

Geometry May Explain Racial Differences in Fracture Rates

BY KERRI WACHTER
Senior Writer

PHILADELPHIA — Bone geometry appears to confer femoral strength to older black men and may account for some of the differences seen in fracture risk and bone mineral density between older black and white men, according to data presented at the annual meeting of the American Society for Bone and Mineral Research.

Dr. Marc C. Hochberg, professor of medicine and epidemiology at the University of Maryland, Baltimore, and his colleagues used hip structural analysis based on dual-energy x-ray absorptiometry (DXA) scan data to assess parameters of structural geometry of the proximal femur in older black and white men, in an attempt to account for reported differences in hip fracture and hip bone mineral density (BMD).

The researchers used data collected as part of the Baltimore Men's Osteoporosis Study, which recruited 503 white men and 191 black men aged 65 years and older. Black men were slightly heavier (mean weight 87 kg vs. 83 kg for white men) and slightly younger (mean age 72 years vs. 75 years for white men).

The researchers used hip structural analysis to calculate several measures of bone geometry, including the outer

diameter, the bone cross-sectional area, the section modulus (an indicator of bending strength), the estimated mean cortical thickness, and the estimated buckling ratio (an estimate of cortical stability in buckling) from DXA hip scans.

Hip structural analysis is an investigational technique used to assess bone geometry in cross-sections of three regions of the proximal femur: across the femoral neck at its narrowest point, in the intertrochan-

'Black men had more bone tissue and the bone was narrower, so the tissue was enclosed in a smaller volume.'

teric region (along the angle bisecting neck and shaft axes), and across the shaft (at a distance of 1.5 times the minimum neck width distal to the axes of intersection).

The geometric parameters were compared between racial groups, using age, height, lean mass, and lean mass fraction as covariates.

BMD was greater for black men at the narrow neck, intertrochanteric, and shaft regions. "Black men had more bone tissue and the bone was narrower, so the tissue was enclosed in a smaller volume," said Dr. Hochberg.

However, there was no difference in the calculated section modulus (a measure of resistance to axial bending) between white and black men

at any of the three sites.

"Since there were no differences in femur bending resistance between the black and the white men, narrower bone, therefore, requires more bone tissue to achieve the same bending strength," said Dr. Hochberg.

Narrower bone with thicker cortices would have a lower buckling ratio and, therefore, higher buckling strength.

Cortical thickness was significantly greater in black men than in white men at all three sites. This did correlate to lower buckling ratios, providing greater protection against buckling failure.

Overall, black men had greater cross-sectional area, which reflects more bone mass. They also had a narrower outer diameter (reflecting smaller bone), thicker cortices, and lower buckling ratios, which reduce the risk of failure on bending at all three sites within the hip.

"These geometric factors may explain the lower rate of hip fracture in older black men than in older white men," said Dr. Hochberg.

One limitation of the study is that hip structural analysis evaluates only bone geometry. "It's possible that some of the strength advantage of the femurs of older black men is actually due to stronger bone tissue, rather than more advantageous geometry," said Dr. Hochberg. ■

Inadequate Vitamin D in Infants Ups Type 1 Risk

BY MARY ELLEN
SCHNEIDER
New York Bureau

RENO, NEV. — Infants—especially breast-fed infants—at an increased risk for type 1 diabetes aren't getting the recommended levels of vitamin D in their diets, despite efforts to publicize the relationship between type 1 diabetes and insufficient vitamin D, according to a poster presented at the annual meeting of the American College of Nutrition.

Given the reported association between low intake of vitamin D and higher risk for type 1 diabetes, researchers with the Environmental Determinants of Diabetes in the Young (TEDDY) study decided to assess the vitamin D intake of children aged 3-12 months who possess a genetic predisposition to the autoimmunity associated with type 1 diabetes.

The dietary intake of the infants was compared with recommendations for vitamin D intake from the American Academy of Pediatrics (AAP).

