Eur J Appl Physiol. 2008 Jul;103(4):441-8.

The rate of muscle temperature increase during acute whole-body vibration exercise.

Cochrane DJ, **Stannard SR**, **Sargeant AJ**, **Rittweger J**.

Sport Management and Coaching, Department of Management, Massey University, Private Bag 11 222, Palmerston North, New Zealand. D.Cochrane@massey.ac.nz

This study compared the rate of muscle temperature (Tm) increase during acute whole-body vibration (WBV), to that of stationary cycling and passive warm-up. Additionally we wanted to determine if the purported increase in counter-movement jump and peak power cycling from acute WBV could be explained by changes in muscle temperature. Eight active participants volunteered for the study, which involved a rest period of 30 min to collect baseline measures of muscle, core, skin temperature, heart rate (HR), and thermal leg sensation (TLS), which was followed by three vertical jumps and 5 s maximal cycle performance test. A second rest period of 40 min was enforced followed by the intervention and performance tests. The change in Tm elicited during cycling was matched in the hot bath and WBV interventions. Therefore cycling was performed first, proceeded by, in a random order of hot bath and acute WBV. The rate of Tm was significantly greater ($P < 0.001$) during acute WBV (0.30 degree C min(-1)) compared to cycle (0.15 degree C min(-1)) and hot bath (0.09 degree C min(-1)) however there was no difference between the cycle and hot bath, and the metabolic rate was the same in cycling and WBV (19 mL kg(-1) min(-1)). All three interventions showed a significant ($P < 0.001$) increase in countermovement jump peak power and height. For the 5 s maximal cycle test (MIC) there were no significant differences in peak power between the three interventions. In conclusion, acute WBV elevates Tm more quickly than traditional forms of cycling and passive warm-up. Given that all three warm-up methods yielded the same increase in peak power output, we propose that the main effect is caused by the increase in Tm.

PMID: 18392845 [PubMed - indexed for