

JOINT & BACK PAIN



ABSTRACT 4a

BACKGROUND AND OBJECTIVE: Jaw osteonecrosis possibly associated with the administration of bisphosphonates is expected to be treated with a non-pharmacologic approach. This study aimed to determine whether noninvasive, mechanically mediated vibration would inhibit the decline in bone mineral density (BMD) that follows menopause, enhance the BMD of the lumbar and femoral neck, and reduce chronic back pain in postmenopausal women with osteoporosis.

METHODS:

A total of 116 postmenopausal women with osteoporosis participated in this study, and they were divided into groups A (66 patients) and B (50). Group A received vibration treatment (Subjects vertically stand on the vibration platform, with a vibration frequency of 30 Hz, amplitude of 5 mm; they received the treatment five times per week, ten minutes each time and totally for six months), whereas women of group B served as controls without any treatment. L2 - 4 BMD, bilateral femoral neck BMD, and body mass index (BMI) were recorded before the treatment or at the third and sixth months of the treatment respectively. After the ending of the treatment, the change of BMD in each group was compared and analyzed. Chronic back pain was evaluated by visual analogue scale (VAS) at baseline and the third and sixth months of the treatment.


RESULTS:

Of the 116 women, 94 including 51 women from group A ((61.23 +/- 8.20) years) and 43 women from group B ((63.73 +/- 5.45) years), completed the study. There were no significant differences in baseline characteristics including age, BMI, menopausal years, lumbar BMD, femoral neck BMD, and VAS between the two groups. The lumbar BMD of the 51 women in group A increased by 1.3% ($P = 0.034$) after vibration treatment for 3 months and by 4.3% at the sixth month ($P = 0.000$). The lumbar BMD in group B was decreased at the third month, but there was not statistical significance ($P > 0.05$). At the sixth month, it was decreased by 1.9% ($P < 0.05$). The femoral neck BMD of the 51 women in group A was slightly increased after vibration treatment for 3 months, but without statistical significance ($P > 0.05$). At the sixth month, the BMD was increased by 3.2% ($P < 0.05$).

In group B, the BMD was not decreased significantly ($P = 0.185$) at the third month, but decreased significantly at the sixth month (1.7%) ($P < 0.05$) compared with the baseline. **Chronic back pain (VAS) reduced more significantly in group A at the third and the sixth months ($P < 0.05$) after vibration therapy in comparison with the baseline.** The BMI was not significantly changed in the two groups during the period of follow-up.

CONCLUSION:

Vibration therapy appears to be useful in reducing chronic back pain and increasing the femoral neck and lumbar BMD in postmenopausal women with osteoporosis.

 Ruan, X. Y., et al. (2008). "Effects of vibration therapy on bone mineral density in postmenopausal women with osteoporosis." *Chin Med J (Engl)*121(13): 1155-1158.

ABSTRACT 4b

OBJECTIVE: To investigate the effects of squat exercises combined with whole-body vibration on the plasma concentration of inflammatory markers and the functional performance of elderly individuals with knee osteoarthritis (OA).

DESIGN & SETTING:

Clinical, prospective, randomized, single-blinded study. Exercise physiology laboratory.

PARTICIPANTS:

Elderly subjects with knee OA (N=32) were divided into 3 groups: (1) squat exercises on a vibratory platform (platform group, n=11); (2) squat exercises without vibration (squat group, n=10); and (3) the control group (n=11).

INTERVENTIONS:

The structured program of squat exercises in the platform and squat groups was conducted 3 times per week, on alternate days, for 12 weeks.

MAIN OUTCOME MEASURES:

Plasma soluble tumor necrosis factor- α receptors 1 (sTNFR1) and 2 (sTNFR2) were measured using immunoassays (the enzyme-linked immunosorbent assay method). The Western Ontario and McMaster Universities Osteoarthritis Index questionnaire was used to evaluate self-reported physical function, pain, and stiffness. The 6-minute walk test, the Berg Balance Scale, and gait speed were used to evaluate physical function.

RESULTS:

In the platform group, there were significant reductions in the plasma concentrations of the inflammatory markers sTNFR1 and sTNFR2 ($P<.001$ and $P<.05$, respectively) and self-reported pain ($P<.05$) compared with the control group, and there was an increase in balance ($P<.05$) and speed and distance walked ($P<.05$ and $P<.001$, respectively). In addition, the platform group walked faster than the squat group ($P<.01$).

CONCLUSIONS:

The results suggest that whole-body vibration training improves self-perception of pain, balance, gait quality, and inflammatory markers in elderly subjects with knee OA.

 Simão, Adriano P., et al. "Functional performance and inflammatory cytokines after squat exercises and whole-body vibration in elderly individuals with knee osteoarthritis." *Arch Phys Med Rehabil* 93.10 (2012): 1692-1700.