New Scanning Study Points to Osteoporosis/Heart Disease Link

Veronica Hackethal, MD | |July 07, 2015

People with ischemic heart disease have lower bone-mineral density (BMD) of the wrist, according to a recent study using a new scanning technology that shows a link between cardiovascular disease and bone loss. The study was published in the July issue of *Osteoporosis International.*

"Our data suggest that bone health should be considered when patients are diagnosed with heart disease," commented senior author Cyrus Cooper, OBE, FMedSci, professor of musculoskeletal science, University of Oxford, and professor of rheumatology at the University of Southampton, United Kingdom.

The findings suggest there may be a common etiology between the two conditions, and there is a need to better understand this association to improve bone health, say the researchers. Although cardiovascular disease and osteoporosis have not commonly been linked together, people with heart disease are more likely to develop osteoporosis, according to Dr Cooper. "This risk is found in elderly women as well as men," he said.

"There is much interest in comorbidity research right now and evidence that managing the whole patient, rather than just each disease at a time, is more likely to result in improved longer-term quality of life," he added.

Asked to comment, Bart Clarke, MD, professor of medicine at the Mayo Clinic in Rochester, Minnesota, told *Medscape Medical News* that the study "demonstrates a clear link between ischemic heart disease and cortical bone loss and increased cortical porosity and possibly fracture risk at the radius."

It is an "important" study that "should have an impact in the long term," he added. However, the big question remains whether this will change how often clinicians check bone density in this patient population, because many of the people who get ischemic heart disease are already considered at risk for osteoporosis simply because of age.

Link Between Heart Disease and BMD at Radius, but Not Tibia

The researchers explain that cardiovascular disease, vascular calcification, and osteoporosis are common in elderly individuals and have previously been regarded as independent age-related disorders. But some studies have suggested overlap in the etiological mechanisms of these diseases — for example, bone metabolism and vascular physiology share several regulatory factors, and the process of vascular calcification in many ways resembles that of bone formation.

But the knowledge of bone microarchitecture in patients with cardiovascular disease is still sparse, they note.

So using the population-based Hertfordshire Cohort Study, which followed a group of men and women born in the 1930s to look at growth in infancy and how it influences adult diseases like osteoporosis, they included 350 participants (166 women, 184 men) aged 71.5 to 80.5 years.

They either had a history of ischemic heart disease (heart attack, angina, heart failure, n = 75) or did not (n = 275).

The researchers used a sophisticated technique called high-resolution peripheral quantitative computed tomography (HR-pQCT) to look at bone geometry, density, and microstructure of the nondominant distal radius and the distal tibia. Structured interviews and physical exams took place during visits to participants' homes.

Results showed that, compared with participants without ischemic heart disease, both women and men with ischemic heart disease had lower cortical volumetric BMD ($P < .001$) and increased cortical porosity of the distal radius ($P = .016$); this finding remained significant even after adjustment for multiple confounders ($P = .002$).

No significant differences were found for cortical thickness ($P = .519$), or measures of trabecular microarchitecture ($P > .05$ for all).

In both women and men, no significant associations were found for ischemic heart disease and bone measurements of the distal tibia. Likewise, no statistical differences were found for ischemic heart disease and history of fractures ($P = .984$).

The authors suggest that the lack of association may be due to low numbers of study participants with ischemic heart disease.

Dr Clarke commented: "It is not clear why the same findings were not seen at the tibia, but perhaps this is because weight-bearing at the tibia prevents cortical bone loss there."

Think About Checking BMD in Heart Disease

Lower BMD of the wrist "most likely" is due to increased porosity and bone remodeling of cortical bone in people with ischemic heart disease compared with those without, the authors hypothesize.

Key mechanisms could include poor growth in utero, which could in turn increase the risk of heart disease and osteoporosis later in life, Dr Cooper explained.

Other possible explanations include estrogen deficiency in postmenopausal women, insulin resistance, and lifestyle factors associated with heart disease that can predispose to bone loss, such as smoking and lack of exercise, he added.

The study didn't include lab assessments, so the group was unable to investigate how bone metabolism in those with heart disease might have been affected by lower vitamin D levels or altered renal function, for example, the authors note.

"This is one of the first studies to use this technology to explore bone geometry, density, and microstructure in patients with heart disease, Dr Cooper stressed.

"The impact on clinical practice of this study may be to make clinicians think that when a person is diagnosed with ischemic heart disease, we probably should think about checking bone density, because that would pick up a certain number of people who have osteoporosis whom we didn't know about," he concluded.

Dr Cooper reports consultancy fees and honoraria from Servier, Eli Lilly, Merck, Amgen, Alliance, Novartis, Medtronic, GlaxoSmithKline, and Roche. The coauthors declare they have no relevant financial relationships, as does Dr Clarke.

Osteoporosis Int. 2015;26:1893-1901. Abstract

Send comments and news tips to news@medscape.net.

Cite this article: New Scanning Study Points to Osteoporosis/Heart Disease Link. *Medscape*. Jul 07, 2015.