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ORIGINAL RESEARCH

EFFECT OF DIFFERENT FOAM ROLLING VOLUMES ON KNEE EXTENSION FATIGUE

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ABSTRACT

Background: Foam rolling (FR) is a common intervention utilized for the purpose of acutely increasing range-of-motion without subsequent decreases in performance. FR is characterized as an active technique which subject performs upon themselves. Thus, it is believed that the accumulated fatigue can influence whether the task can be continued.

Purpose: To analyze the effect of different foam rolling volumes on fatigue of the knee extensors.

***Methods*:** Twenty-five recreationally active females (age 27.7 ± 3.56 y, height 168.4 ± 7.1 cm, weight 69.1 ± 10.2 kg) were recruited for the study. The experiment involved three sets of knee extensions with a pre-determined 10 repetition maximum load to concentric failure. Then, subjects performed the control (CONT) and foam rolling (FR) conditions. FR conditions consisted of different anterior thigh rolling volumes (60-, 90-, and 120-seconds) which were performed during the inter-set rest period. After that, the fatigue index was calculated and compared between each experimental condition. Fatigue index indicates how much (%) resistance the subjects experienced, calculated by the equation: (thidset/firstset) x 100.

Results: Fatigue index was statistically significantly greater (greater fatigue resistance) for CONT compared to FR90 ($p = 0.001$) and FR120 ($p = 0.001$). Similarly, higher fatigue resistance was observed for FR60 when compared to FR120 ($p = 0.048$). There were no significant differences between the other conditions ($p > 0.005$).

Conclusion: The finding of foam rolling fatigue index decline (less fatigue resistance) as compared to control conditions may have implications for foam rolling prescription and implementation, in both rehabilitation and athletic populations. For the purposes of maximum repetition performance, foam rolling should not be applied to the agonist muscle group between sets of knee extensions. Moreover, it seems that volumes greater than 90-seconds are detrimental to the ability to continually produce force.

Level of evidence: 2b

Keywords: Massage, neuromuscular fatigue, self-myofascial release, strength

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