Race, Gender Complicate Heart Disease, BMD Link

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PHILADELPHIA — White men and black women are at an increased risk for cardiovascular disease for each standard deviation decrease in volumetric bone mineral density, according to data presented at the annual meeting of the American Society for Bone and Mineral Research.

White men have an almost 40% increased risk for each standard deviation decrease in volumetric spine bone mineral density (BMD), while black women appear to have up to a 44% increased risk for each standard deviation decrease in areal BMD, presenting a complicated picture of how bone mass and cardiovascular disease interact with gender and race, said Ghada N. Farhat, Ph.D., an epidemiology research associate at the University of Pittsburgh.

Previous studies have linked low bone mass with increased cardiovascular mortality and morbidity and clinical measures of atherosclerosis. However, many of these studies primarily have involved white women. Less is known about the associations between bone mass and cardiovascular disease (CVD) in men and other races, Dr. Farhat said.

Dr. Farhat and her colleagues performed a longitudinal analysis looking at CVD incidence and bone mass using data from the Health, Aging and Body Composition (Health ABC) study. The Health ABC study was designed to assess the association between changes in body composition and functional decline.

This analysis involved 2,310 adults aged 68-80 years who were included if CVD free at baseline. The cohort was composed of slightly more men (55%) and white patients (58%). Study participants had to be free of disability in activities of daily living and free of functional limitations (defined as any difficulty walking a quarter of a mile or walking up 10 steps without resting) at baseline.

Incidence of CVD was defined as the onset of one or more of the following conditions between study entry and mean follow-up of 5.4 years: coronary heart disease, cerebrovascular disease, peripheral artery disease, and coronary artery disease.

Baseline areal BMD data (obtained by dual-energy x-ray absorptiometry) was available for the total hip, femoral neck, and trochanter in all patients. Baseline volumetric BMD data (obtained by quantitative CT) was available for the trabecular, integral, and cortical spine in a subset of 1,095 patients.

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The researchers used Regression analysis to assess associations of BMD measures (per standard deviation decrease) with CVD. They controlled for body mass index, physical activity level, lipids, blood pressure, and other covariates in their analysis models.

During follow-up, 23% of the men and 14% of the women developed CVD. White men had the highest incidence, followed by black men, black women, and lastly white women.

Significant interactions were observed between race and spine volumetric BMD in men. "In black men, there were no associations between volumetric BMD measures and CVD," Dr. Farhat said. However, in white men, significant associations were observed between spine volumetric BMD measures and CVD. White men had an increased risk of 39% and 38% for each decrease of one standard deviation for integral and cortical spine BMD, respectively.

Significant interactions were also observed between race and all of the areal BMD hip measures among women. "In black women, we observed that all of the areal BMD measures of the hip showed significant associations with CVD," Dr. Farhat said. In black women, the risk of CVD was increased by 36%, 44%, and 34% for each decrease of one standard deviation in areal BMD of the total hip, femoral neck, and trochanter, respectively. No significant associations between CVD and hip areal BMD measures were observed in white women. Neither IL-6 nor TNF-α nor oxidized LDL cholesterol levels could explain the association of BMD with the incidence of CVD, she said.

Dr. Farhat reported that she had no conflicts of interest. ■

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