

A PILOT STUDY TO DETERMINE DAILY COMPLIANCE OF ELDERLY WOMEN ENROLLED TO STAND ON A LOW-LEVEL VIBRATION PLATFORM SYSTEM TO TREAT OSTEOPOROSIS

M. T. Hannan^{1,2}, C. T. Rubin^{3*}, D. M. Cheng², C. Swift², E. Green², J. Ryaby⁴, D. P. Kiel^{1,2}

¹Harvard Medical School Division on Aging, Boston, MA, USA

²Hebrew Rehabilitation Center for Aged, Research & Training Institute, Boston, MA, USA

³State University of New York, Biomedical Engineering, Stony Brook, NY, USA

⁴Exogen, Inc, Piscataway, NJ, USA

To reduce polypharmacy and medication side effects, non-pharmacologic strategies for the treatment of osteoporosis are ideal for elderly patients. One such potential treatment is the non-invasive delivery of low-level mechanical loading via high-frequency (30 Hz) low-magnitude accelerations (0.3g), an intervention shown to be anabolic in animal studies (1). A randomized, placebo-controlled, double-blinded 6-month pilot study was designed to test compliance for daily use of a 10-minute vibrating platform treatment in elderly female residents of a Continuing Care Retirement Community (CCRC). Compliance was calculated as the number of days attended divided by the trial's 182 days. The primary goal was 80% compliance by all women, and exit assessment of satisfaction with daily use of the device. A secondary aim was to examine the ability of the signal to influence bone quality, as assessed by quantitative ultrasound measures of the right calcaneus (Hologic, Waltham, MA). Of the 24 women enrolled (86 yrs, range 79-92), 21 completed the study, with 93% compliance for daily treatment over 6-months. Including the three women who withdrew from the study, 83% of total subjects had compliance of at least 80% (range 7-100%), with no difference in compliance evident between active vs. placebo treatment. 54% of days missed were for vacation, and 29% for illness. 95% of participants reported overall satisfaction with daily use of the platform, 57% preferred the platform vs. daily oral medications for prevention of bone loss, and 19% had no preference. No subjects complained of discomfort or uneasiness during or following the daily routine. In the short time frame for this study, ultrasound showed no statistical differences in change in bone density ($p > 0.20$) between groups. In conclusion, elderly women living in a CCRC showed high compliance and satisfaction with a daily non-pharmacologic treatment designed to inhibit bone loss. Larger, longer-term trials are required to determine the efficacy of the low-level mechanical stimulus for preventing, or perhaps reversing, osteoporosis in the elderly. 1) Rubin et. al. (2001) *Nature* 412:603-604. Supported by grant from the NIH with equipment provided by Exogen, Inc.