

New formula developed to reassure patients about low heart attack risk

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(Medical Xpress) -- If your doctor says you have a negative stress test, or that your cholesterol or blood pressure are normal, how assured can you be that you're not likely to have a heart attack in the next seven to 10 years? Assessing traditional risk factors, such as age, high blood pressure, cholesterol, smoking and family history can estimate a person's risk, but the picture is not always clear-cut. Some newer tests can be offered to provide reassurance or guidance about the need for medications or further testing.

Michael Blaha, M.D., M.P.H, from the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease, has developed a simple mathematical formula to help doctors calculate their patients' risks based on a variety of tests, such as a blood test for C-reactive protein, carotid ultrasound and coronary calcium scoring, which are not part of the usual menu of risk factors. The goal was to determine which test, if results were normal, would provide the most reassurance for patients.

The study shows that by far, a test that looks for coronary calcium is the best indicator of low risk compared with other tests. Blaha will present the results of the study, "Comparing Zero Coronary Artery Calcium with Other Negative Risk Factors for Coronary Heart Disease," at the American Heart Association Scientific Sessions.

Blaha and his colleagues used data from the Multi-Ethnic Study of Atherosclerosis (MESA), a longitudinal study of more than 6,800 people without cardiovascular disease at enrollment who have been followed for

an average of seven years. They compared heart attack rates in the study population with results of tests the individuals had been given to assess their risk. In that way, the researchers could calculate which tests predicted the lowest heart attack risk. They found that a coronary calcium score of zero, meaning no coronary calcium could be seen in heart arteries, was, by far, the most reassuring indicator.

“None of the other tests, such as C-reactive protein, are sensitive enough to reassure patients that they have a very low risk of a heart attack over the next seven years,” says Blaha. “The findings related to coronary artery calcium are important from a public health perspective because they mean we can identify people who do not need further testing or medical interventions for the immediate future.”

Coronary calcium scoring is a CT test that uses about the same amount of radiation as a mammogram to show evidence of calcium buildup in arteries feeding the heart. C-reactive protein is a marker of inflammation somewhere in the body that is assessed by a blood test. Carotid ultrasound looks at fatty deposits in arteries or thickening of the artery walls in the neck.

According to Blaha’s new model, if a patient is thought to have a 10 percent risk of a heart attack, according to the widely regarded Framingham risk scale, and the patient’s calcium scoring test shows zero coronary calcium, his projected risk could be reduced to 3 percent. “That’s a meaningful change in the estimated risk that will influence patient treatment,” Blaha says. Half of the people in MESA between age 45 and 84 had zero levels of coronary calcium.

In contrast, for the same group of people whose risk of a heart attack in over the next decade was thought to be 10 percent because of traditional risk factors, a low C-reactive protein level only reduced their true risk to nine percent, according to Blaha’s model. “Therefore,” says Blaha,

“finding no coronary calcium is a much more robust predictor of low risk compared with having low levels of C-reactive protein.”

Along the same lines, those with a 10 percent risk of a heart attack based on traditional [risk factors](#), whose carotid artery test is normal, would see a drop in their risk to seven percent, based on Blaha’s model.

“This ingenious mathematical model may provide a useful tool to help physicians assess their patients’ risk,” says Roger S. Blumenthal, M.D., professor of medicine and director, Johns Hopkins Ciccarone Center for the Prevention of Heart Disease. “It may also have public health significance in terms of guiding the proper allocation of health care resources, including medications.”

Blumenthal says coronary calcium scoring to assess heart disease risk is analogous to a bone density test to assess the risk of bone fracture. “If a 60-year-old woman has a family history of osteoporosis and is thin,” he explains, “she may be presumed to be at high risk for bone fractures. A bone density scan would provide a key piece of information about her actual risk and need for medication to lower her risk of fractures.”

He adds, “We don’t prescribe medicine to prevent fractures to all postmenopausal women— only to those who have osteoporosis on the basis of a bone density scan. In the same way, coronary calcium scoring can tell us whether or not there is evidence of hardening in the walls of the heart arteries and therefore, more accurately determine a person’s risk of a [heart attack](#) or other cardiac event.”

Provided by Johns Hopkins University

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