Pre-event Massage for Increased Power Performance

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Sport massage has been used for many years around the world as an aid to enhance performance, recover from muscle soreness and prepare for exercise. While massage is often used as an adjunct therapy, it is most commonly used in post-exercise contexts rather than pre-exercise contexts. Pre-exercise activities, such as warm-up, stretching and massage, can enhance performance and decrease the likelihood of eccentric exercise-induced muscle damage. However, massage has not proven beneficial in a pre-exercise context; little research has been conducted in this area. Therefore, the purpose of this study was to examine the use of massage as an ergogenic aid.

Methods:

Sixteen participants, 9 female and 7 male, were recruited from a pool of University of the Fraser Valley students with a mean age of 20.75 years. The study employed a randomized crossover design using vertical jump as the dependent variable and pre-event massage as the independent variable. Participants performed each trial with no warm up, one trial with and one without a massage. Each participant completed two baseline vertical jumps prior to each condition. Participants jumped down from a 15 cm step (Reebok Step Plate) and were told to land (on Force Plate) and jump up as fast and as high as they could. Counter movement of arms up to the head and lowering of body was allowed. Measures were taken at baseline before treatment, and then at 1, 6, 11 and 16 minutes.

Massage treatment using a non-analgesic lotion included 15 minutes with the following activities:
Prone Position:
- Treatment to lower leg - calf (1.5 minutes per leg, 3 minutes total)
- Treatment to the hips (2 minutes per leg, 4 minutes total)
- Treatment to the hamstrings (2 minutes per leg, 4 minutes total).
Supine Position:
- Treatment to the quadriceps (2 minutes per leg, 4 minutes total).

A force plate (Kistler - Type: 928EA; Bioware 4.1.0.2.) was used to calculate time in the air and vertical jump height. Microsoft Excel was used to calculate 1-tailed t-tests ($p<0.05$), comparing each of minute 1, 6, 11 and 16 minutes to baseline jumps.

Results:

Mean vertical jump heights were 30.4 cm (+/- 7.3 cm) at baseline, and 30.28 cm (+/- 9.1 cm), 31.1 cm (+/- 8.3 cm), 31.3 cm (+/- 8.6 cm), 31.5 (+/- 8.8 cm) at 1, 6, 11 and 16 minutes post massage. Results indicated that the use of massage prior to performance decreased vertical jump height after 1 minute but steadily increased it at 6, 11, and 16 minutes respectively (see Figure 1).

Figure 1: Vertical jump height at baseline, and 1, 6, 11 and 16 minutes post massage.

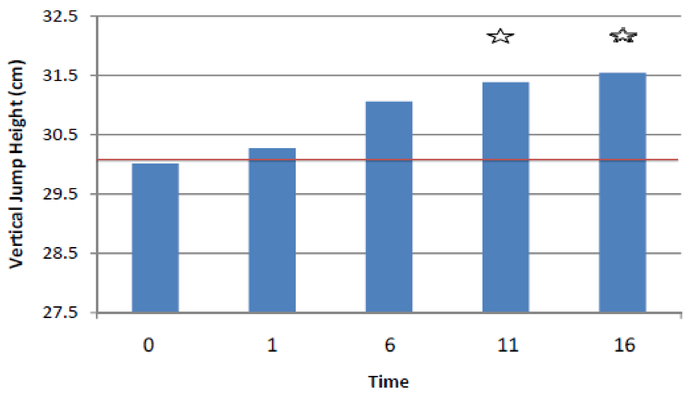
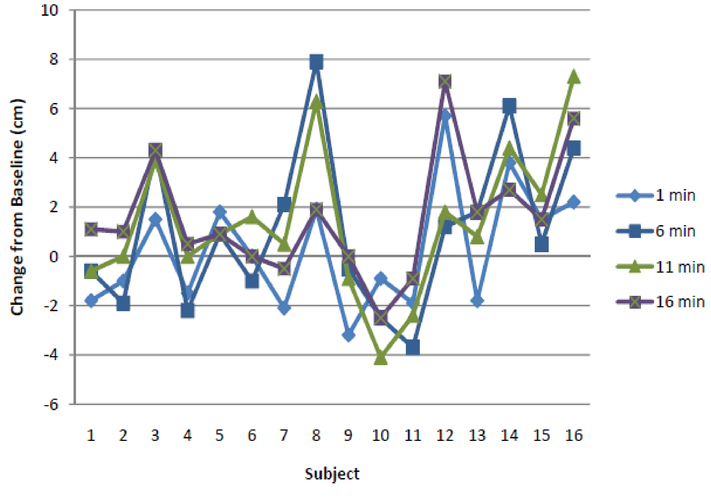


Figure 2: Change in vertical jump height from baseline at 1, 6, 11 and 16 minutes post massage.



Discussion:

It can be concluded that pre-event massage may decrease performance immediately following massage, but may improve performance for a period between 6 and 16 minutes following.

A small, but significant increase in vertical jump height (VJH) of 1 cm was seen at 11 and 16 minutes. While research has been done on the effects of massage on performance, none has been done on the lasting effects. It can be argued that VJH at 1 minute was low because of the massage effects on lowering arousal (central fatigue) and therefore neural recruitment within the muscle. The first VJ was performed one minute following the massage when arousal would be at its lowest point. With 5 minute intervals between jumps, it is possible that the targeted muscles had time to overcome the low arousal and therefore perform better at the 6, 11, and 16 minute mark. While massage has the effects of increased blood flow and increased tissue temperature, reduced neural recruitment negated the positive impacts until after 6 minutes post massage.

These findings are consistent with literature that did not report acute increased VJH following massage treatment. Our present results suggest that a localized targeted massage treatment, while not impacting acute VJH (ie. 1 or 6 min), the benefits of massage become evident after 11 minutes post massage. Present results demonstrate increased VJH in 12 and 13 of 16 participants after 11 and 16 minutes post massage, respectfully.

Conclusion: .

Pre-event massage may inhibit neural drive and spinal reflexes used in jumping for a short period following a massage, but significantly increase performance for a period following. However, more research needs to be conducted on massage localization and duration in order to further see the effects of pre-event massage on performance.