WALKING AND SIMULATED WALKING: EVOLUTION OF FEMORAL BONE DENSITY DURING TIME

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INTRODUCTION

Approximately 2 million women are affected by osteoporosis in Spain. Osteoporosis, or porous bone, is a disease characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and an increased risk of fractures of the hip, spine, and wrist.(1) This pain can impact in the activities of daily living, social relationship and resulting from vertebral fractures (2)(3). This work, compare the effect of walking and simulated walking in two elderly populations.

METHODS

A sample of 194 subjects they were recruited and femur and spine densitometry was made in order to establish whether they had osteopenia or osteoporosis. 126 of the 194 subjects had osteopenia or osteoporosis. Two equivalent groups were matched for osteopenia, osteoporosis, quality of life, age and gender. 50 took part in the experimental group and 27 in the control group. Those in the experimental group attended three weekly sessions of half an hour to a mechanical simulation of walking for 18 months, subjects in the control group continued to lead an active life with habitual physical activities (walking, promenading etc..)(4).Bone density data has been obtained with a Lunar Prodigy C-L9377PC densitometer during periodic times (approximately 3, 6, 12, 15 months).

RESULTS AND DISCUSSION

We analyze femoral bone density average evolution during the 15 month of study long, in both populations of osteoporotic/ osteopenic senior people (Table I). No significative changes have been observed. Both maintain static values of femoral bone density.

If we look the evolution of bone density differences in comparison with expected evolution of osteoporosis in sedentary populations (Figure 1), very low decreases of bone density are observed far away of normal disease evolution.

Both populations seems to have the same evolution to real or simulated walking, with only differences in the response time, faster in the case of simulated walking.

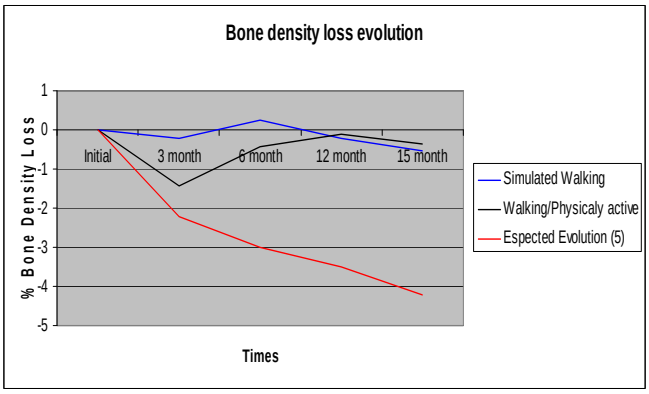

Figure 1: Evolution of bone density loss in both populations.

CONCLUSIONS

Both populations have a similar evolution with time during the study. None differences in bone density evolution have been observed, in fact the walking or the simulated walking has the same effect on femoral bone density. No changes in average bone density have been observed in both populations indicating that osteoporosis has been stopped during study time (15 months) due to real or simulated walk.

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Table 1: Bone density average evolution on times of both osteoporotic/osteopenic elder populations..

Simulated Walking

Times	Initial	3 month	6 month	12 month	15 month
Average	0,85	0,85	0,86	0,85	0,85
SD	0,10	0,09	0,09	0,09	0,09

Walking/Physically active

Times	Initial	3 month	6 month	12 month	15 month
Average	0,88	0,87	0,88	0,88	0,88
SD	0,10	0,09	0,09	0,09	0,09