High-Res CT Scan May Better Predict Fracture Risk

BY NANCY WALSH
New York Bureau

TORONTO — For the first time, the microarchitecture of cortical and trabecular bone can be visualized noninvasively using a high-resolution CT scanner, Dr. Pierre D. Delmas reported at a world congress on osteoporosis.

Measurement of bone density by dual-energy x-ray absorptiometry (DXA) captures only part of the fracture risk in postmenopausal women, Dr. Delmas said. Treatment decisions based on DXA alone can miss a large proportion of women who may have fractures later.

This development may ultimately permit a fuller understanding of the mechanisms involved in osteoporosis and provide more accurate fracture risk assessment and disease monitoring capability, he said.

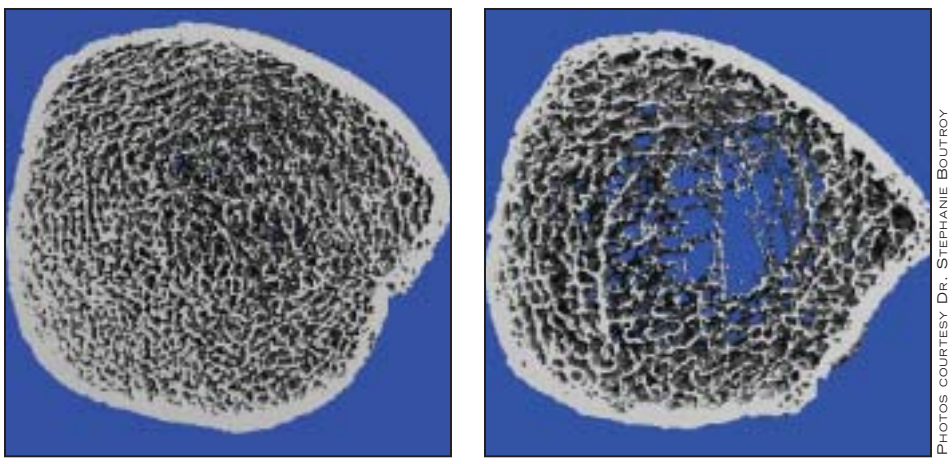
The device, a 3-D peripheral quantitative computed tomography (pQCT) scanner (XtremeCT, Scanco Medical AG, Bassersdorf, Switzerland), has greater resolution than conventional CT scanners, and permits visualization of trabecular number, thickness, and separation, as well as cortical thickness, said Dr. Delmas, professor of medicine, Claude Bernard University in Lyon, France.

As an example of the capability of this device, he described a case-control study that included 57 women who had experienced fragility fractures during 13 years of follow-up and were evaluated with pQCT. "We found that for every standard deviation decrease in total and trabecular density, and cortical and trabecular thickness, there was a significant increase in risk of fracture," he said. Moreover, the increases remained significant after adjusting for bone mineral density (BMD) as measured by DXA, suggesting that the two approaches are independent measurements of bone strength, said Dr. Delmas, who is president of the International Osteoporosis Foundation, the sponsor of the meeting. A further capability of the high-resolution pQCT device is that, unlike DXA, it can reveal localized abnormalities in bone structure, he said.

During a press briefing at the meeting Dr. Delmas was asked who might be an appropriate candidate for this type of evaluation. "We need to show in prospective studies that we can do better than with DXA. If we do so you could argue that any postmenopausal woman who is at risk of fracture should have the test, but it's too early to say," he replied.

He also commented that he and his colleagues plan to conduct studies using pQCT to measure the efficacy of therapy, and to gain insight into how antiosteoporosis drug therapy works. "The paradox is that we have a variety of drugs that are useful in decreasing the risk of fracture, but we're not always sure what is really causing the improved bone strength," he said. Changes in bone among premenopausal women, important for the overall understanding of skeletal fragility, also are being investigated.

In another presentation at the meeting, Dr. Stephanie Boutroy described a cross-sectional study that included 235 women aged 19-50 years who underwent a scan at the distal radius and tibia with the high-resolution device.



Photos courtesy Dr. Stephanie Boutroy

Shown are a 3-D peripheral quantitative CT scan of a tibia in a healthy woman (left) and a 3-D pQCT scan of a tibia in an osteoporotic woman (right).

Among the age-related changes seen were small increases in the radius and tibia cross-sectional areas without a correlating change in cortical thickness. "This reflects periosteal apposition and endosteal resorption of similar magnitude," explained Dr. Boutroy, also of Claude Bernard University. No correlation was seen in density and architecture parameters with age at the radius, but at the tibia there was an age-related 17% decrease in trabecular density, she said. This was explained by a decrease in trabecular number, separation, and distribution.

