

# ACUTE SKELETAL MUSCLE HEMODYNAMIC RESPONSE TO PERCUSSIVE MASSAGE TREATMENT



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## BACKGROUND

Percussive massage treatment (PMT) involves mechanical vibration usually applied with a handheld device mechanically similar to a jigsaw. PMT is often implemented as part of a pre-exercise or inter-set routine in efforts to “prime” the muscle for subsequent activity. A warm-up or inter-set rest is in part intended to improve oxygen supply to the muscles involved in the subsequent exercise. However, to our knowledge, the impact of PMT on muscle hemodynamics and oxygenation has yet to be investigated.

## PURPOSE

This exploratory study examined the effects of a single PMT application on lower body muscle hemodynamics and oxygenation as measured by near infrared spectroscopy (NIRS).

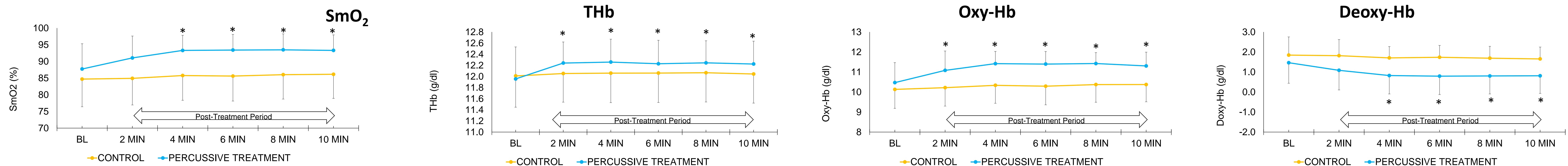
## METHODS

Thirty male and female subjects received a 5-minute PMT application on the quadriceps of their dominant leg after 15 minutes of rest. Skeletal muscle oxygen saturation ( $SmO_2$ ), total hemoglobin (THb), oxy-hemoglobin (Oxy-Hb) and deoxy-hemoglobin (Deoxy-Hb) were measured for 5 minutes prior to and for 10 minutes following the PMT application using NIRS-based muscle oximeters. Concurrent measurements on the contralateral quadriceps were administered serving as the control. Data were analyzed using a two-way ANOVA with significance set at  $p < 0.05$ .



Figure 1:  
Theragun G3Pro

## RESULTS



There was a significant time x treatment interaction for all dependent variables ( $p < 0.0001$ ). PMT resulted in a significant increase in  $SmO_2$  from baseline at the 4-, 6-, 8-, and 10-minute post-treatment time points ( $p < 0.003$ ). There was no change in  $SmO_2$  from baseline for the control. THb and Oxy-Hb was significantly elevated at all post-treatment points vs. baseline ( $p < 0.009$ ) with PMT with no changes detected for the control. Lastly, Deoxy-Hb was significantly lower than baseline at 4-, 6-, 8-, and 10-minute post-treatment time points with PMT while no change was demonstrated for control ( $p < 0.003$ ).

## CONCLUSION

A single PMT application subsequently improved  $SmO_2$  for up to 10 minutes, accompanied by an increase in THb and Oxy-Hb which was disproportionate to the decrease in Deoxy-Hb. These outcomes may be indicative of increased muscle oxygen availability and consumption which could translate to enhanced performance. However, further investigation is necessary to substantiate these potential effects.

Hohenauer, E, Deflorin, C, Clijisen, R. Physiological change after Theragun treatment. THIM 2018

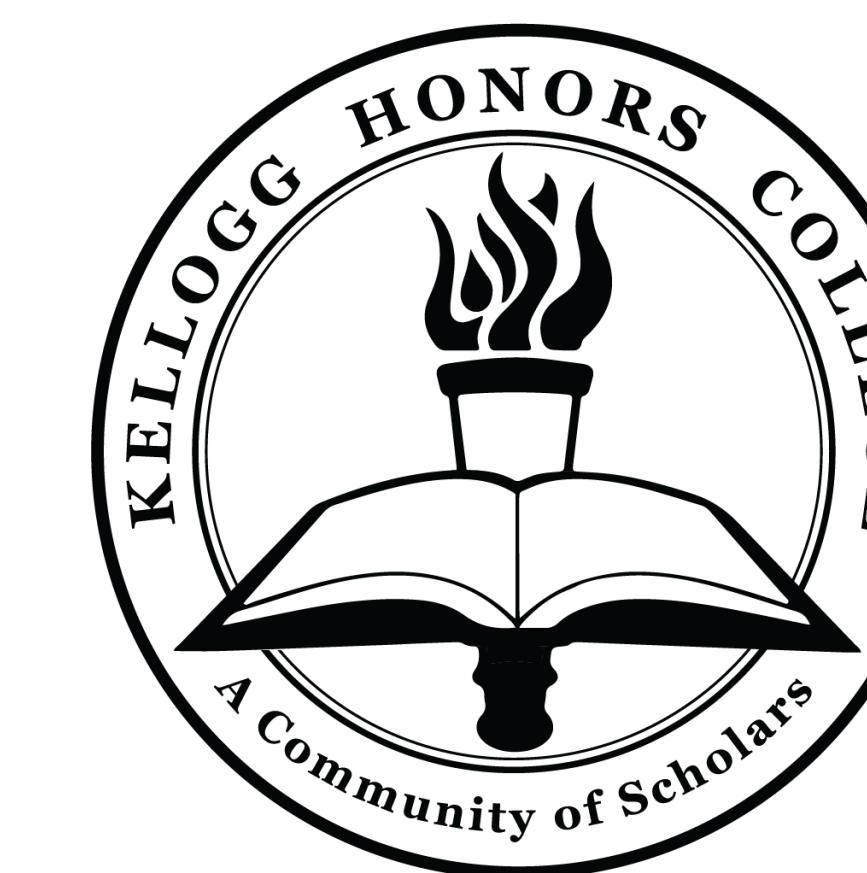


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