TACSM Abstract

The Acute Effects of Self-Myofascial Release on Range of Motion and Fatigue Rate in the Lower Extremities

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ABSTRACT

There has been a growing popularity in a technique similar to a massage that is easily accessible known as self-myofascial release, or more commonly as “foam rolling”. While research has been conducted to examine the effects on a smooth foam roller, little research has been conducted regarding a more aggressive form of deep tissue self-myofascial release on muscular strength and fatigability. PURPOSE: To examine the acute effect of deep tissue self-myofascial release on hip range of motion and fatigue rate of the quadriceps in uninjured individuals. METHODS: Nineteen males, ages 20-35, with no prior knee surgery/injury on their preferred leg regardless of current functional status were recruited. Subjects were allowed familiarity trials for goniometry of hip flexion/extension, self-myofascial release, and the isokinetic strength/fatigability test prior to exercise testing. All subjects underwent three experimental trials [self-myofascial release (SMR), static stretching (STS), no additional warm-up control (CON)] in a balanced crossover design. During the treatment trials, subjects were required to perform a 10 minute warm-up on a stationary rate independent cycle ergometer (50 W) followed by one of the treatments applied to the hamstrings and quadriceps of the preferred leg; SMR (1 set; 2 min), STS (4 sets; 30 secs). Subjects were required to perform the Thorstensson test, using a single-chair isokinetic dynamometer, which consisted of 50 voluntary maximal isokinetic leg extensions on their preferred leg where the rate of force production was controlled as 180° sec⁻¹. Measurement of hip flexion (HF) and extension (HE), absolute peak quadriceps force production (AF), relative peak quadriceps force production (RF), and perceived local leg fatigue (PF) were recorded. One-way ANOVA with repeated measures was used to analyze for differences between trials (STS, SMR, CON), except for FR where a Friedman ANOVA was used, α=0.05. RESULTS: HF did differ significantly between the treatments (p<0.05) where SMR (113.7±4.8°) and STS (114.7±4.9°) > CON (106.2±5.0°). The treatments also differed significantly (p<0.05) in HE, where SMR (19.7±3.3°) and STS (18.2±4.3°) > CON (13.2±3.6°). AF did not differ significantly (p>0.05) between the treatments (SMR=175.2±32.1 Nm, STS=180.9±35.6 Nm, CON=177.2±38.3 Nm), nor did RF (SMR=1.9±0.4 Nm/kg, STS=1.9±0.4 Nm/kg, CON=1.9±0.4). FR also did not differ (p>0.05) between treatments (SMR=59.7±9.4%, STS=61.3±11.0%, CON=61.5±8.8%). PF was seen to be more frequently greater with most subjects in CON, but there were no significant difference (p>0.05) between trials. CONCLUSION: While SMR had no effect on muscular strength and fatigability, SMR did have similar significant effect as static stretching on hip range of motion.