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**\*\* SESSION \*\*** Skeletal Muscle Injury/Damage

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**Title:** **Strength Training on Vibrating Plates: Markers of Muscle Damage**

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Whole body vibration (WBV) has been recently suggested as an alternative form of exercise. Many athletes are reported to perform strengthening exercises on vibrating plates with the aim of improving strength and power performance. To date, no study has established whether strength exercises performed on vibrating plates leads to muscle damage.

**PURPOSE:** To evaluate the effects of an acute bout of half-squat exercise with and without the superimposition of whole body vibrations (WBV) on maximal voluntary contraction and markers of muscle damage.

**METHODS:** Eight young healthy individuals (22.5±1.2 yrs; 72.9 ± 15.2kg; 173.5 ± 9.2 cm) performed ten sets of one minute of dynamic half squat exercise (26 squats/minute) with one minute rest between sets and an external load equal to 30% of their body mass. Using a randomised cross over design, volunteers participated in two trials separated by 3 weeks of whole body vibration (WBV (30 Hz; 3.5 g [1g= 9.81m·s<sup>-2</sup>]) and no vibration (Control) on a specially designed plate. Maximal voluntary contraction torque of the knee extensors (MVC) and muscle soreness were measured before, immediately after, 24h, 48h and 5 days after the treatment. Blood samples were collected for Creatine Kinase (CK) analysis pre-exercise, 24h, 48h and 5 days after the exercise bout.

**RESULTS:** A significant decrease in MVC was observed immediately after exercise (-11.8%; P<0.05) in the WBV trial. In contrast there was an improvement from baseline in MVC at day 5 following the intervention (+13.5%; P<0.001) in the control condition. Muscle soreness after WBV exercise was significantly higher in calf (P<0.001) and quadriceps muscles (P<0.05) as compared to control. No significant change was observed in CK activity, however a trend to increase (P = 0.052) was observed 24h after WBV treatment.

**CONCLUSIONS:** A 10min session of dynamic squatting on a vibrating plate was shown to produce an acute reduction in MVC in healthy individuals, which recovered after 5d. The significant increases in muscle soreness and the trend to increase in CK activity seem to suggest that performing strength training exercises on vibrating plates can lead to muscle damage more than performing the same exercises in conventional conditions.