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CT angiography for low-risk heart patients leads to more drugs and tests without benefit

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Coronary computed tomographic (CT) angiography, which can detect plaque buildup in heart vessels, is sometimes used as a screening tool to assess the risk for a heart attack. However, the usefulness of the test on low-risk patients who do not have coronary symptoms, such as chest pain, has been unclear.

In the first large population study to assess the impact of the test on physicians and patients, Johns Hopkins cardiologists found that having CT angiography leads to more prescriptions for cholesterol-lowering medications and aspirin, as well as more stress tests, nuclear medicine scans and invasive catheterizations. However, the incidence of heart attacks or cardiac death among people in the study was the same, whether or not patients had a CT angiography test.

"There was no difference in cardiac events at 90 days or at 18 months between the group that had positive findings on the CT angiogram screening compared to the group that did not have the test," says John W. McEvoy, M.B., BCh., BAO, a Johns Hopkins heart specialist and lead author of the study. "Our findings suggest that low-risk patients without symptoms don't benefit in the short term from knowing whether or not plaque has been detected using CT angiography. However, their physicians may be inclined to be more aggressive with prescriptions or follow up tests," McEvoy adds.

For the study, published online in Archives of Internal Medicine on May 23, 2011, researchers compared two similar groups of 1,000

asymptomatic patients who were taking part in a health screening program in South Korea. Patients in one of the groups had coronary CT angiography while a matched control group of 1,000 patients did not have the test. The baseline heart disease risk factors were the same in both groups and none of the patients had chest pain or other symptoms. The mean age of the participants was 50, and 63 percent were men. All were given the standard of care and were advised on ways to lower their risk.

Of the 1,000 patients who had CT angiography, 215 had a positive result, meaning that waxy plaque deposits were seen in their vessels. As a result, they were much more likely to have more aggressive care, according to the study findings.

After 18 months, the patients with plaque detected on the test were 10 times more likely to have been sent for an exercise stress test, a nuclear medicine scan or a cardiac catheterization, compared with those patients who didn't have the test. Also, they were three times more likely to be taking a statin medication and four times more likely to be on aspirin therapy.

After 18 months, one person in the CT angiography group developed unstable angina, while one person in the control group had a fatal heart attack.

"Our data are consistent with current guidelines by the American Heart Association that screening CT angiography should not play a role for low-risk patients who do not have symptoms," says Roger Blumenthal, M.D., a co-author of the study who is a professor of medicine and director of the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease.

"Before we advocate for a particular screening test, we need to

demonstrate its potential benefit and define the patient populations for whom the test would be useful," says Blumenthal, who adds that a CT angiography test can cost between $600 and $1,000.

CT angiography uses radiation and patients can have allergic reactions to the contrast material. Taking medications, such as aspirin and statins, and invasive procedures, such as catheterizations, also pose some risks. That is why the benefits and the risks need to be carefully evaluated.

Johns Hopkins heart specialist Michael Blaha, M.D., M.P.H., a co-author on the study, stresses that the findings of the study only apply to people considered at low risk of cardiovascular events, such as a heart attack, in the next 10 years. "There does seem to be a role for CT angiography in patients who have chest pain, particularly in the emergency room setting. There, CT angiography offers the opportunity to exclude atherosclerosis as the cause of the symptoms, which can be very helpful in the triage of patients," Blaha says.

The senior author of the study, Hyuk-Jae Chang, M.D., Ph.D., is a cardiologist at the Yonsei University Health System in Seoul, South Korea, whose large data set was used in the study. He had asked Dr. Blumenthal to collaborate on the research.

"This was a unique opportunity to analyze the data and look at the downstream impact of the test on physicians and patients," says Blumenthal.

CT angiography is different from another test, called calcium scoring, which has been established as a useful way to assess risk among people with an intermediate risk of a heart attack within 10 years. CT angiography is a more sensitive test than calcium scoring, showing not just calcified areas of plaque in heart arteries but also the fatty deposits that form earlier and have not hardened yet. However, CT angiography

requires an injection of contrast material, delivers more radiation than calcium scoring, and is more expensive.

In a commentary accompanying the study, Michael S. Lauer, M.D., from the National Heart, Lung and Blood Institute, says the study serves as a powerful reminder that testing without evidence of a benefit "can lead to exposure to further medical tests and treatments, each of which carries its own risk."

"We cannot simply assume that just because a screening test predicts clinical outcomes, interventions necessarily will prevent them," Lauer adds in his commentary.

The Johns Hopkins authors say more study is needed, including continued assessment of the population in this study. "We need longer follow-up because statin and aspirin therapies have been shown to be beneficial in primary prevention of heart attacks in older patients with multiple cardiac risk factors. In 5 to 10 years, these interventions among the patients who had positive findings on CT angiography may ultimately show some benefit. Right now, we just don't know," says McEvoy. He adds, "A randomized, controlled trial should be considered to provide more information."

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