The Use of Instrument Assisted Soft Tissue Mobilization Verse Massage and Proprioceptive Neuromuscular Facilitation Stretching Techniques on Improving Hamstring Flexibility


Context: Instrument assisted soft tissue mobilization (IASTM), massage and proprioceptive neuromuscular facilitation (PNF) stretching are interventions commonly used to address chronic muscle tightness and fascial restrictions. The efficacies of these interventions have not been well established.

Objective: The purpose of this study was to compare the effectiveness of two manual therapy approaches, IASTM and Massage with PNF stretching (MAS/PNF) in improving hamstring muscle tightness and subjective reporting of tightness in physically active individuals.

Design: Single blinded randomized, controlled, repeated-measures design, where group and treated limb were randomized. Setting: University athletic training clinic. Participants: Twenty healthy subjects (8 men, 12 women; mean age, 23.5±7.91 years) with bilateral hamstring tightness (measured using active knee extension (AKE)).

Intervention: Subjects were randomly assigned to one of two treatment groups, IASTM (n=12) and MAS/PNF (n=8). Both treatments consisted of a unilateral 10 minutes treatment to the posterior leg. The subject’s untreated limb was the control. The authors measured pain levels (Visual Analog Scale (VAS)), general disability (Disablement in Physically Active Scale (DPAS), and perceived improvements in muscle tightness (Global Rate of Change (GRC)) at four different times (Pre, Post, 24hrs, 48hrs). A single blinded assessor collected all measurements.

Main Outcome Measures: A repeated measures analysis of variance determined within-subjects factors between AKE and time (Pre, Post, 24hrs, 48hrs), limb (Treated vs. Control), and group (IASTM vs. MAS/PNF). Kruskal-Wallis H test analyzed data collected from the patient reported measures.

Results: The authors found significant main effects between time (F=14.386, P<.001), limb (F=4.717, P=.043) and time-by-limb (F=11.233, P<.000), and AKE measurements. The treated limb of both groups demonstrated significant improvements in AKE compared to control limb. However the time by treatment interaction was not significant, indicating that both treatments groups changed similarly over time (P=.078). There was no difference in mean AKE between the treatment groups over time (F=4.717, P=.714). Significant within-subjects differences in VAS score were revealed for time (F=6.51, P=.000) and for time by group (F=4.46, P=.003). A significant treatment-by-time effect was revealed for the VAS during the treatment (F=10.47, P=.005). The IASTM group reported significantly higher discomfort during the treatment compared to the MAS/PNF group (P=.044). There was no statistically significant difference in the DPAS between the IASTM and MAS/PNF treatments, (post, p=.230; 24 hrs, p=.475; 48 hrs, p=.786). There was also no difference in GRC for perceived muscle tightness between groups over time (post, p=.321; 24 hrs; p=.326; 48 hrs, p=.609).

Conclusion: Both IASTM and MAS/PNF interventions were effective in increasing hamstring flexibility immediately post treatment, which was retained for up to 48 hours. There were no significant differences between the magnitudes of improvement, DPAS, or GRC between the interventions, but those within the IASTIM group reported more discomfort during the treatment.

Word Count: 450