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Anger management: The key to staying heart healthy?

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New research published in the March 3, 2009, issue of the *Journal of the American College of Cardiology* finds that anger-induced electrical changes in the heart can predict future arrhythmias in patients with implantable cardioverter-defibrillators (ICDs).

While previous studies have demonstrated an increased incidence of sudden cardiac death during times of population stress such as earthquake and war, this study provides the first evidence that changes brought on by anger and other strong emotions can predict arrhythmias and may link mental stress to sudden cardiac arrest--which accounts for over 400,000 deaths each year.

"It's an important study because we are beginning to understand how anger and other types of mental stress can trigger potentially lethal ventricular arrhythmias, especially among patients with structural heart abnormalities," says Rachel Lampert, M.D., F.A.C.C., associate professor, Yale University School of Medicine.

Researchers studied 62 patients with ICDs who underwent monitoring during a mental stress test. Patients who had coronary artery disease or dilated cardiomyopathy (a condition in which the heart muscle are enlarged) and a standard indication for ICD were recruited from the Yale Electrophysiology practice. The mental stress test, conducted in a laboratory setting shortly after ICD implantation (about 3 months), asked patients to recall a recent situation in which they were angry or aggravated. T-wave alternans (TWA), a measure of the heart's electrical

stability, was analyzed during this test. Researchers then followed patients for a mean of 37 months to determine which had arrhythmias requiring termination by the ICD.

"We know strong emotion increases sympathetic arousal," says Dr. Lampert. "In this study, we found patients with higher levels of anger-induced TWA were more likely to experience arrhythmias requiring ICD termination."

Patients with ICD-terminated arrhythmias during follow up (16%) had higher TWA induced by anger compared with those patients who did not have future arrhythmias. Even when other clinical factors that predispose patients to higher TWA levels and/or higher risk of ventricular tachycardia/ventricular fibrillation were controlled for (e.g., heart failure or history of arrhythmia), anger-induced TWA remained a significant predictor of arrhythmias, which led to a heightened risk of up to ten times that of other patients.

The development of accurate, non-invasive risk stratification tests to identify those individuals at greatest risk for life-threatening arrhythmia is critical. The present study suggests that mental stress, namely anger, may be yet another pathway provoking arrhythmias.

"What remains unclear is how this new T-wave alternans test relates to traditional exercise TWA testing," according to Eric J. Rashba, M.D., professor of Medicine, Stony Brook University Medical Center. "It may be that combining exercise TWA tests with newer mental stress TWA tests may help clinicians better select patients likely to have arrhythmia and, in turn, benefit from a defibrillator; however, more study is needed."

In contrast to exercise, mental stress doesn't elevate one's heart rate much, suggesting that changes seen with mental stress may be due to a

direct effect of adrenaline on the heart cells. Therefore, mental stress testing could provide an alternative to atrial pacing for patients unable to exercise, according to Dr. Lampert.

"More research is needed, but these data suggest that therapies focused on helping patients deal with anger and other negative emotions may help reduce arrhythmias and, therefore, sudden cardiac death in certain patients."

Source: American College of Cardiology