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NEWS

RSNA Press Release

Coronary Artery Calcium: The More You Have, The More You'll Get

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OAK BROOK, Ill.--The rate of coronary artery calcium progression is not significantly different in men than in women. Rather, it is primarily dictated by the amount of calcium already present, according to a study published in the July issue of the journal Radiology. This represents an important step in identifying those most in need of heart-healthy lifestyle changes such as weight loss, regular exercise, and a low-fat diet, as well as treatment with aspirin or a cholesterol-lowering statin drug.

While earlier studies have cited gender and age as a factor, this new study, from researchers at the Kaiser Moanalua Medical Center in Honolulu, Hawaii, and UCLA School of Medicine, in Los Angeles, California, indicates that the progression of coronary artery calcium is largely determined by the amount of calcium present at the time of initial measurement, or scoring.

In general, the more calcium there is in a person's coronary arteries, the greater the chance that the coronary arteries will become narrowed. "There is a definite positive relationship between the amount of coronary artery calcium and the likelihood of significant atherosclerotic coronary artery disease," said lead author of the study, Hyo-Chun Yoon, M.D., Ph.D.

It is now possible, using an ultrafast CT (computed tomography) method called electron beam CT, or EBCT, to assign a calcium score that reflects how much calcium is present in the coronary arteries. EBCT is a painless and convenient test that scans the entire heart in a single breath-hold. Repeat testing will show the course of coronary calcium deposits over time in a particular individual.

The EBCT findings were reviewed for 217 consecutive people, including 114 men and 103 women, with a mean age of 57 years, lacking symptoms of coronary artery disease, who had two or more EBCT exams. The time between the first and last studies averaged about two years. The study found that the most important factor in how rapidly calcium accumulated over time in the coronary arteries was the amount found at the initial scoring. Two clinical conditions, high blood pressure and diabetes, were also significant predictors of how rapidly coronary artery calcium progressed.

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Unexpectedly, however, neither gender nor age was a predictor. Although previous research has pointed to faster progression of coronary artery calcium in men than in women, and also in older people, the new findings indicate that the lower rate of progression in calcium scores seen in women compared to men reflected a lower initial amount of calcium. By the same token, younger persons had lower rates of progression because, on initial study, they had less calcium than their older counterparts.

How do these results translate into clinical practice? "It may be reasonable to repeat EBCT every one to two years in patients with relatively high initial calcium scores," explained Dr. Yoon. In contrast, those lacking calcium or having only a trace amount are unlikely to benefit from being screened at anything less than three-year intervals. It should be noted that a rare patient who lacks calcium deposits still may have significant coronary artery narrowing.

Dr. Yoon believes that, "In future studies, patients with large amounts of calcium may serve as a better population in which to study the effects of different pharmaceutic interventions on atherosclerosis," but, for the present, EBCT has clearly demonstrated that, in the researchers' words, "Calcium begets calcium."

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"Calcium Begets Calcium." Collaborating with Dr. Yoon on this paper were Aletha Emerick, B.A., Jennifer Hill, M.D., David Gjertson, Ph.D., and Jonathan G. Goldin, M.D., Ph.D.

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