Benefits of Foam Rolling

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Introduction

Exercise can often induce various degrees of fatigue, discomfort, and muscle damage (1). Exercise-induced muscle damage (EIMD) results in myofibrillar damage and disturbances in the extracellular matrix, sarcomeres, and excitation-contraction coupling (2). Although, a certain degree of EIMD is a normal stimulus for physiological adaptations (3). An excessive degree of EIMD can hinder the performance and training cycle of an individual (3). The reason for this is because EIMD leads to prolonged impairment of muscle function and delayed-onset muscle soreness (DOMS) (1). DOMS is associated with decrease in range of motion (ROM), impaired proprioception, and increased muscle stiffness (2). Thus, several interventional techniques exist to help alleviate these symptoms. Massage, such as foam rolling (FR), is one of the most commonly used techniques for these purposes. FR is an intensive self-treatment with rigid polypropylene rollers aiming to induce myofascial release (4). Myofascial release is a form of manual soft tissue therapy used to treat somatic dysfunction leading to pain and movement limitation (5). During FR, individuals use their own body mass on a foam roller to exert pressure on the soft tissue. Moving over the foam roller places both direct and sweeping pressure on the soft tissue, stretching it and generating friction between it and the foam roller (1). This mechanism, of exerting pressure on the soft tissue, may help release myofibril tension alleviating the unfavorable EIMD effects. The purpose of this article is to evaluate the effects of FR on the detrimental properties of EIMD. Previous researchers have indicated that FR diminishes DOMS, enhances flexibility, improves ROM, and assists in the recovery of muscle strength and joint proprioception. Therefore, FR should be incorporated into training programs to promote recovery and injury prevention.

DELAYED-ONSET MUSCLE SORENESS (DOMS):

Unaccustomed, intensive high-volume exercise typically results in muscle damage and delayed pain, known as DOMS (2). Delayed-onset muscle soreness is classified as a type 1 muscle strain (1). Which usually originates a few hours after the exercise, it reaches its peak 24 to 48 hours later, and may last for several days (2). Often DOMS can produce tenderness or stiffness to palpation or movement, impair joint proprioception, decrease joint range of motion (ROMS), and increase risk of injury (1). It has been shown that FR can reduce the subjective

perceived DOMS by pressure pain threshold and visual analog scale (6). The decrease sensation of DOMS is achieved through the expulsion of water from the fascia by compressing the area and activating the central pain modulatory mechanisms, via neural inhibition (5). Previous researchers have demonstrated that a 20-minute FR session post-exercise significantly decreased the participant's feelings of muscle tenderness and suggest that FR following dynamic movements involving multiple joints may receive greater effects (1, 5)The authors suggest that this result was due to a central modulation mechanism, such as changing the neural excitability of certain regions of the midbrain, and peripheral adaptation, such as changes in the fascia architecture and enhanced blood flow (5; 2). Improved blood flow to the muscle following exercise likely promotes or facilitates oxidative metabolism. Oxidative metabolism buffers pH by using the hydrogen ions to create ATP. There is an increase in oxidative metabolism above resting values following exercise known as EPOC (excess post oxygen consumption). The purpose of EPOC is to return the body back to resting homeostatic values by "paying off the debt" made by relying on anaerobic metabolism. Therefore, the increase blood flow brought on by FR may assist in the removal of hydrogen ions and returning of the muscle to homeostasis which are both helpful.

Flexibility & Range of Motion (ROM):

As discussed previously DOMS can be the result of high intensity or unaccustomed exercise, and is accompanied with many detrimental outcomes such as muscle stiffness and decreased ROM. Generally, it is believed that flexibility is an important component of sport performance and injury prevention (7). Most investigations reveal that FR has the greatest effect on flexibility, which signifies an increase in ROM (5). Therefore, FR has been used in sports settings to increase ROM and decrease muscle stiffness, without decreasing muscle strength and athletic performance, as a component of the warm-up routine (7). These are results of underlying mechanisms, such as neurophysiological (stretch sensation) and morphological (fascial mobility) mechanisms, which are responsible for acute increase in ROM after FR (4).

Muscle Recovery & Joint Proprioceptors:

Errors during position- and force- matching tasks increase postexercise and increase even more after eccentric exercise, a greater contributor to this is impaired joint proprioception (2). Both position-and force- matching tasks contribute to efficient neural control of actions that imply interaction with the environment at different levels: they have a role in reflex responses at

both spinal and cortical levels and are fundamental for the control of all purposeful movements (8). Besides muscular strength, many types of exercise require proper proprioceptive information to control movements and posture. When there is impaired joint proprioception there is an increase of injury for an individual. Limb position and movement are registered by muscle spindles and joint and skin-stretch receptors, and proprioception is indeed substantially reduced during EIMD; this reduction may, in part, be due to the increased stiffness of the muscle or the loss of muscle-receptor input after damage to the intrafusal fibers of the muscle spindles (2). Therefore, different strategies such as FR have been proposed to speed up the recovery from EIMD and maintain proprioceptive function (2). For example, Aynollah Naderi et al. indicated that FR effectively restored muscle and joint position sensing after eccentric exercise (2). Naderi et al. suggested that a possible mechanism for this effect is that FR promotes a faster return to more normal muscle-fiber alignment and, hence, facilitates recovery of muscle function. Hence, increasing muscle recovery and joint proprioceptors by addressing DOMS.

Conclusion:

Based on the findings of the current review, FR following a bout of exercise helps reduce the detrimental effects of EIMD by releasing fluid retention in the muscle fascia and improving blood flow to and from the muscles, which ultimately may lead to reductions in muscle inflammation postexercise. The release of fluid retention with improved blood flow may also assist in the buffering of hydrogen ions in the blood and facilitate a return to homeostatic pH levels. Together, this indicates that FR may decrease the sensation of DOMS and the effects of EIMD by reducing soreness and improving muscle recovery. Additionally, FR may also improve flexibility, ROM and joint proprioception by stretching and enhancing the mobility of the fascia. We recommend the use of FR in both clinical and recreational/professional settings and that 20 minutes of FR post-exercise is enough to observe these beneficial effects.

4 Elements

Apply it:

- FR should be used as a post-exercise recovery protocol in any type of setting to prevent effects of exercise induce muscle damage. .
- FR is very simple; the subject must use their own body mass on a foam roller to exert pressure and do sweeping motions on the soft tissue.

Bridging the Gap:

- Foam Rolling is a form of self-myofascial release used to lessen the negative effects of exercise induced muscle damage . This is achieved by putting pressure, stretching and generating friction on the tissue therefore, releasing fluid retention locally and increasing blood flow. Findings of the current review demonstrate that 20 minutes of foam rolling post-exercise may be sufficient to lessen these negative effects of exercise induced muscle damage.

Summary Statement:

- There is evidence that foam rolling does in fact help lessen the effects of exercise induced muscle damage . This is mainly accomplished by releasing water retention and improving blood flow to and from the muscle.

Pulled Text:

- "Previous researchers have demonstrated that a 20-minute FR session post-exercise significantly decreased the participant's feelings of muscle tenderness and suggest that FR following dynamic movements involving multiple joints may receive greater effects."

Bio:

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