

Predictive Value of Microvolt T-Wave Alternans for Cardiac Death or Ventricular Tachyarrhythmic Events in Ischemic and Nonischemic Cardiomyopathy Patients: A Meta-Analysis

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Background: Microvolt T-wave alternans (MTWA) has been proposed as a predictor of the risk of ventricular tachyarrhythmias (VT) and sudden cardiac death (SCD). Aim of this study was to perform a systematic review of the literature and a meta-analysis of MTWA in primary prevention patients with ischemic and nonischemic cardiomyopathy.

Methods: The positive predictive value (PPV), negative predictive value (NPV), and relative risk (RR) of MTWA in predicting death, cardiac death, and SCD during follow-up were reported.

Results: Fifteen studies involving 5681 patients (mean age 62 years, mean ejection fraction 32%) were included. The summary PPV during the average 26-month follow-up was 14% (95% CI: 13–15); NPV was 95% (95% CI: 94–96), and the univariate RR was 2.35 (95% CI: 1.68–3.28). The predictive value of MTWA was similar in patients with ischemic and nonischemic cardiomyopathy. The average RR for SCD or VT events of an abnormal MTWA was 2.40, similar to that for cardiac death. When we grouped the studies together depending upon whether beta-blockers were withheld prior to MTWA screening, the beta-blockers group showed an RR of 5.88. By contrast, the group in which beta-blocker therapy was withheld had an RR of 1.63.

Conclusion: A positive MTWA determined an approximately 2.5-fold higher risk of cardiac death and life-threatening arrhythmia and showed a very high NPV both in ischemic and nonischemic patients. An abnormal MTWA test was associated with a 5-fold increased risk for cardiac mortality in the low-indeterminate group and about a 6-fold increased risk in beta-blockers group.

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T-wave alternans; cardiomyopathy; sudden death

Sudden cardiac death (SCD) due to ventricular tachyarrhythmias is a major public health problem. In recent years, there have been impressive advances in therapy for the prevention of SCD due to ventricular tachyarrhythmias. Specifically, the development of the implantable cardioverter/defibrillator (ICD) has provided effective and specific preventive treatment for patients known to be at high risk of SCD.^{1–4} However, ICD therapy is expen-

sive and not without complications for the patient. Until recently, advances in therapeutic modalities have not been paralleled by advances in noninvasive diagnostic technologies to identify high-risk patients. Ideally, effective noninvasive diagnostic methods would identify those patients at increased risk of SCD, and then be used to guide prophylactic treatment. Current strategies for the identification of high-risk patients mainly involve the detection of

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