The researchers analyzed vitamin D intake for 342 infants from the TEDDY centers in Colorado, Georgia, and Florida. Fewer than half of the children in the study (49%) met AAP guidelines for vitamin D intake at 3 months, and 56% met guidelines at 6 months. But compliance with the AAP recommendations increased over time. By 9 months of age, the percentage of infants meeting AAP recommendations for vitamin D intake increased to 73% and con-

tinued to rise to 79% by 12 months.

The current AAP recommendation calls for infants to receive 200 IU of vitamin D daily within the first 2 months of life. Infants and children who consume at least 500 mL per day of vitamin D-fortified formula or milk should meet the recommended intake, but vitamin D supplementation is necessary in breast-fed infants, according to the AAP (Pediatrics 2003;111:908-10).

The TEDDY researchers found that infants with very low intakes of vitamin D were generally those infants who were predominantly breast fed. Many infants who were primarily formula-fed had vitamin D intakes that were twofold higher than the AAP recommendations. And some formula-fed infants with very large energy intakes were receiving three- to fourfold more than the AAP's recommended daily intake of vitamin D, the researchers wrote.

These preliminary results are based on dietary intake data collected between September 2004 and July 2006. The researchers collected 24-hour diet recall and 3-day food diaries from the primary caretakers. The 3-day records were averaged to obtain daily intake, and nutrient values were calculated. The data collection is ongoing.

The TEDDY study is funded by the National Institutes of Health, the Centers for Disease Control and Prevention, and the Juvenile Diabetes Research Foundation. ■

Home Blood Pressure Monitoring Redirects Diabetes Patients

BY PATRICE WENDLING
Chicago Bureau

TUCSON, ARIZ. — Home blood pressure monitoring may have a role in changing diet and exercise habits in adults with type 2 diabetes mellitus, according to results from a small analysis presented at the annual meeting of the North American Primary Care Research Group.

Daily blood pressure monitoring was considered helpful in increasing awareness of blood pressure (BP) and making lifestyle changes in 21 of 24 patients. Overall, 77% of the patients reported making changes in their diet, and 50% exercised more as a result of daily blood pressure monitoring. Of the total, 54% of patients reported that their health status was "much better" or "somewhat better" after 6 months of home monitoring, reported Dr. Lauren DeAlleme and colleagues at the University of Colorado Health Sciences Center, in Denver.

At baseline, 17 patients (71%) had hypertension, 4 (17%) had a history of myocardial infarction, 2 (8%) had suffered transient ischemic attacks, and 19 (79%) had increased cholesterol, 13 of whom were on cholesterol-lowering medication.

The self-reported finding of improved health status was unexpected, given that the average age was 62 years in patients with diabetes and other health problems, Dr. DeAlleme noted in an interview. "We think it's a matter of empowerment, but there need to be more studies."

When asked, 92% of patients said they felt they could make lifestyle changes to control their blood pressure. However, 21% reported that checking their blood pressure makes them feel anxious and

that day-to-day BP variations worried them.

"Variations are not uncommon in practice, but patients tend to think their BP should be rock steady, whereas variability is normal and healthier," said Dr. DeAlleme of the department of family medicine at the university.

'Variations are not uncommon in practice, but patients tend to think their BP should be rock steady, whereas variability is normal and healthier.'

The analysis was part of the Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optimal Management of Multivessel Disease (Freedom) trial, an ongoing trial examining cardiovascular risk factors in

34 patients with type 2 diabetes. Of these patients, 75% are female, 64% white, 32% Hispanic, and 71% have prescription coverage.

Overall, 24 patients agreed to monitor

their BP daily with an automatic wrist cuff validated by the German Hypertension Society and to report their readings monthly via phone, mail, or the Internet. Feedback was provided to both the patients and their physicians. The target BP was a goal of less than 125 mm Hg/75 mm Hg.

The patients submitted an average of six reports; the average interval between reports was 40 days; and the preferred method of reporting was by mail.

There is evidence to suggest that home BP monitoring correlates better with ambulatory BP monitoring and target-organ damage than does office BP monitoring. Although the data are consistent, the number of studies is limited, Dr. DeAlleme said.

"The reason everyone hasn't jumped on this bandwagon is that there aren't any major [home] blood pressure studies, but I think home monitoring is going to be the wave of the future," she said. ■