

# Pregnancy, Breastfeeding May Affect Bone Health

BY DOUG BRUNK

SAN DIEGO — The combination of breastfeeding and delaying pregnancy until a woman has acquired the majority of her bone mass appears to have a protective effect on bones, according to study involving more than 600 women.

“Several studies have shown that people who have had many pregnancies have less bone loss than women with no pregnancies,” lead author Dr. Peter F. Schnatz said in an interview.

“Our study is the first to our knowledge looking at the effect of pregnancy during the time of peak bone mineral acquisition and its eventual and ultimate effect on the development of postmenopausal osteoporosis. Most prior adolescent pregnancy studies, for instance, are limited to the immediate postpartum period,” he said at a poster session at the annual meeting of the North American Menopause Society.

Dr. Schnatz, associate chairman and residency program director in the department of obstetrics and gynecology at Reading (Pa.) Hospital and Medical Center and his associates analyzed data from 619 women over 49 years old. They assessed risk factors for osteoporosis, in-



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DR. SCHNATZ

cluding a previous atraumatic fracture of the hip or spine, pregnancy information, and dual-energy x-ray absorptiometry results. They defined osteoporosis as a T score of  $-2.5$  or lower at the lumbar spine,

the femoral neck, or the total femur.

The mean age of the study participants was 62 years and 50% were either current or past smokers. Slightly more than one-quarter (27%) were using or had used a bisphosphonate, 64% were using or had used hormonal therapy, and 5% had used steroids.

Women with any breastfeeding had a significantly lower prevalence of osteoporosis (8%) than women who did not breastfeed (19%), a surprising finding. “It would seem that breastfeeding, which requires acquisition of calcium from the mother to nourish the baby, would cause bone loss,” Dr. Schnatz said.

Among the women who breastfed, those younger than age 27 years at their first pregnancy had a significantly higher prevalence of osteoporosis compared with those who were 27 years of age and older at their first pregnancy (11% vs. 5%, respectively), he reported.

Of the women who were at least 27 years old at first pregnancy, there was a significantly increased prevalence of osteoporosis in those who did not breastfeed, compared with those who did (25% vs. 5%, respectively).

Women who were at least 27 years old at their first pregnancy and who breastfed had a statistically lower prevalence of osteoporosis, compared with their counterparts who had their first pregnancy younger than age 27 and no history of breastfeeding (5% vs. 16%, respectively).

Among women who did not breastfeed, there was little difference in the risk of postmenopausal osteoporosis if the first pregnancy occurred at or after age 22 or 27 years, Dr. Schnatz wrote.

The study was supported by an unrestricted grant from the Alliance for Better Bone Health. Dr. Schnatz and his associates had no other financial conflicts to disclose. ■

## Menopausal Status May Modify Inflammation/BMD Association

BY KERRI WACHTER

DENVER — Menopausal status appears to modify the relationship between inflammation and bone mineral density, on the basis of findings from the Framingham Osteoporosis Study.

Postmenopausal women on estrogen replacement therapy (ERT) with higher levels of C-reactive protein—a measure of systemic inflammation—had greater bone mineral density (BMD) at the femoral neck than did those in the same group with lower CRP levels, Dr. Robert R. McLean and his coinvestigators reported in a poster presented at the annual meeting of the American Society for Bone and Mineral Research. In premenopausal women, increased CRP levels were associated with a decrease in BMD at the trochanter.

The Framingham Heart Study Offspring Cohort enrolled 5,124 children and spouses of the original Framingham cohort. From 1996 to 2001, BMD was measured in 3,035 offspring in the Framingham Osteoporosis Study, with fasting blood samples collected from 2,095 of them during 1998-2001. C-reactive protein levels were measured after BMD in 72% of participants, with a median time between assessments of 1.4 years.

BMD was measured at the right femoral neck and trochanter, and at the lumbar spine. Other variables obtained at the time of BMD measurement included age, height, weight, physical activity, smoking status, and use of NSAIDs. In women, menopause status, current ERT use, and years since menopause were also recorded. Separate analyses were performed for the 1,291 men, 229 premenopausal women, 497 postmenopausal women using ERT, and 888 postmenopausal women not using

ERT. Analyses were adjusted for age, height, weight, physical activity, and smoking status.

