

Molecular imaging identifies high-risk patients with heart disease

August 10 2010

A study published in the August *Journal of Nuclear Medicine* (JNM) finds that molecular imaging—a non-invasive imaging procedure—can identify high-risk patients with potentially life-threatening cardiovascular conditions and help physicians determine which patients are best suited for implantable cardioverter defibrillator (ICD) therapy.

"If the [molecular imaging](#) techniques are used for appropriate selection of ICD candidates, not only overuse but also underuse of ICD could be avoided and the assessment may be shown to be more cost-effective," said Kimio Nishisato, M.D., a physician in the cardiology division of Muroram City General Hospital, Muroram, Japan, and corresponding author for the study.

According to researchers from Sapporo University, Sapporo, Japan, the study shows that molecular imaging can play an important role in diagnosing and guiding the treatment strategy for arrhythmia, [coronary artery disease](#) and [heart failure](#).

"This research holds significant potential for the detection, diagnosis and treatment of many common cardiovascular conditions," said Tomoaki Nakata, M.D., Ph.D., an associate professor at the Sapporo Medical University School of Medicine and director of the Hokkaido Prefectural Esashi Hospital, Japan. "With molecular imaging, physicians can improve patient care by pinpointing the precise location of the disease in order to eliminate the need for invasive medical devices and unnecessary surgical techniques." Nakata adds that molecular imaging can also

reduce unnecessary medical costs by better targeting treatment for each individual patient.

In this study, researchers hypothesized that both the impairment of myocardial perfusion and/or cell viability and cardiac sympathetic innervations are responsible for [heart arrhythmia](#) and sudden cardiac death. However, there was no established reliable method, including a molecular imaging technique which is highly objective, reproducible and quantitative. The researchers investigated prognostic implications of cardiac pre-synaptic sympathetic function quantified by cardiac MIBG activity and myocyte damage or viability quantified by cardiac tetrofosmin activity in patients treated with prophylactic use of ICD, by correlating with lethal arrhythmic events which would have been documented during a prospective follow-up. Based on these aspects, the study is the first to show the efficacies of the method for more accurate identification of patients at greater risk of lethal arrhythmias and sudden cardiac death (SCD).

"[Sudden cardiac death](#) due to lethal arrhythmia represents an important health care problem in many developed countries," said Ichiro Matsunari, M.D., Ph.D., director of the clinical research department at the Medical & Pharmacological Research Center Foundation, Hakui, Japan, and author of an invited perspective also published in the August JNM. "While implantable cardioverter defibrillator therapy is an effective option over anti-arrhythmic medications to prevent SCD, the balance of clinical benefits, efficacy and risks is still a matter of discussion."

Matsunari adds that better, more precise strategies such as the molecular imaging technique used in this study are needed to identify high-risk patients for SCD, who are most likely to benefit from ICD therapy. SCD is often the first manifestation of an underlying disease—but one that current treatments such as ICD cannot always detect. Molecular imaging

helps guide diagnosis and treatment as well as helps avoid unnecessary ICD treatment.

Provided by Society of Nuclear Medicine

Citation: Molecular imaging identifies high-risk patients with heart disease (2010, August 10)
retrieved 28 April 2024 from

<https://medicalxpress.com/news/2010-08-molecular-imaging-high-risk-patients-heart.html>

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