

ICCN Poster Presentations

Clinical nutrition: diagnosis and management

Efficacy of calcium supplementation and weight-bearing exercise in reducing rate of bone loss in postmenopausal Chinese women – a two-year randomized controlled trial

Y Mun Chan^{1*}, Y Zaitun¹, A Rahman Suriah², S Swee Chee³, S Pheng Chan⁴, M Kandiah¹ and L Fun Lee⁵

¹*Dept of Nutrition & Health Sciences, Faculty of Medicine & Health Sciences, University Putra of Malaysia*

²*Program of Food Science, School of Chemical Science and Food Technology, Faculty of Science and Technology, National University of Malaysia*

³*Dept of Nutrition and Dietetics, Faculty of Allied Health Sciences, University Kebangsaan Malaysia*

⁴*Department of Medicine, Faculty of Medicine, University Malaya*

⁵*Dietetics Unit, University Malaya Medical Centre*

Calcium intake and physical activity are recognized as two modifiable determinants of bone mineral density (BMD). The objective of this randomized controlled trial was to evaluate the efficacy of calcium supplementation and weight-bearing exercise in reducing rate of bone loss in postmenopausal Chinese women who were not on hormone replacement therapy. We randomly assigned 205 postmenopausal Chinese women (mean age, 59 ± 3 years) to control (n=100), calcium (1200 mg calcium carbonate, n=70) or calcium-exercise group (4 hours of brisk walking per week in addition to 1200 mg calcium carbonate) for 24 months. BMD was the main outcome and was measured at baseline and subsequently every six months for two years using dual-energy X-ray absorptionmetry (DEXA). The one-way within subjects ANOVA analysis indicated the control group experienced significant bone loss at all the skeletal sites ($p < 0.05$). There was no significant bone loss for either the calcium or calcium-exercise group. Using ANOVA repeated measures, the percentage of bone loss in the control group was significantly higher when compared to the calcium or calcium-exercise group, at the total body (control -0.77%, calcium -0.14%, calcium-exercise +0.37%; $p < 0.05$), lumbar spine L2-L4 (control -0.74%, calcium 0.34%, calcium-exercise +0.69%; $p < 0.05$), femoral neck (control -1.24%, calcium +0.90%, calcium-exercise +2.62%; $p < 0.05$) and total hip (control -2.21%, calcium -0.26%, calcium-exercise +2.24%; $p < 0.05$). The mean percentage change in BMD in the calcium-exercise group was significantly different from the calcium group at the femoral neck and total hip but not at the total body or lumbar spine L2-L4. The average daily duration of exercise was positively correlated with the changes in BMD at the femoral neck ($r = 0.83$, $p < 0.001$). In conclusion, adequate calcium intake and regular moderate exercise were effective in reducing rate of bone loss in postmenopausal women. A follow-up study should however be formulated to delineate whether the positive effect observed in the calcium and calcium-exercise group persists in a longer duration of study.