Predicting the future is always hard, and no more so than in a common disease like hypertrophic cardiomyopathy (HCM), which is usually associated with few if any symptoms yet can be a rare cause of sudden death in young people. For decades, the approach to the identification of individuals at high risk has been based on a semiquantitative estimation of relative risk derived from the summation of a small number of clinical markers. There are no prospective data on which to judge the clinical efficacy of this approach, but retrospective analyses suggest that it is only modestly predictive of future events. Similar dilemmas in other areas of medicine have been addressed with sophisticated risk models designed to estimate absolute risks. Until recently, the approach in HCM has been very different. Most investigators have Hunted for new and ever more sophisticated tools that provide a window into the complex substrate that causes ventricular arrhythmia. In this issue of Circulation, Chan et al present a study using cardiac magnetic resonance imaging (CMR) and suggest that it improves on current risk prediction methods. Specifically, they suggest that CMR assessment of late gadolinium enhancement (LGE) provides the following: a statistically stronger predictor of sudden cardiac death events than each of the individual conventional risk factors used in HCM; a “unique opportunity” to identify sudden cardiac death risk in asymptomatic HCM patients, previously thought to be at low risk for lethal ventricular tachyarrhythmias; and the ability to identify unrecognized high-risk patients who could potentially benefit from implantable cardioverter-defibrillator (ICD) therapy. Given the high stakes associated with the decision to implant an ICD in young and often otherwise healthy people, we must be sure that the data are robust enough to change clinical practice.

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(7%, 10%, and 11%), and the remaining 16 patients had LGE ≤5% of mass, which the authors acknowledge “...is trivial and does not differ significantly from that of patients without LGE.” From these data, LGE appears to have very limited utility in the identification of the very small number of individuals without risk factors who subsequently die suddenly. Close scrutiny of the data shows that the predictive power of LGE is generated from the cohort in which an appropriate ICD discharge is considered a sudden death event. The inclusion of ICD discharge events as equivalent to sudden cardiac death may have led to an overestimation of the sudden death rate, as has been shown in coronary artery disease and congestive heart failure studies. This cohort numbers only 17 patients, 13 of whom (77%) had conventional risk factors (6 with ≥2 risk factors). This is not a low-risk cohort, the apparent target population of this prognostic CMR study. Only 4 patients had no conventional risk factors (However, the Holter data are not presented; only the fact that they received a Holter is mentioned). Of these 4 patients, 3 had extensive LGE, and LGE may be adding value. Similarly, the patients with a single risk factor may receive added value from evaluation of LGE, but study design and size preclude this conclusion. There were insufficient analogous patients to enable analysis of the potential role for CMR to refine risk.

A major limitation of being a “prospective retrospective” study is the inevitable exclusion from analysis of 376 patients (23%) because of prior ICD implantation. The resultant cohort is enriched for low-risk patients and new patients undergoing preliminary or repeat risk stratification. This led to a low annual sudden death rate (0.5%) and, within the cohort who subsequently received ICDs, a low ICD discharge rate (0.4%). The low number of events affects statistical analysis in which the number of events limits the number of risk markers that can legitimately be evaluated. In this study, 4 conventional risk markers (syncope, adverse family history, nonsustained ventricular tachycardia, severe left ventricular hypertrophy) were collapsed into the analysis as a single continuous variable. The use of this statistical approach highlights the need for more robust data sets with larger numbers of events.

The authors conclude their article with the following: “Extensive LGE measured by quantitative contrast-enhanced CMR provides additional information for assessing sudden cardiac death event risk among HCM patients, particularly patients otherwise judged to be at low risk.” The data presented in the low-risk cohort without risk factors who nonetheless had events do not substantiate a special role for CMR in such patients. We look to future collaborations such as the HCMR: Novel Markers of Prognosis in Hypertrophic Cardiomyopathy study (a 5-year, prospective 2750-patient study) for further answers.17

Disclosures

None.

References


Cardiac Magnetic Resonance Imaging and Sudden Death Risk in Patients With Hypertrophic Cardiomyopathy
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