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CT scans that detect calcium deposits in heart arteries can help predict the risk of coronary heart disease

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Even among relatively young and healthy men, CT scans that detect calcium deposits in heart arteries can help predict the risk of coronary heart disease, according to a new study in the Sept. 6, 2005, issue of the Journal of the American College of Cardiology.

"Over and above standard risk factors, the presence of coronary calcium portended a roughly 11-fold risk of developing heart disease in the following three years. And these were individuals that didn't have a lot of risk factors and were relatively young: men in their mid-40s, at a time when people are at the prime of their work and family lives," said Allen J. Taylor, M.D., F.A.C.C., at Walter Reed Army Medical Center in Washington, D.C., and the Uniformed Services University of the Health Sciences in Bethesda, Md.

The researchers studied Army personnel, 40 to 50 years old, who were undergoing routine physical examinations. Out of an eligible pool of 2,259 individuals free of known heart disease, 1,627 men and 356 women underwent coronary CT scans and were followed for an average of three years.

During the follow-up period there were only nine heart disease events (heart attack, unstable angina or death due to coronary heart disease) in the study population, but seven of the events were among the 364 men whose CT scans detected coronary calcium. Only two events occurred among the larger group of 1,263 men without detectable calcium deposits. There were no events among the women in the study.

The results indicate that the men with calcium deposits were 11.8 times as likely to suffer an event as men without calcium deposits. In absolute terms, just under 2 percent of the men with calcium deposits suffered a cardiac event within the three year average follow-up, compared to less than two-tenths of a percent of the men without deposits.

Dr. Taylor said that even though these results show that coronary calcium scans can predict risk among men who were younger and healthier than those included in earlier studies, more study is needed before recommending such scans for all healthy, middle-aged people.

"Although it appeared that screening would be relatively cost-effective in the analysis that we did, I think at this time you have to stop short of recommending screening in all asymptomatic individuals, because it is not shown that such a strategy could actually prevent adverse outcomes," Dr. Taylor said.

He emphasized that in order for screening scans to be useful, they would have to be coupled with follow-up treatments and lifestyle changes that could effectively prevent cardiac events. He added that researchers should focus on identifying individuals who might get the most benefit from coronary calcium scans, rather than recommending scans for everyone. Those

candidates for screening might include people who are left in a gray area, neither high-risk nor low-risk, based on current risk factor calculations, he said. Dr. Taylor also noted that a family history of heart disease appeared to be associated with both coronary calcium and heart disease events in this study.

"What's nice from a clinician's standpoint is that about one in five men had coronary calcium. So the scan results would let you look at this sub-population of 20 percent of the men and say, okay, you are the group we're going to focus on. As a clinician, that's valuable, because you don't have time to devote the same amount of attention to every single patient, and you want to devote extra time to the people who are more at risk, and not have folks worry when they have low risk." Dr. Taylor said.

He said this study had several strong points, including the fact that the participants were not self-selected or referred for inclusion in the study. He also noted the very high follow-up rate: more than 99 percent of the participants were included in the final analysis.

However, the study also had limitations. There were not enough women in the group, and the men in the study were mostly white. Dr. Taylor said further studies are needed to ascertain the usefulness of coronary CT scanning among women and men in various ethnic populations.

Alan D. Guerci, M.D., F.A.C.C., at St. Francis Hospital in Roslyn, N.Y., who was not connected with this study, said the results provide new information about the association between coronary calcium and heart disease risk.

"The primary importance of this study is that it extends the observation that the coronary calcium score predicts coronary artery disease events independently of standard risk factors to a younger age group. The small number of events makes application of the results uncertain. For example, just which younger adults should be scanned is not clear," he said.

Leslee J. Shaw, Ph.D., at Cedars-Sinai Medical Center in Los Angeles, who also was not part of the research team, said this study is part of the growing number of high-quality, prospective registries examining the prognostic value of coronary calcium.

"The practical implications of this are that these results are highly generalizable to a sizeable proportion of the U.S. population. As compared with prior reports that are largely in older, higher-risk subjects or in patient populations, the data from the Prospective Army Coronary Calcium Project are similar to the average U.S. early middle-aged adult. This provides us with the lower bounds of evidence upon which to shape health policy and provides encouraging evidence on developing universal screening policies for subclinical disease," Dr. Shaw said.

Dr. Shaw also noted that the cost-effectiveness analysis in this study will help guide decisions about national strategies for screening.

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