

## 18. Symptoms and Signs

### Reference

Ogai R, Matsumoto T, Kosaka M. Petrissage massage applied during resting period between two successive bouts of intense leg exercise improves performance during second bout. *Nihon Undo Seirigaku Zasshi (Journal of Exercise and Sports Physiology)* 2009; 16(1): 1–7 (in Japanese with English abstract). Ichushi Web ID 2009259007

#### 1. Objectives

To compare petrissage massage applied immediately after the first exercise bout and immediately before the second bout as a means of recovering from fatigue between two successive bouts of exercise.

#### 2. Design

Crossover randomized controlled trial (RCTcross over).

#### 3. Setting

Females from a university physical education department, who exercise regularly, Japan.

#### 4. Participants

Eleven healthy females.

#### 5. Intervention

Arm 1: massage group (immediately after exercise, n=11).

Arm 2: massage group (immediately before exercise, n=11).

Arm 3: control group (resting seated, n=11).

#### 6. Main outcome measures

Mechanical power output, lower-limb fatigue, muscle stiffness.

#### 7. Main results

Mechanical power output increased significantly under Arm 1 and Arm 2 conditions ( $P<0.05$ ). VAS scores increased for lower-limb fatigue with the first exercise bout, but at 15 minutes after massage in Arm 1, it decreased significantly in comparison to other conditions. Muscle stiffness increased after the first exercise bout, but 15 minutes after exercise it decreased significantly in Arm 1 only ( $P<0.05$ ), and at 30 minutes after exercise, it decreased significantly with Arm 1 and Arm 2 in comparison to the control group ( $P<0.05$ ).

#### 8. Conclusions

Petrissage massage improved exercise performance, muscle stiffness, and lower-limb fatigue, but its timing does not affect subsequent exercise performance.

#### 9. Safety assessment in the article

Not mentioned.

#### 10. Abstractor's comments

The material on petrissage massage is detailed and describes the involvement of expert practitioners. Use of a control group (rest) helped confirm that the effects were due to petrissage massage. While objective outcome indicators including blood lactate and muscle stiffness were measured, it appears that changes in muscle stiffness are linked to lower-limb fatigue, yet the changes in blood lactate level are difficult to explain. Some consideration has been given to psychological factors, but there is no data, so no conclusions can be made. If psychological factors are included in a future study, the protocols would need to incorporate objective data, and markers such as psychological parameters (subjective) and stress.

#### 11. Abstractor and date

Tsukayama H, 27 December 2010, 18 March 2011.