COMPARATIVE EFFECT OF TWO WHOLE-BODY VIBRATION EXERCISE PROGRAMS ON THE NEUROMUSCULAR FUNCTION AND FITNESS IN YOUNG WOMEN

Raimundo, A. 1,2, Batalha, N.1,2, Tomas-Carus, P.1,2, Leal, A.3,Gusi, N.4
1:UE (Évora, Portugal), 2:CIDESD (Portugal) 3:TUHC (Cáceres, Spain), 4:UE, (Cáceres Spain)

Introduction

Vibratory exercises are increasingly used in sport training and physical rehabilitation. This study aims to determine the comparative effects of two vibratory frequencies on the neuromuscular leg function in healthy young active females.

Methods

Twenty-four women (aged 21.9 ± 2.6 years; weight 59.9 ± 7.1 kg) were random1y assigned into 3 groups of 8 subjects: group 25 Hz (G25), group 30Hz (G30), and control group (CG). All intervention programs consisted of 30 training sessions within a 10-week period.The peak torque at 60º/s in concentric and eccentric actions were measured by an isokinetic dynamometer (Biodex System-3, Biodex Corp., Shirley, NY, USA). Fitness tests such Squat Jump, Counter Movement Jump, Stair-Climbing 10-stairs time, 10-m walking time, were also performed. The effects of the interventions were analysed by an adaptation of Analysis of Covariance adjusted by weight.

Results

Vibratory training at 25Hz induced a significant reduction of peak torque in concentric contraction at the velocity of $60°.sec^{-1}$ and improved the stair-climbing capacity. All other variables remained unchanged in the three groups.

Discussion

The results of the present study suggest that 10-weeks of Whole Body Vibration (WBV) programs improved ballistic strength but not isokinetic strength. Some studies with similar frequencies (between 25 Hz and 40 Hz) reported an improvement on vertical jump after 4 and 8 months (Torvinen et al., 2003 Torvinen et al., 2004). Roelants et al., (2004) showed significant improvements of strength measured by isokinetic dynamometer at low (50º/s) and medium velocities (150º/s) in the knee extensors after 24 weeks at 35-40 Hz. Roelants et al., (2004) experimental subjects, were totally untrained whereas ours were female physically active. However, aquatic training (more isoinertial than vibration) improved in isokinetic dynamometry (Gusi et al., 2006). Therefore, young active women could require longer programs to enhance isokinetic dynamometry and the WBV is a non-specific technology to isokinetic strength.

References

1. Torvinen S, Kannus P, Sievänen H, Järvinen T, Pasanen M, Kontulainen S, Järvinen T, Järvinen M, Oja P, Vuori I. (2002 – A). Med. Sc. Sports Exerc., 34 (9): 1523-8.

2. Torvinen S, Kannus P, Sievänen H, Järvinen T, Pasanen M, Kontulainen S, Nenonen A, Järvinen T, Paakkala T, Järvinen M , Oja P, Vuori I. (2003). J. Bone Miner. Res., 18 (5): 876-884.

3. Roelants M, Delecluse C, Goris M, Verschueren S (2004). Int J Sports Med., 25(1):1-5.

4. Gusi N, Gusi N, Tomas-Carus P, Hakkinen A, Hakkinen K, Ortega-Alonso A. (2006) Arthritis Rheum, 55(1):66-73.