Age-related changes in bone architecture had been noted previously in another study by Dr. Boutroy and her colleagues that included 108 premenopausal and 148 postmenopausal women. Lumbar spine and femoral neck BMD were measured using DXA; volumetric BMD and microarchitecture were measured at the distal radius and tibia using high-resolution pQCT.

By using the high-resolution device, they were able to detect significant changes in trabecular density, number, and thickness, as well as in cortical thickness. They also found that, unlike with DXA, they were able to discriminate between women with osteopenia who had had a previous fracture and those who had not (J. Clin. Endocrinol. Metab. 2005; 90:6508-15).

The cost of the device is currently high, noted Dr. Delmas, at approximately $300,000, and there are only about 15 in use around the world. "But I expect that if our technique is validated by other studies and the device is produced on a larger scale the price will come down," he said, adding that he has no financial interest in the company. ■

High Medication Burden Noted In Women With Osteoporosis

BY DOUG BRUNK
San Diego Bureau

SAN DIEGO — About half of postmenopausal women who take bisphosphonates for osteoporosis take at least three concomitant medications and 15% take six or more, researchers led by Dr. Sydney Lou Bonnick reported during a poster session at the annual meeting of the International Society for Clinical Densitometry.

"Patients receiving bisphosphonate therapy for postmenopausal osteoporosis have a substantial pill burden," the researchers wrote in their poster. "Adherence to therapy may be improved if physicians consider prescribing more convenient, less frequently dosed medications."

Dr. Bonnick, medical director of the Clinical Research Center of North Texas in Denton, and her associates obtained patient prescription information from November 1999 to June 2004 from NDC-Health, a database that contains records from 14,000 retail pharmacies in the United States. They identified women aged 50 years and older who were receiving alendronate or risedronate, which were the bisphosphonates approved for osteoporosis treatment during the study period.

It was disclosed that GlaxoSmithKline, maker of once-monthly Boniva (ibandronate) supported the study.

Concomitant medications were defined as a minimum of a 2-week supply of medications prescribed in the same month as a minimum of a 2-week supply of bisphosphonates.

Between November 1999 and June 2004 the number of women in the database using bisphosphonates rose from 78,909 to 250,286.

Of the women prescribed concomitant medications, 74% were on two or more additional medications, 52% were on three or more, and 15% were on six or more. The percentage of women taking six or more concomitant medications increased from 12% to 19% during the study period.

The most common concomitant drugs taken were cholesterol reducers, synthetic thyroid hormones, calcium channel blockers, β-blockers, ACE inhibitors, and systemic antiarthritis medications. ■

IV Ibandronate Equivalent to Oral Form for Increasing BMD

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

BOSTON — Intermittent intravenous ibandronate is at least as effective as daily oral ibandronate for increasing bone mineral density and may be preferable to oral dosing in patients with esophageal disease or compliance problems.

There are no fracture data for the intravenous dosing schedule, but the risk reduction that has been shown with oral ibandronate can probably be extrapolated to the intravenous form of the drug, Dr. Mone Zaidi said at the annual meeting of the Endocrine Society.

Oral ibandronate has been shown to reduce the risk of new vertebral fractures by up to 60% (Curr. Med. Res. Opin. 2005;21:391-401; J. Bone Miner. Res. 2004;19:1241-9). "If you can show equivalence or superiority in bone mineral density changes to [the form] with proven fracture data, which we have done, I think everyone would agree that you can extrapolate that data," said Dr. Zaidi, director of the Mount Sinai Bone Program, Mount Sinai School of Medicine, New York.

Dr. Zaidi presented 2-year bone mineral density (BMD) data from the ibandronate Dosing Intravenous Administration trial, a Roche-sponsored phase III study that compared two doses of intravenous ibandronate (2 mg every 2 months and 3 mg every 3 months) with the approved oral dosing schedule (2.5 mg daily). The study group included 1,400 postmenopausal women with low bone mass (T scores of –3.3 for total spine and –2 for hip).

After 2 years, BMD at the lumbar spine increased significantly more in both intravenous groups than in the oral group (mean increase 6.4% for the 2-mg IV dose, 6.3% for the 3-mg IV dose, and 4.8% for the oral dose). BMD increased similarly at all other sites measured, with consistently greater gains in both intravenous groups than in the oral group, Dr. Zaidi said.

At 2 years, the incidence of adverse events was similar across all groups. There was no osteonecrosis of the jaw. Renal and urinary incidents were uncommon and similar across groups.

Fracture incidence, which was reported as an adverse event, was low and similar in all groups, although Dr. Zaidi stressed that the study was not powered to prove fracture risk reduction. ■