Median CRP levels were higher for postmenopausal women (3.9 mg/L for those on ERT and 2.3 mg/L for those not on ERT) than for men (1.9 mg/L) or for premenopausal women (1.4 mg/L). In all, 74% of men, 62% of premenopausal women, 86% of postmenopausal women on ERT, and 77% of postmenopausal women not on ERT had CRP levels of at least 1 mg/L.

CRP level was not associated with BMD in men or in postmenopausal women using ERT. However, in those women, there was a significant association between years since menopause and BMD at all three sites. The researchers repeated the analysis for women fewer than 10 years past menopause and those at least 10 years past menopause. “The association of CRP with femoral neck BMD tended to be negative for those less than 10 years past menopause and positive for those at least 10 years past menopause, while there was no significant association at the trochanter or lumbar spine,” they wrote.

For postmenopausal women not using ERT, those with CRP levels of at least 1 mg/L had 2.5% greater BMD at the femoral neck, compared with the lower CRP level group, a significant difference. However, there were no significant associations at the trochanter or lumbar spine. “Contrary to our hypothesis, greater inflammation may be associated with higher BMD among postmenopausal women not using ERT,” wrote Dr. McLean of the Institute for Aging Research, a research affiliate of Harvard Medical School, Boston.

Dr. McLean reported that he has no relevant financial relationships. ■

## FRAX 10-Year Hip Fracture Predictions Match Incidence

BY KERRI WACHTER

DENVER — The FRAX 10-year fracture risk tool was fairly accurate in predicting the observed number of hip fractures that occurred among more than 5,000 participants of the Framingham Heart Study, according to data presented as a poster at the annual meeting of the American Society for Bone and Mineral Research.

The 10-year observed incidence of hip fracture for women was 117 cases, which did not differ significantly from the FRAX predicted number of 113. For men, the observed incidence was 29 cases, also not significantly different from the FRAX predicted number of 38, reported Elizabeth J. Samelson, Ph.D., a researcher at the Institute for Aging Research in Boston, and her coinvestigators.

FRAX is an online tool to calculate the 10-year probability of hip fracture and major osteoporotic fracture in women and men aged 40-90 years, on the basis of bone mineral density (BMD), gender, age, smoking status, glucocorticoid use, height and weight, diagnosis of rheumatoid arthritis or secondary osteoporosis, history of fracture, and parental history of fracture. FRAX was developed by the World Health Organization and was derived and validated using several population-based cohorts.

This study included 5,204 Framingham cohort members (2,917 women and 2,287 men) who had a baseline examination between 1987 and 2001 and were followed for hip fracture over 10 years. All were white.

At baseline, patients were assessed for age, body mass index, current smoking status, alcohol consumption, glucocorticoid use, diagnosis of

rheumatoid arthritis, prior fragility fracture, parental history of fracture, and T score. History of parental hip fracture was not available for members of the original cohort (1,456); these participants were classified as having no parental history of hip fracture. Femoral neck BMD was available for 4,224 participants.

The researchers used FRAX version 3.0 to calculate the 10-year probability of hip fracture and compared the expected number with the number observed in the cohort. A hip fracture was defined as a proximal femur fracture and was confirmed by review of medical records (including radiographic and surgical reports).

Among women aged 40-75 years, the incidence was 52 cases, compared with 57 expected by FRAX; among men aged 40-75 years, the incidence was 12 cases, compared with 23 expected by FRAX.

Notably, the observed probability of hip fracture in the oldest adults (aged 76-90 years) exceeded the number predicted by FRAX, while the opposite was true for those aged 40-75. However, these differences were not significant, the authors noted. Among women aged 76-90 years, the incidence was 65 cases, compared with 55 expected by FRAX; among men aged 76-90 years, the incidence was 17 cases, compared with 14 expected by FRAX.

The latest version of FRAX can be accessed at [www.shef.ac.uk/FRAX](http://www.shef.ac.uk/FRAX).

The study was supported by the National Institutes of Health. The researchers reported that they have no relevant financial relationships. ■

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