

## An Examination of the Effects of Various Procedures to Improve Delayed Onset Muscle Soreness

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### ABSTRACT

Delayed onset muscle soreness (DOMS) is a condition typically accompanied with muscular pain and stiffness. Prior research suggests that applying external pressure to muscle following DOMS may aid in the recovery process. **PURPOSE:** To examine the acute effects of various recovery methods on DOMS. **METHODS:** Following intense DOMS-inducing exercise, nine males (age =  $23.6 \pm 2.4$  years) were exposed to three treatment conditions (foam rolling (FR); body tempering (BT); blood flow restriction (BFR)) or control in a random order. Resting blood pressures were observed and recorded each laboratory visit. Subjects warmed up with a 5-minute treadmill walk at a speed of 3.5 mph at 0% grade and performed three vertical jump (VJ) tests. The DOMS protocol consisted of 5 sets of leg extensions at 85%1RM until failure. Each repetition required a one-second of concentric contraction followed by a four-second of eccentric contraction. Soreness levels were objectively (Force Gage; FG) and subjectively (Likert Scale; LS) measured. Participants received a randomized treatment 24 and 48 hr. after their respective exercise session for a 20-minute period. VJ tests identical to the pretest were executed prior to treatment and 24 and 48 hr. after each treatment. A leg extension endurance test was performed until failure 48 hr. after treatment. **RESULTS:** Significant time main effects ( $p < .05$ ) were indicated for subjective and objective pain perception. VJ values were significantly lower 48 hr. after inducing DOMS compared to the values recorded on the first day ( $p < .05$ ). Our results also demonstrated that FR significantly increased muscular endurance performance when compared to the BFR treatment ( $p < .05$ ) and there was a trend for improved endurance performance for FR compared to control ( $p = .06$ ). Furthermore, a trend for a better endurance performance existed when using BT treatment as opposed to control ( $p = .06$ ). **CONCLUSION:** This study suggests that FR was a more effective treatment method compared to BFR. Prior research suggests that applying external pressure to muscle following DOMS may aid in muscle adhesion separation, promote vasodilation and O<sub>2</sub> delivery, and stimulate mitochondria and energy production due to increased blood volume. Therefore, our findings also indicate that FR and BT may serve as practical modes of treatment for DOMS due to one or a combination of factors such as improved O<sub>2</sub> delivery, increased waste product removal from the muscle, and augmented restoration of the muscles' length-tension relationship.