Medical Xpress

Simple ultrasound test improves diagnosis of heart disease

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New research shows that doing a simple ultrasound scan of the carotid artery significantly improves the prediction of heart disease, giving doctors a better clue of who is at high risk for a heart attack.

The new study, published in today's *Journal of the American College of Cardiology (JACC)*, shows that approximately 23 percent of patients would be reclassified into a different risk group by adding information obtained from the noninvasive test and that risk prediction using this approach was more accurate.

"Today, up to 70 percent of people who have heart attacks are in a low or intermediate risk category for a heart attack when their risk is estimated using traditional risk prediction models. That's not very predictive, and we need to do better," said Dr. Christie Ballantyne, director of the Center for Cardiovascular Disease Prevention at the Methodist DeBakey Heart & Vascular Center and Baylor College of Medicine in Houston and last author on the study. "Our research shows that a noninvasive ultrasound can give us a more complete snapshot of our patients' risk, so we can do a better job determining if they'll have a heart attack."

This is significant because patients who are at higher risk could be treated more aggressively to prevent heart disease.

Using ultrasound, researchers examined the carotid artery of 13,145 patients. The carotid artery feeds oxygenated blood from the heart to the

brain. The researchers analyzed the thickness of the artery wall and the presence or absence of plaque inside the artery to determine if these factors influence risk for heart attack and coronary heart disease when added to traditional risk factors such as age, high blood pressure, high cholesterol, low good cholesterol, smoking and obesity.

"We have known that people with heart disease tend to have thicker carotid arteries on ultrasound, but we now know how to use the artery thickness and presence or absence of plaque to better predict who is at risk for heart disease," said Dr. Vijay Nambi, cardiologist with Methodist and Baylor, and first author on the study.

The analysis was performed using data from the Atherosclerosis Risk In Communities (ARIC) study. An online heart disease risk calculator will now be available at aricnews.net that will help doctors estimate risk incorporating information about the carotid artery thickness and presence or absence of plaque.

About the study

Methods Risk prediction models (overall, and in men and women) considered included traditional risk factors (TRF) only, TRF plus carotid intima media thickness (C-IMT), TRF plus plaque, and TRF plus C-IMT plus plaque. Model predictivity was determined by calculating the area under the receiver-operating characteristic curve (AUC) adjusted for optimism. Cox proportional hazards models were used to estimate 10-year coronary heart disease (CHD) risk for each model, and the number of subjects reclassified was determined. Observed events were compared with expected events, and the net reclassification index was calculated.

Results Of 13,145 eligible subjects (5,682 men, 7,463 women), 23 percent were reclassified by adding C-IMT plus plaque information.

Overall, the C-IMT plus TRF plus plaque model provided the most improvement in AUC, which increased from 0.742 (TRF only) to 0.755 (95 percent confidence interval for the difference in adjusted AUC: 0.008 to 0.017) in the overall sample. Similarly, the C-IMT plus TRF plus plaque model had the best net reclassification index of 9.9 percent in the overall population.

Conclusions Adding plaque and C-IMT to TRF improves CHD risk prediction in the ARIC (Atherosclerosis Risk in Communities) study.

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