

Effects of Foam Rolling with Different Application Volumes on the Isometric Force of the Calf Muscle with Consideration of Muscle Activity

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Abstract : Over the past ten years, foam rolling has become a new trend in the fitness and health market. It is also a frequently used technique for self-massage. However, the scope of effects from foam rolling has only recently started to be researched and understood. The focus of this study is to examine the effects of prolonged foam rolling on muscle performance. Isometric muscle force was used as a parameter to determine an improving impact of the myofascial roller in two different application volumes. Besides the maximal muscle force, data were also collected on muscle activation during all tests. Twenty-four (17 females, 7 males) healthy students with an average age of 23.4 ± 2.8 years were recruited. The study followed a cross-over pre-/post design in which the order of conditions was counterbalanced. The subjects performed a one-minute and three-minute foam rolling application set on two separate days. Isometric maximal muscle force of the dominant calf was tested before and after the self-myofascial release application. The statistic software program SPSS 22 was used to analyze the data of the maximal isometric force of the calf muscle by a 2×2 (time of measurement x intervention) analysis of variance with repeated measures. The statistic significance level was set at $p \leq 0.05$. Neither for the main effect of time of measurement ($F(1,23) = .93$, $p = .36$, $f = .20$) nor for the interaction of time of measurement x intervention ($F(1,23) = 1.99$, $p = .17$, $f = 0.29$) significant p-values were found. However, the effect size indicates a mean interaction effect with a tendency of greater pre-post improvements under the three-minute foam rolling condition. Changes in maximal force did not correlate with changes in EMG-activity ($r = .02$, $p = .95$ in the short and $r = -.11$, $p = .65$ in the long rolling condition). Results support findings of previous studies and suggest a positive potential for use of the foam roll as a means for keeping muscle force at least at the same performance level while leading to an increase in flexibility.

Keywords : application volume differences, foam rolling, isometric maximal force, self-myofascial release

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