EAM Program completes study of influence of lifestyle on bone density

Researchers from the Ethel Austin Martin Human Nutrition Program recently completed an analysis that looked at the influence of lifestyle on bone density. They performed the analysis using data collected during the first visit of the South Dakota Rural Bone Health Study (SDBHRS).

Hypothesis
The hypothesis was that Hutterite and rural populations would have greater bone mass than non-rural populations, and that the differences could be explained by differences in activity levels. Increased bone mass, size, and geometry, the researchers believed, result from differences in muscle strength and activity among the three populations.

Who Was Involved?
The study involved examining 1,189 people aged 20 to 66 years enrolled in the South Dakota Rural Bone Health Study. Those people included 504 Hutterites (188 men), 349 rural individuals (184 men), and 336 non-rural individuals (134 men). Rural individuals were defined as those who have spent more than 75 percent of their lives on working farms or ranches. Non-rural individuals were defined as those who had never lived on a working farm or ranch.

What the EAM Program Found
The study results showed that rural women had greater activity levels than Hutterite and non-rural women, while both Hutterite and rural men had greater activity levels than non-rural men. Researchers also found that Hutterites had the greatest BMC and bone size and that the non-rural population had the lowest BMC and bone size. Rural population results were between those of the other two populations. Both Hutterite and rural men and women had greater bone strength than the non-rural population. Grip strength explained differences in bone strength among the women who were studied, but not among the men. Other lifestyle differences measured at the initial visit did not explain population differences in BMC, aBMD, or bone area.

The results of this study are being published in the scientific journal Bone. Whether or not these results persist when including all of the information...
Whole diets and osteoporosis

Two recent studies highlight the importance of complete diets in preventing osteoporosis. They also acknowledge the role that calcium and vitamin D supplements play in preventing the disease.

One study aimed to determine calcium’s effect on bone loss rates. 200 post-menopausal Chinese women with no history of bone disease and who did not take calcium supplements or drink more than two glasses of milk per day drank 50 mg of powdered skim milk mixed with 400 ml of water (containing 1,200 mg of calcium) daily for 24 months along with their normal diets. The remaining women consumed their usual diets.

The women who drank milk had significantly higher bone density and serum vitamin D levels, and lower bone loss rates than the other women.

Another study determined whether calcium and vitamin D work better in treating osteoporosis in undernourished women when consumed with a general nutritional supplement. Seventy one underweight women age 70 or older received 1,000 mg of calcium and 800 IU of vitamin D per day. Another group also received one or two cartons of a commercial supplement containing 300 kcal of energy and 12 gm of protein.

The group receiving the supplement had greater increases in both lean and fat mass than the other group. However, there were no differences in bone density between groups. The subjects who maintained or gained weight “had significantly better bone density outcomes than those who lost weight.”

The researchers suggested that both vitamin D and calcium can modestly raise bone density and prevent fractures. They also suggest that whole diets and food-based approaches are important because bone health involves complex nutrient interactions. Food tends to cause fewer imbalances than supplements do.

Source: Arbor Clinical Nutrition Updates, Issue 186

SDRBHS Update

As of September 1, 2004, 1,270 individuals (730 women) are participating in the South Dakota Rural Bone Health Study. 535 of those individuals are Hutterites, 350 are non-Hutterites who live a rural (farming or ranching) lifestyle, and 337 are non-Hutterites who do not farm. Those people have provided roughly 12,000 quarterly diet and activity records that we have entered into the nutrient databases and used to calculate intakes.

We have conducted 18-month follow-up visits on nearly all of the participants, and expect to find that the peak bone density achieved early in life is greater in Hutterite and rural study participants than in non-rural participants. We expect higher physical activity levels to produce such an outcome. The finding would explain why some studies have found that people who live in rural areas have a lower number of bone fractures than people who live in cities. We also expect to see population differences in the rates of bone loss.

As we collect data that address such issues, we also aim to discover how other lifestyle factors affect bone health. You can read about these findings in this newsletter and in upcoming issues.

Visit our website at http://www3.sdstate.edu/academics/ethelaustinmartinprogram/index.cfm