on Passive Hamstring Length: A Blinded Randomized Control Trial

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Introduction

- Hamstring shortening is a common problem associated with multiple musculoskeletal problems including the development of low back pain².
- Static stretching and foam rolling have been shown to improve joint range of motion. Several bouts of dry needling have been shown to improve range of motion, although not significantly different from stretching^{3,4,5}.
- While various myofascial techniques have also been shown to improve range of motion, there are few studies comparing the acute effects of more common techniques¹.
- Hypothesis:
 - Dry needling, stretching, and foam rolling will improve hamstring passive length.

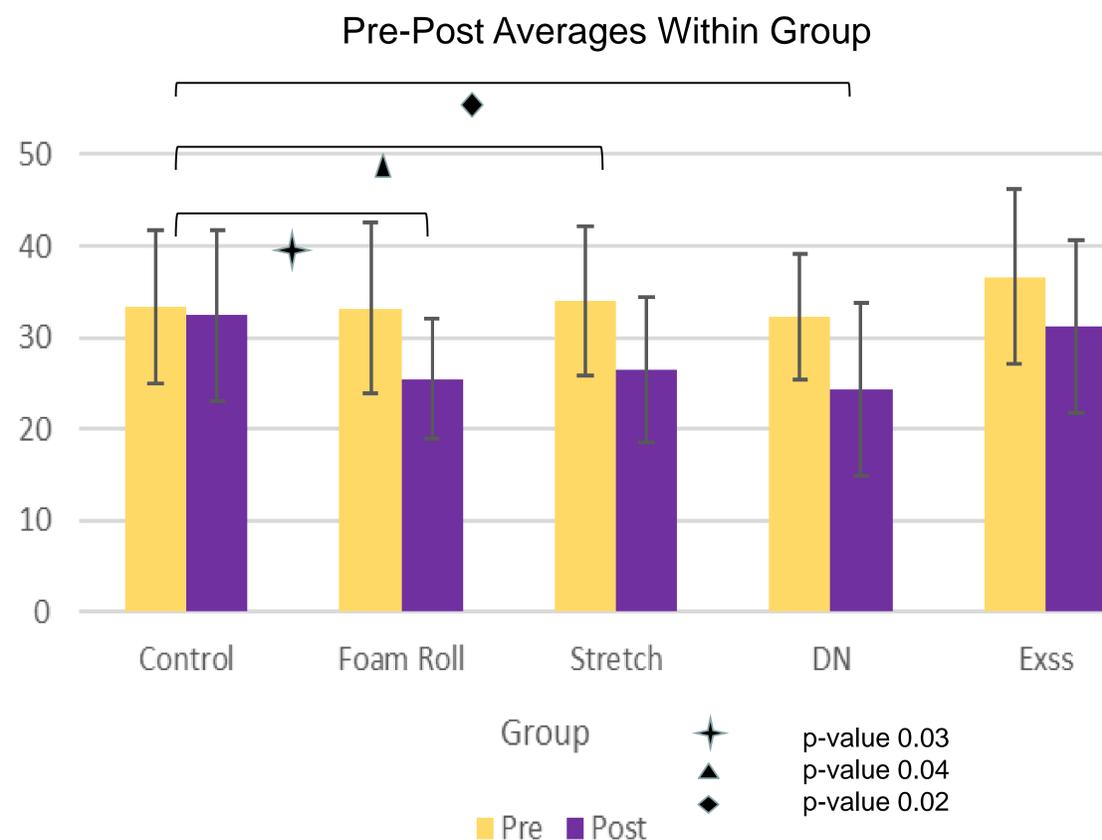


Methods

- Subjects: 100 healthy volunteers ages 18-55 (19 female, 24.8±3.8 yrs).
- Initial right hamstring length measured using "90/90" test and bubble inclinometer.
- Hamstring length was measured by a researcher blinded to the treatment.
- The measurement was taken when the subject perceived a "strong but tolerable stretch".
- Qualifying subjects (hamstring angle >20 degrees) were randomized to one of 5 groups, dry needling (DN), foam rolling, stretching, eccentric exercise, or control.
- Interventions:
 - DN: 3-5 trigger points, pistoning technique
 - Foam Roller: long sit, 6 inch diameter FR, 30 sec roll, 30 sec rest, 3 sets
 - Stretch: 90/90 position, 30 sec stretch, 30 sec rest, 3 sets
 - Exercise: Nordics, 10 repetitions, 30 sec rest, 3 sets
 - Control: Long Sit propped back on hands, 3 minutes
- Post Treatment: hamstring length re-measured using same blinded researcher.

Results & Discussion

- 1-way ANOVA (p-value 0.012) showed that the treatments are not all the same.
- Using Tukey's 'Honest Significant Difference' method for pairwise comparisons, Control vs Foam Roller, vs Dry Needle, and vs Stretch were the only statistically significant pairwise comparisons. These differ by about 6 degrees.
- The results show that Dry Needling is as effective as Stretching and Foam Rolling in improving passive hamstring length.
- Eccentric exercise does not differ significantly from the control group.
- Foam Rolling, Dry Needling, and Stretching were all statistically significant when compared to control and improved passive hamstring length.
- The improvements in hamstring length are acute effects after the intervention, and long-term effects or maintenance of improvement is unknown.
- Further research may look at the long-term effects of Dry Needling vs Stretching vs Foam Rolling vs Exercise to determine if certain interventions may be beneficial in the long-term compared to short-term.



Clinical Relevance

- Dry needling appears to be beneficial for acutely improving mobility, which presents it as an effective alternative for those who may not be able to utilize a foam roller or self-stretching.
- It also suggests that it would not be detrimental to mobility prior to athletic competition.
- Stretching and foam rolling are the same in effectiveness and offer a time-efficient option for individuals who may have pain hypersensitivity.
- Clinicians should consider foam rolling as an alternative to stretching.

References

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