Sudden cardiac death in chronic heart failure: reduced EF vs preserved EF

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Sudden cardiac death (SCD) remains a major cause of cardiovascular mortality worldwide. It is estimated that SCD accounts for up to 15% of total mortality in industrialized countries and claims the lives of approximately 310 000 people per year in the United States. The majority of SCDs are caused by potentially treatable ventricular tachyarrhythmias (VT) including ventricular tachycardia and ventricular fibrillation. Unfortunately, in the majority of patients dying suddenly, death is the first symptom of the heart disease. Risk stratification and prevention of sudden death may therefore be of value in certain selected groups.

Heart failure (HF) represents the most common substrate for VT. Patients with depressed left ventricular ejection fraction (LVEF) are at significantly greater risk of SCD compared with those with a preserved LVEF. The electric instability caused by fibrosis and dilatation of the abnormal substrate is further triggered and exacerbated by sympathetic excitation in the presence of congestive HF. Presently, primary prevention of SCD relies on risk stratification based upon left ventricular ejection fraction (LVEF) and degree of congestive heart failure (CHF), followed by implantation of an ICD in patients with LVEF<35% and New York Heart Association Class II–III CHF. Although several clinical trials have demonstrated clear survival benefits conferred by this strategy, the greatest absolute number of SCD occurs in patients with preserved LVEF due to the much larger size of this population. It is becoming increasingly apparent that additional variables other than reduced LVEF may influence the risk of SCD and that LVEF alone is insufficient in determining which patients are most likely to benefit from prophylactic ICD implantation. A new risk stratification schema based on other non-invasive studies is clearly needed.

In the past decades, several new parameters based on non-invasive studies have been proposed to predict VT in patients with HF. However, no single risk parameter has been clinically applied in daily practice to guide to prevent SCD. This Is especially true for patients with preserved LVEF. Perhaps, certain algorithm incorporating a number of risk prediction parameters are the most promising way for clinical practice.