

# Microvolt T-wave alternans predicts cardiac events after acute myocardial infarction in patients treated with primary percutaneous coronary intervention

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## ABSTRACT

**Background:** Current risk stratification after acute myocardial infarction (MI) depends on left ventricular ejection fraction. Microvolt T-wave alternans (MTWA) is one of promising markers to predict cardiac events in patients after acute MI treated according to current guidelines.

**Methods:** In this single center study, 112 consecutive patients with the first anterior ST-elevation MI undergoing PCI <12 hours from symptom onset, were enrolled prospectively. Demographics, established risk factors, myocardial contrast echocardiography (MCE) perfusion, index event data and MTWA were assessed. Composite cardiac events (CCE) defined as: death, recurrent MI, sustained ventricular tachycardia (sVT) or readmission for acute heart failure (HF) were recorded during follow-up.

**Results:** MTWA test was negative in 76, positive in 18 and undetermined in 7 patients. MTWA negative patients had significantly higher LVEF at 30 days. At 4 years, 26 patients experienced CCE (10 died, 2 reinfarcted and 14 HF events). In multivariate Cox proportional hazard model maximum CKMB, non-negative MTWA and reduced LVEF made the best model to predict CCE. Four year CCE free survival was 77% and was significantly lower for non-negative MTWA (94% vs 50%,  $p < 0.003$ ).

**Conclusions:** Non-negative MTWA with infarct size index and reduced LVEF could predict cardiac events in patients with anterior STEMI treated with primary PCI. MTWA non-negative patients have significantly worse outcome.

**Key words:** T-wave alternans, myocardial infarction, cardiac events, prognosis

## INTRODUCTION

Patients after acute myocardial infarction (MI) have relatively high mortality during the first 12 months, in half of cases the death is sudden, predominantly arrhythmic [1]. One of the most widely used stratifier with established value is depressed left ventricular ejection fraction (LVEF) [2]. Many other noninvasive stratifiers have been used to assess prognosis after MI, but their positive predictive values are low and therefore

search for new markers for survival is still being conducted. Pharmacotherapy with beta-blocking agents, angiotensin converting enzyme inhibitors and statins have been proved to improve survival. In addition, use of primary percutaneous coronary interventions (PCI) with stent implantation also could influence the value of some stratifiers.

Microvolt T-wave alternans (MTWA) has been proposed as a potential indicator of susceptibility to ventricular tachycardia/fibrillation in several groups of patients, equivalent to electrophysiological study [3,4]. Occurrence of