

Letters to the Editor

Microvolt T-Wave Alternans Testing in Defibrillator Implantation Decision-Making in Primary Prevention of Sudden Cardiac Death in Nonischemic Cardiomyopathy: Remarks After the DANISH Study



To the Editor:

Implantation of an implantable cardioverter defibrillator (ICD) for primary prevention of sudden cardiac death in patients with nonischemic cardiomyopathy (NICM) and New York Heart Association (NYHA) class II, III, or IV with cardiac resynchronization therapy (CRT) is a class Ia recommendation.¹ Current guidelines for ICD implantation in NICM are primarily based on the Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT) and Defibrillators in Non-ischemic Cardiomyopathy Treatment Evaluation (DEFINITE) trial,^{2,3} conducted before 2005. The Danish Study to Assess the Efficacy of ICDs in Patients with Non-ischemic Systolic Heart Failure on Mortality (DANISH), designed to assess the efficacy of ICD on mortality in patients with NICM,⁴ has generated discussion about these recommendations, because its results showed no all-cause mortality benefit of ICD therapy for primary prevention in patients with NICM and highlighted the importance of better risk stratification for ICD implantation. We hypothesized that the microvolt T-wave alternans (MTWA) test could stratify

sudden cardiac death risk and, as such, the benefit from ICDs in patients with NICM.

We obtained data from 2 European centers where MTWA testing was performed specifically because the purpose was to guide primary prevention ICD implantation (Supplemental Methods). The ratio of ICDs implanted in MTWA non-negative patients versus MTWA-negative patients was > 2:1, indicating that MTWA testing had a significant impact on the decision to implant an ICD. The pooled cohort included 198 patients (Supplemental Results) with NICM with a left ventricular ejection fraction (LVEF) of $\leq 40\%$: 140 MTWA non-negative patients and 58 MTWA-negative patients (Supplemental Table S1). Among MTWA non-negative patients, 68% underwent ICD (or CRT defibrillator) implantation, whereas only 31% of MTWA-negative patients received an ICD ($P < 0.001$). Despite a substantially lower prevalence of ICDs, the probability of long-term cardiac mortality (within a 46-month [24-70] follow-up period) was significantly lower in MTWA-negative patients (0%) than in MTWA non-negative patients (27.7%) (Fig. 1). LVEF, non-negative MTWA, and NYHA class III were significantly associated with cardiac mortality (hazard ratio [HR], 0.94; 95% confidence interval [CI], 0.88-0.99; $P < 0.024$; HR, 8.33; 95% CI, 1.12-62.07; $P < 0.039$; HR, 3.24; 95% CI, 1.32-8.00; $P < 0.010$, respectively). After adjusting for LVEF and NYHA class, a non-negative MTWA test result was a significant predictor of cardiac mortality (Supplemental Table S2). On the basis of our results, we conclude that

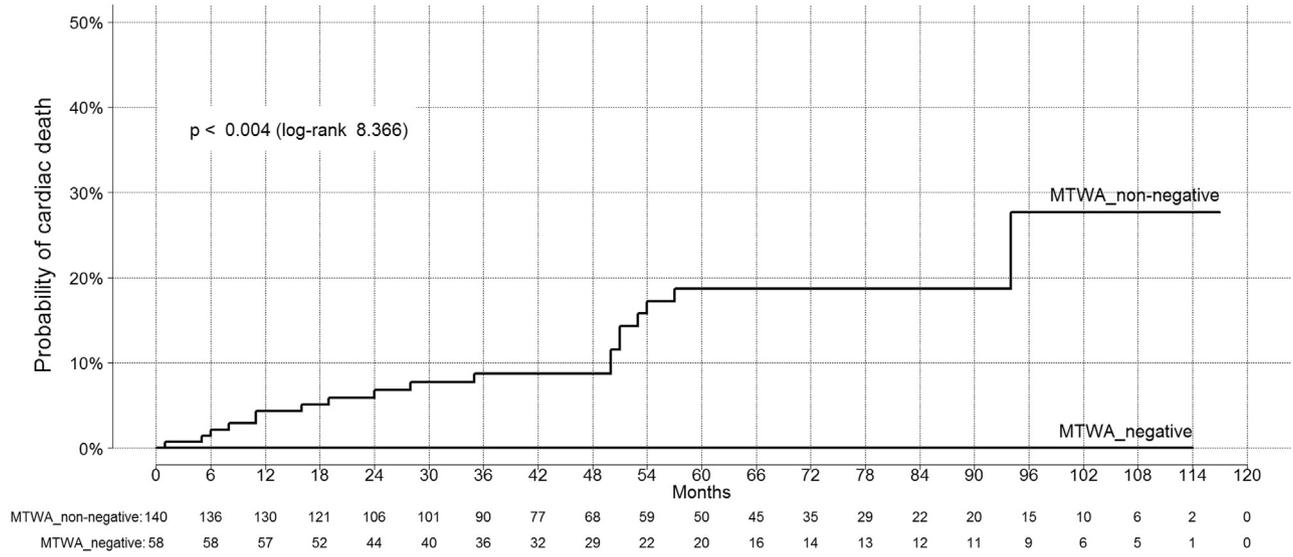


Figure 1. Kaplan–Meier curves illustrating probability of cardiac death during the follow-up period, stratified according to the microvolt T-wave alternans (MTWA) test result.

MTWA-negative patients with an LVEF of $\leq 40\%$ of non-ischemic cause had significantly better survival than MTWA non-negative patients, the majority of whom had ICDs. This seems to be helpful in the decision of whether to implant ICDs in patients with NICM.

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Disclosures

The authors have no conflicts of interest to disclose.

References

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Supplementary Material

To access the supplementary material accompanying this article, visit the online version of the *Canadian Journal of Cardiology* at www.onlinecjc.ca and at <https://doi.org/10.1016/j.cjca.2019.05.032>.