Letter to the Editor
European Journal of Heart Failure

Title

Microvolt T-wave alternans testing should be used to guide arrhythmic therapy in heart failure patients

Authors

Stefan H. Hohnloser, M.D.
Department of Cardiology
Division of Electrocardiology
J.W. Goethe University
Frankfurt, Germany

Richard J. Cohen, M.D., Ph.D.
Harvard-MIT Division of Health Sciences and Technology
Massachusetts Institute of Technology
Cambridge, Massachusetts
Email: rjcohen@mit.edu
Telephone: 617-253-7430
Fax: 617-253-3019
Jackson et al\textsuperscript{1} reported on a cohort of heart failure patients and concluded that microvolt T-wave alternans (MTWA) testing has limited utility in this population. Of note, this assessment was made in the complete absence of any outcomes data. The authors base their assessment on the fact that they deemed 318 of 648 patients to be ineligible for MTWA testing. The ineligibility was primarily attributable to the 38\% incidence of atrial fibrillation which they reported while noting that this incidence was substantially higher than the 23\% incidence reported in two earlier studies. Seventy-six patients were deemed ineligible for MTWA testing due to inability to exercise or continuous ventricular pacing. The authors ignored the availability of pharmacologic and pacing protocols to test this latter group of patients. Moreover, patients who cannot exercise on a treadmill often are able to elevate their heart rate adequately for MTWA testing (over 105 bpm) by means of isometric exercise or stepping in place.

The authors also reported a 46\% indeterminacy rate which is much higher than that reported for similar patients in recent studies (for example 12\%\textsuperscript{2} and 21\%\textsuperscript{3}). Of note, Jackson et al\textsuperscript{1} did not follow the recommended procedure of repeating the MTWA test in all patients who initially tested indeterminate, but repeated the test only in patients who were indeterminate due to excessive noise. Repeating the MTWA test in all patients who initially test indeterminate has been found to reduce the indeterminacy rate by 59\%\textsuperscript{4}. Of note, in the LVEF $\leq 35\%$ population, a properly conducted MTWA test with an indeterminate result confers at least as high a risk of sudden cardiac death as a positive test (see below).

While MTWA testing is not currently suitable for patients in atrial fibrillation, for the remaining patients with heart failure MTWA testing is a simple highly predictive non-invasive test. Merchant et al\textsuperscript{4} reported in a recent pooled analysis that of 1004 patients with ejection fraction $\leq 35\%$, 40\% tested positive, 21\% indeterminate, and 39\% negative. The corresponding annual rates of sudden cardiac death (SCD) were 4.0\%, 4.6\% and 0.9\%. No study has shown a benefit for ICD therapy in a population with an annual SCD rate anywhere close to 0.9\%. ICD implantation itself is associated with an in-hospital mortality of 1\% and a high rate of subsequent complications\textsuperscript{5}. Moreover, ICD therapy confers a mortality benefit only in patients with a non-negative MTWA result and not in patients with a negative result\textsuperscript{6}.

MTWA testing can be used as a reliable tool to guide arrhythmic therapy in heart failure patients.

**References**


