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NEWS

RSNA Press Release

CT Angiography Helps Predict Heart Attack Risk

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At A Glance

- Coronary CT angiography may help predict heart attack risk in individuals with no modifiable risk factors.
- Modifiable risk factors for coronary artery disease include high blood pressure, elevated cholesterol, diabetes and smoking.
- A study of 5,262 patients with suspected coronary disease revealed a high prevalence of coronary artery disease, despite the absence of modifiable risk factors.

OAK BROOK, Ill. — Coronary computed tomography angiography (CCTA) is an effective tool for determining the risk of heart attacks and other adverse cardiac events in patients with suspected coronary artery disease but no treatable risk factors, such as high cholesterol or high blood pressure, according to a new study published online in the journal *Radiology*.

"CCTA should be considered as an appropriate first-line test for patients with atypical chest pain and suspected but not confirmed coronary artery disease," said the study's lead author, Jonathon Leipsic, M.D., FRCPC, from the University of British Columbia in Vancouver.

Heart disease is the leading cause of death in the U.S., according to the Centers for Disease Control and Prevention. Treatment often involves addressing modifiable cardiovascular risk factors such as elevated cholesterol, high blood pressure, diabetes and smoking. However, some risk factors, like family history, are not modifiable, and no risk models exist to help guide clinicians to identify those symptomatic patients without cardiac risk factors who are at an increased risk of death and myocardial infarction.

"This scenario, where patients are symptomatic but have no cardiac risk factors, comes up often in clinical practice," Dr. Leipsic said. "We lack a good tool to stratify these patients into risk groups."

CCTA is a noninvasive test that has shown high accuracy for the diagnosis or exclusion of coronary artery disease in individuals. However, referral for patients with suspected coronary artery disease is often based on clinical risk factor scoring. Less is known about the prognostic value of CCTA in individuals with no medically modifiable risk factors.

In the first study of its kind, Dr. Leipsic and colleagues correlated CCTA findings with the

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risk of major adverse cardiac events in 5,262 patients with suspected coronary artery disease but no medically modifiable risk factors. They culled the data from the Coronary CT Angiography Evaluation For Clinical Outcomes: An International Multicenter (CONFIRM) registry.

After an average follow-up of 2.3 years, 104 patients had experienced a major adverse cardiovascular event. The researchers identified a high prevalence of coronary artery disease in the study group, despite the absence of modifiable risk factors. More than one-quarter of the patients had non-obstructive disease or disease related to the buildup of plaque in the arteries, and another 12 percent had obstructive disease with a greater than 50 percent narrowing in a coronary artery.

"We found that patients with narrowing of the coronary arteries on CT had a much higher risk of an adverse cardiac event," Dr. Leipsic said. "This was true even for those without a family history of heart disease."

Both symptomatic and asymptomatic patients with obstructive disease faced an increased risk for a major cardiac event. In contrast, the absence of coronary artery disease on CCTA was associated with a very low risk of a major event.

The findings highlight the need for refinement in the evaluation of individuals who may be missed by traditional methods of coronary artery disease evaluation.

"If a patient shows up with vague symptoms and no medically modifiable risk factors, doctors often dismiss them or do a treadmill test, which won't identify atherosclerosis and only has a modest sensitivity for detecting obstructive disease," Dr. Leipsic said.

CCTA could help address this problem, Dr. Leipsic added, by helping to diagnose or rule out coronary artery disease and identifying those who may benefit from more intensive therapy.

The researchers continue to study the CONFIRM data with the aim to learn more about the relationship between plaque and heart attacks and the longer-term outlook for patients with coronary artery disease.

"We are now collecting data to determine the prognostic value of CCTA after five years or more of follow-up, which will be very important for the field," Dr. Leipsic said.

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"Cardiovascular Risk Among Stable Individuals with Suspected Coronary Artery Disease But No Medically Modifiable Risk Factors: Results from an International Multicenter Study of 5262 Patients." Collaborating with Dr. Leipsic were Carolyn M. Taylor, M.D., Gilat Grunau, Brett G. Heilbron, M.B.B.S., G.B.J. Mancini, M.D., Stephan Achenbach, M.D., Mouaz Al-Mallah, M.D., Daniel S. Berman, M.D., Matthew J. Budoff, M.D., Filippo Cademartiri, M.D., Ph.D., Tracy Q. Callister, M.D., Hyuk-Jae Chang, M.D., Victor Y. Cheng, M.D., Kavitha Chinnaiyan, M.D., Benjamin J.W. Chow, M.D., Augustin Delago, M.D., Martin Hadamitzky, M.D., Joerg Hausleiter, M.D., Ricardo Cury, M.D., Gudrun Feuchtner, M.D., Yong-Jin Kim, M.D., Philipp A. Kaufmann, M.D., Fay Y. Lin, M.D., Erica Maffei, M.D., Gilbert Raff, M.D., Leslee J. Shaw, Ph.D., Todd C. Villines, M.D., and James K. Min, M.D.

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