

**BRIEF, LOW-IMPACT, HIGH-INTENSITY OSTEOGENIC LOADING TRAINING WITH OSTEOSTRONG DEVICES WITH ONCE-A-WEEK, 10-MIN EXERCISES FOR AT LEAST 12 MONTHS, IMPROVES BONE MINERAL DENSITY AND TRABECULAR BONE SCORE IN WOMEN WITH OSTEOPOROSIS OF THE LUMBAR SPINE**

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**Introduction:** Osteoporosis is a chronic condition characterized by decreased bone density (BMD) and disrupted microarchitecture (trabecular bone score, TBS), associated with increased bone-fracture risk. Women with menopausal osteoporosis are usually treated with antiresorptive medication. "Osteostrong" is a bone-strengthening system that uses brief (10 min), weekly, low-impact, high-intensity osteogenic loading.

**Aim:** to investigate the effectiveness of Osteostrong in women with osteoporosis of the lumbar spine.

**Methods:** 154 postmenopausal women with osteoporosis of the lumbar spine, followed at the Unit on Clinical and Translational Research in Endocrinology, University of Athens, Greece, were enrolled. They were divided into 2 groups. Group A included 75 women treated with Osteostrong (mean age: 58.8y, 95%CI 56.6-60.9); Group A was subdivided in GA1 that included women, who had no parallel antiresorptive treatment, and GA2, that included women who were treated in parallel with such medication. Group B included 79 women who had no Osteostrong intervention (mean age 61.5y, 95%CI 59.2-63.7). Group B was subdivided in GB1, that included women who received no anti-resorptive treatment, and GB2, that included women who were treated with such medication. All the participants had a complete physical examination, an assessment for exclusion of secondary osteoporosis, and a DXA examination [Horizon W(S/N 300472M)], twice, at the time of inclusion in the trial and 12 months after. Statistical analysis performed using freeware R(4.2.2) and examined during the period of study for significant mean differences in the recorded response variables.

**Results:** Paired Student t-test of BMD and TBS of the lumbar spine before and after Osteostrong intervention showed a significant improvement in both patients not receiving bone antiresorptive medication, and synergistically in those receiving such treatment in parallel. In patients receiving neither Osteostrong nor antiresorptive treatment there was a deterioration of BMD and TBS, while in those receiving medication there was a mild BMD and TBS improvement.

**Conclusions:** The study showed a significant improvement of BMD and TBS in the lumbar spine of women with osteoporosis treated with Osteostrong, regardless of parallel anti-resorptive treatment. Osteogenic loading has a synergistic effect with anti-osteoporotic medication, further improving bone strength and quality, leading to reduced bone-fracture risk.