

SATURDAY POSTER SESSION

1. SWACSM Abstract

The Effect of Percussive Massage on Skeletal Muscle Mitochondrial Fat Oxidation and Thigh Fat Thickness

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ABSTRACT

Nutrition and exercise are well-established modalities for the induction of fat loss. However, it is important that alternative methods of fat reduction be investigated whether as supplementary treatments to traditional methods or stand-alone interventions, as a significant portion of the population is unable to participate in exercise training or undergo effective diet programs. Some studies have shown that daily whole-body massage can limit body fat deposition in infants, as well as young and middle-aged adults. While most studies have investigated the effects of traditional massage modalities in which massage is applied by a massage therapist using touch to manipulate the soft tissues of the body, research regarding the efficacy of newer massage modalities like percussive massage remains limited. **PURPOSE:** To investigate the effects of percussive massage on skeletal muscle mitochondrial fat metabolism and thigh subcutaneous fat thickness. **METHODS:** Nine healthy young (22 ± 4 yr) men ($n=4$) and women ($n=5$) received 18 sessions of 30-min-percussive massage on their right thigh over the course of 6 weeks. Muscle samples were collected one week before the start of massage sessions and 48 h after the last session from the participant's treated thigh. Subcutaneous fat was imaged and measured using ultrasound on both the treated and contralateral thighs. Mitochondrial fat oxidation was assessed in permeabilized muscle fibers using high-resolution respirometry (Oroboros O2k), supported by octanoylcarnitine (0.5 mM), malate (2 mM), and ADP (2.5 mM). Respiration is expressed as pmol of O_2 consumed per second per mg of tissue (wet weight). **RESULTS** Percussive massage treatment decreased the subcutaneous fat thickness of the treated thigh by $7.2\% \pm 5.4$, which was not significantly higher than the contralateral leg ($0.5\% \pm 4.3$; $p=0.07$). Subcutaneous fat thickness decreased from 10.04 ± 5.49 mm at baseline to 9.36 ± 5.39 mm post treatment in the treated thigh and remained unchanged in the contralateral limb (9.53 ± 5.18 mm to 9.54 ± 5.24 mm). However, maximal mitochondrial fat oxidation increased significantly ($p=0.038$) from 13.16 ± 4.9 pmol O_2 /s/mg to 17.33 ± 3.59 pmol O_2 /s/mg (+31.7%), after 6 weeks of percussive massage. **CONCLUSION:** These results suggest that percussive massage increases mitochondrial fat oxidation, which could potentially lead to a decrease in body fat deposition if applied daily, or over a longer time course.