

## **CALCIUM, EXERCISE, VITAMIN D AFFECT BONE HEALTH IN GIRLS**

**Calcium supplementation in girls, even before puberty, may help prevent later osteoporosis, perhaps in part by bringing on earlier menstruation, according to a study presented at the IOF World Congress on Osteoporosis. Exercise and vitamin D intake during this period of life are also critical for building bone mass that will survive into old age.**

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Researchers raised the startling possibility that calcium supplementation in prepubertal girls could hasten the arrival of the first menstrual period, according to results presented at the IOF World Congress on Osteoporosis in Rio de Janeiro, Brazil. A possible benefit is that girls who begin menstruation earlier will build a higher 'peak' bone mass by young adulthood, possibly protecting themselves against osteoporosis later in life.

In a separate presentation, researchers from Finland reported that regular athletic activity and high levels of vitamin D during puberty help the skeleton build more bone mass.

### **Calcium intake before puberty improves bone density but may impact age of menarche**

"Peak bone mass, which helps determine osteoporosis risk, is influenced by genetic, hormonal, and environmental factors," said presenter Dr. Thierry Chevalley of the University of Geneva in Switzerland (conference abstract OC27). "Nutrition, especially calcium and protein, and physical activity, are important determinants of osteoporosis risk."

For almost a decade, Chevalley and his colleagues have been following bone development in a group of 144 Swiss girls who were given either calcium supplements or a placebo for a year at the age of eight. The goal of the research is to understand whether bone mass gained as a result of this supplementation will raise the 'peak' bone mass that is reached in young adulthood.

In his presentation, Chevalley gave an update on the girls in their mid-teens. It was found that the earlier girls underwent menarche, the more bone mass they had accumulated by age 16.5. "This is consistent with earlier data showing that late menarche and low calcium intake during childhood are risk factors for developing osteoporosis," said Chevalley.

The researchers also found that the 67 girls remaining in the study who had received calcium supplementation at age eight had experienced earlier menarche (i.e., their first menstrual period) than the 58 girls remaining in the placebo group. Menarche occurred, on average, six months earlier in the calcium-supplemented group.

Chevalley says it is premature to conclude that the early calcium supplementation and menarche will provide these girls with higher peak bone mass in adulthood.

"We need to follow this cohort until they attain their full peak bone mass," he said. "But the current findings should encourage further research about the interaction between nutrition and endocrine factors on bone mass acquisition from puberty to the end of the growth period."

## **Young athletes build more bone mass**

In the same oral session, Dr. Marjo Lehtonen-Veromaa of the University of Turku in Finland reported that girls who engage regularly in athletics build more bone mass than nonathletic girls (conference abstract OC25).

Lehtonen-Veromaa and her colleagues measured skeletal development in girls aged 9 to 15, comparing 120 athletes (gymnasts and runners) with 51 nonathletes. Over the course of the three-year study, the athletes gained significantly more bone mass. "The effect of physical activity was most evident in the hip, where the athletes gained 41 percent more bone mass," said Lehtonen-Veromaa.

The researchers also found that that reduced vitamin D levels were associated with lower levels of bone mineral density in portions of the spine. (See also a separate IOF press release on vitamin D in building healthy bones, particularly results showing serious vitamin D deficiencies in Northern European adolescents [OC8].)

"Children should be encouraged to participate in sports by their parents and teachers," said Lehtonen-Veromaa. "At the policy level, our results suggest that physical education in schools should include about one hour of high-impact load-bearing exercise per day."

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*The International Osteoporosis Foundation (IOF) is a worldwide organization dedicated to the fight against osteoporosis. It brings together scientists, physicians, patient societies and corporate partners. Working with its 165 member societies in 85 locations, and other healthcare-related organizations around the world, IOF encourages awareness and prevention, early detection and improved treatment of osteoporosis.*

*Osteoporosis, in which the bones become porous and break easily, is one of the world's most common and debilitating diseases. The result: pain, loss of movement, inability to perform daily chores, and in many cases, death. One out of three women over 50 will experience osteoporotic fractures, as will one out of eight men<sup>(1)</sup>. Unfortunately, screening for people at risk is far from being a standard practice. Osteoporosis can, to a certain extent, be prevented, it can be easily diagnosed and effective treatments are available.*

<sup>1</sup> Melton U, Chrischilles EA, Cooper C et al. How many women have osteoporosis? Journal of Bone Mineral Research, 1992; 7:1005-10



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