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Cardiac MR sheds light on obscure heart muscle condition

Left ventricular non-compaction (LVNC), a cardiomyopathy about which little is fully understood, is associated with heart failure (HF), stroke and ventricular arrhythmias, according to a study to be presented Nov. 17 at the 2010 American Heart Association (AHA) Scientific Sessions in Chicago. The researchers also will report that advanced imaging technologies reveal that developing these cardiac risks appear to progress over time in patients with LVNC.

LVNC is an inherited heart muscle condition in which the muscular wall of the left ventricle appears to be spongy and non-compacted, consisting of a meshwork of numerous muscle bands (trabeculations). However, its cause, development, clinical course and treatment are the focus of ongoing research. As a result, the study authors said that the cardiology community's "understanding of the natural history of LVNC continues to evolve."

"Our ability to detect and recognize this condition has grown considerably over the past decade, as our imaging technologies have advanced," says study investigator William T. Katsiyannis, MD, director of the Genetic Arrhythmia Center and a clinical cardiac electrophysiologist at the Minneapolis Heart Institute® at Abbott Northwestern Hospital in Minneapolis. "Fifteen years ago, the main tool to examine cardiac muscle was echocardiography, which was not as sensitive as it is today. Now, with the advent of cardiac MR [magnetic resonance], we are able to see far more detail of the heart."

While the current incidence rate of LVNC is unknown, Katsiyannis hypothesizes that the condition may be far more common than has been previously postulated, due to a lack of diagnosis.

Previous data have indicated complications for patients with LVNC include stroke from blood clots that form in the non-compacted tissue, the development of heart failure or left ventricular dysfunction and the development of potentially dangerous ventricular arrhythmias.

To assess the association of LVNC with these traditional risk factors, the researchers assessed patients by echocardiography or cardiac MR, and diagnosed 125 patients with LVNC. Only 38.2 percent were diagnosed by echocardiography.

"The incidence rates are unclear because echo has been the gold standard," says Katsiyannis. "Echo missed the majority of patients with LVNC. Therefore, LVNC cannot be ruled out based on a normal echo."

The study's patient population had a higher than expected incidence of congestive heart failure (38.5 percent), left ventricular dysfunction with ejection fraction of less than 45 percent by cardiac MR (31.9 percent) and ventricular tachycardia (24.8 percent). In addition, the researchers at Minneapolis Heart Institute® reported that 3.1 percent of patients experienced stroke and 3.1 percent experienced sudden death.

Katsiyannis concludes that LVNC requires "much more research before clinical decisions are based on its diagnosis."

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