

Measuring oxidative stress can predict risk of atrial fibrillation

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Measuring oxidative stress may help doctors predict the risk of developing atrial fibrillation, the most common heart beat irregularity. Research from Emory University School of Medicine has identified a connection between oxidative stress and enlargement of the heart's left atrium, which leads to atrial fibrillation.

The data is being presented on Monday, April 4, by Emory cardiology researcher Nima Ghasemzadeh, MD, at the American College of Cardiology meeting in New Orleans. Working with Arshed Quyyumi, MD, professor of medicine and director of the Emory Cardiovascular Research Institute, Ghasemzadeh followed 629 patients undergoing [cardiac catheterization](#) at Emory (average age 63) for three years.

Atrial fibrillation is a risk factor for stroke because it causes ineffective pumping and pooling of blood, which may lead to blood clots in the heart's upper chambers (the atria). The risk of atrial fibrillation increases with age, and three to five percent of people over 65 have atrial fibrillation.

[High blood pressure](#), obesity, diabetes, smoking and previous heart disease are all risk factors for atrial fibrillation. Yet the symptoms of atrial fibrillation, such as rapid heart rate, palpitations and shortness of breath, can be episodic and variable in severity and are not always reported in routine check-ups.

In the Emory study, 38 out of 629 patients developed atrial fibrillation.

People with high levels of the amino acid cystine in their blood at the start of the study were 2.1 times more likely to develop atrial fibrillation over the next three years, even after correcting for traditional risk factors. The presence of mitral regurgitation (heart valve leakage) and being a male also increased the risk of developing atrial fibrillation.

Oxidative stress is an imbalance in [cellular metabolism](#) connected with cardiovascular disease. Oxidative stress reflects a breakdown in the body's ability to regulate [reactive oxygen species](#), which have essential functions but can also contribute to remodeling and enlargement of the heart.

In collaboration with Dean Jones, PhD, professor of medicine and director of the Emory Clinical Biomarkers laboratory, the researchers focused on cystine, the oxidized or used-up form of cysteine, a major antioxidant in the blood, whose presence can be measured readily.

"Our results suggest that increased oxidative stress promotes remodeling of the heart and enlargement of the left atrium, which can increase the likelihood of atrial fibrillation," Ghasemzadeh says. "Studies targeting oxidative stress markers may have a valuable effect in reducing atrial fibrillation risk."

Provided by Emory University

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