

Some Factors Affecting Bone Mineral Status of Premenopausal Women

Se In Oh* · Hyeon-Ju Bae

Dept. of food and nutrition, Seoil College, Seoil College lecturer, Seoul 131-702, Korea*

This study was conducted to investigate dietary and other factors affecting bone mineral density (BMD) in Korean premenopausal women. Seventy-eight premenopausal women who visited health promotion center for health examinations volunteered to participate in this study and they were divided into two groups according to the bone status by T-score : normal or osteopenic group and osteoporotic group. The demographic and general characteristics, and dietary intake were surveyed using the questionnaire. BMDs of the lumbar spine and femoral neck of subjects were measured by dual energy X-ray absorptiometry. Serum samples were measured for Lipid concentration, and calcium, phosphorus, alkaline phosphatase as bone formation indicators. Urine was analysed for creatinine as bone resorption indicators. The results are as follows: The mean BMDs of the lumbar spine and femoral neck were $1.21 \pm 0.02 \text{g/cm}^2$ and $0.97 \pm 0.04 \text{g/cm}^2$, respectively and the BMD levels of osteoporotic group were significantly lower than that of normal or osteopenic group ($p < 0.001$, respectively). Height in osteoporotic group was significantly lower than that of normal or osteopenic group ($p < 0.01$), and bodyweight did not show any significant difference but had a lower tendency. Mean daily intake of energy was $1720 \pm 52 \text{kcal}$. When nutrient intake was compared with recommended dietary allowances (RDA) of subjects, calcium, Fe, vitamin A and riboflavin intakes showed means lower than RDA. The nutrient intake did not show any significant difference between normal or osteopenic group and osteoporotic group except intakes of protein, fat and niacin. Serum and urine levels did not show any significant differences between normal or osteopenic group and osteoporotic group and all were within normal range, however, serum alkaline phosphatase level of osteoporotic group was significantly higher than that of normal or osteopenic group ($p < 0.001$). Height showed positive correlations with lumbar spine bone mineral density (LBMD, $r = 0.332$, $p < 0.01$), no correlation was found with femoral neck bone mineral density (NBMD). Age, age at menarche, bodyweight, body mass index (BMI) and obesity showed no correlation with BMD. The BMD of the lumbar spine was significantly and positively related to the intake of niacin and vitamin C ($r = 0.236$, $p < 0.05$; $r = 0.274$, $p < 0.05$). Serum levels of calcium and phosphorus showed a negative correlation with LBMD ($r = -0.698$, $p = 0.0001$; $r = -0.503$, $p = 0.0001$, respectively).

The results suggested that the BMDs of the lumbar spine was positively related to the intake of niacin and vitamin C in premenopausal women. Therefore, this study confirmed that one of the most effective way to minimize bone loss would be higher intake of niacin and vitamin C rich foods and habitual physical activity may have a beneficial effect on BMD in premenopausal period.