

ABSTRACT

THESIS: The effects of whole body vibration and exercise on fibrinolysis in men

STUDENT: Leryn J. Boyle

DEGREE: Master of Science

COLLEGE: Applied Sciences and Technology

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Purpose. The purpose of this study was to examine the fibrinolytic response to whole body vibration (WBV) and exercise in men. **Methods.** Twenty healthy males (23.8 ± 4.2 years, $80.8 \pm 3.3 \text{ kg}\cdot\text{m}^{-2}$) participated in the study. Each subject performed 3 trials in randomized order separated by 1 week. The trials consisted of exercise (X), vibration (V) and vibration + exercise (VX). Exercise sessions consisted of 15 minutes of unloaded squatting at a rate of 20 per minute. Vibration sessions were conducted on a WBV platform vibrating at a frequency of 30 Hz and amplitude of 1.5mm for 15 minutes. Plasma concentrations of active tPA and PAI-1 samples were assessed at baseline and immediately after each session. **Results.** tPA activity change from pre to post trial was found to be significantly greater in the VX condition ($0.87 \pm 0.35 \text{ IU}\cdot\text{ml}^{-1}$ to $3.21 \pm 1.06 \text{ IU}\cdot\text{ml}^{-1}$) compared to the X ($0.71 \pm 0.36 \text{ IU}\cdot\text{ml}^{-1}$ to $2.37 \pm 1.13 \text{ IU}\cdot\text{ml}^{-1}$) or V ($0.83 \pm 0.25 \text{ IU}\cdot\text{ml}^{-1}$ to $1.00 \pm 0.37 \text{ IU}\cdot\text{ml}^{-1}$) condition. tPA activity change from pre to post trial was found to be significantly greater in the X condition compared to the V condition. PAI-1 activity change from pre to post trial was found to be significantly decreased in the VX

($6.54 \pm 5.53 \text{ IU}\cdot\text{ml}^{-1}$ to $4.89 \pm 4.13 \text{ IU}\cdot\text{ml}^{-1}$) and X ($9.76 \pm 8.19 \text{ IU}\cdot\text{ml}^{-1}$ to $7.48 \pm 7.11 \text{ IU}\cdot\text{ml}^{-1}$) conditions compared to the V ($5.68 \pm 3.53 \text{ IU}\cdot\text{ml}^{-1}$ to $5.84 \pm 3.52 \text{ IU}\cdot\text{ml}^{-1}$) condition. Heart rate change from pre to post exercise for the V condition (pre, 75 ± 8 bpm; post, 90 ± 7 bpm) was less than the change in the VX condition (pre, 77 ± 13 bpm; post, 148 ± 19 bpm) and X condition (pre, 71 ± 11 bpm; post, 139 ± 22 bpm). The change in heart rate was found to be similar in the X and VX conditions. Peak RPE was not significantly different between X and VX sessions. **Conclusions.** WBV does not stimulate increased fibrinolytic activity in young men. However, the significant increase in fibrinolytic potential observed during squatting exercise is enhanced by concurrent WBV.

