THE EFFECTS OF LOCAL VIBRATION ON TRADITIONAL STRENGTH TRAINING

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The effects of local vibration on traditional strength training
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Introduction: Local vibrations have the advantage that only a part of the body is exposed to the vibration stimulus. Thus stress to the head and brain can be minimized in contrast to whole body vibration. Moreover, muscles can be exposed in different ways to local vibration stimulation, i.e. through the antagonist or the agonist combined or not with additional load. Aim of this investigation was to find out whether local vibrations are a suitable additional stimulus for traditional strength training.

Methods: In 3 different studies a total of 90 sport students, all with strength training experience, trained under three different conditions with and without local vibration (vibration group VG and traditional training group TTG). In the first study (n = 27) the m. biceps brachii was trained with the Scott Curl exercise (4 sets, 12 reps) with progressive additional loading (70 % 1 RM) with (4 mm, 18-36 Hz) and without local vibration stimulus. The second (n = 36) was performed with (4 mm, 18-36 Hz) and without direct stimulation of the hamstrings (4 sets, 12 reps) in combination with progressive loading (70 % 1 RM). The last approach (n = 27) took place without/with local vibration (3 intervals 5 min. long, 4 mm, 20 Hz) on a vibration bicycle ergometer. The training period was 4 weeks long in each study and also included a control group. The tests T1, T2 and T3 consisted of maximal isometric strength and power in the course of 4 weeks for the leg muscles and the m. biceps brachii.

Results: All conditions of local vibration stimulation revealed that there are significantly better results of the VGs in contrast to the TTGs referring to isometric strength and power (between 21-43 % improvement for the VGs in contrast to 14 – 21 % in TTGs). Moreover, generally earlier adaptations within the VGs in the intermediate tests were a typical phenomenon.

Conclusion: The local vibration stimulus seems to be an appropriate training means to improve various strength parameters. Although not directly comparable, the different conditions of local vibration seem to be equally suitable to improve strength parameters. This can be generally explained by the near or direct stimulation of the target muscles. Specifically, better motor unit recruitment as a result of reflex activities and a reduction of inhibitory influences of the antagonist explain the higher force and power output (1). Future investigations should aim at establishing appropriate training intensities and volumes for specific training goals.

References:

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