Effect of whole-body vibration exercise on lumbar bone mineral density, bone turnover, and chronic back pain in post-menopausal osteoporotic women treated with alendronate.

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Abstract

BACKGROUND AND AIMS: Exercise may enhance the effect of alendronate on bone mineral density (BMD) and reduce chronic back pain in elderly women with osteoporosis. The aim of this study was to determine whether whole-body vibration exercise would enhance the effect of alendronate on lumbar BMD and bone turnover, and reduce chronic back pain in postmenopausal women with osteoporosis. METHODS: Fifty post-menopausal women with osteoporosis, 55-88 years of age, were randomly divided into two groups of 25 patients each: one taking alendronate (5 mg daily, ALN) and one taking alendronate plus exercise (ALN+EX). Exercise consisted of whole-body vibration using a Galileo machine (Novotec, Pforzheim, Germany), at an intensity of 20 Hz, frequency once a week, and duration of exercise 4 minutes. The study lasted 12 months. Lumbar BMD was measured by dual energy X-ray absorptiometry (Hologic QDR 1500W). Urinary cross-linked N-terminal telopeptides of type I collagen (NTX) and serum alkaline phosphatase (ALP) levels were measured by enzyme-linked immunosorbent assay and standard laboratory techniques, respectively. Chronic back pain was evaluated by face scale score at baseline and every 6 months. RESULTS: There were no significant differences in baseline characteristics, including age, body mass index, years since menopause, lumbar BMD, urinary NTX and serum ALP levels, or face scale score between the two groups. The increase in lumbar BMD and the reduction in urinary NTX and serum ALP levels were similar in the ALN and ALN+EX groups. However, the reduction in chronic back pain was greater in the ALN+EX group than in the ALN group. CONCLUSIONS: The results of this study suggest that whole-body vibration exercise using a Galileo machine appears to be useful in reducing chronic back pain, probably by relaxing the back muscles in post-menopausal osteoporotic women treated with alendronate.

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