

Microvolt T-wave alternans testing and risk of death in patients with & without ICDs

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Introduction

- Many patients implanted with primary prevention implantable-cardioverter defibrillators (ICDs) never receive appropriate device therapy. Better risk stratification tools are needed to identify patients who are most or least likely to benefit from ICDs
- Prior studies have suggested that patients with negative microvolt T-wave alternans (MTWA) test results are at such low risk of sudden cardiac death (SCD) that they may not benefit from ICDs ^{1, 2}

Methods

- Patient-level data were gathered from 10 European & Japanese centers where MTWA testing was performed specifically for the purpose of making decisions about primary prevention ICD implantation. Eligible patients included those with left ventricle ejection fraction (LVEF) ≤ 40% and no documented history of ventricular arrhythmias
- Centers were included if the ratio of ICDs implanted in patients who were MTWA “non-negative” (i.e. positive or indeterminate) to patients who were MTWA negative was > 2:1, suggesting that MTWA testing had a significant impact on the decision for ICD implantation. The ultimate decision to implant or not implant an ICD in any given patient was left to the discretion of the treating physician
- From the original 10 centers, two cohorts comprising a total of 167 patients were excluded because the ratio of ICDs implanted in non-negative to negative patients was not >2:1
- The primary endpoint was all-cause mortality at 24 months and the secondary endpoint was arrhythmic/sudden cardiac death at 24 months
- Kaplan-Meier time to first event curves and product-limit estimates were tested with the log-rank test

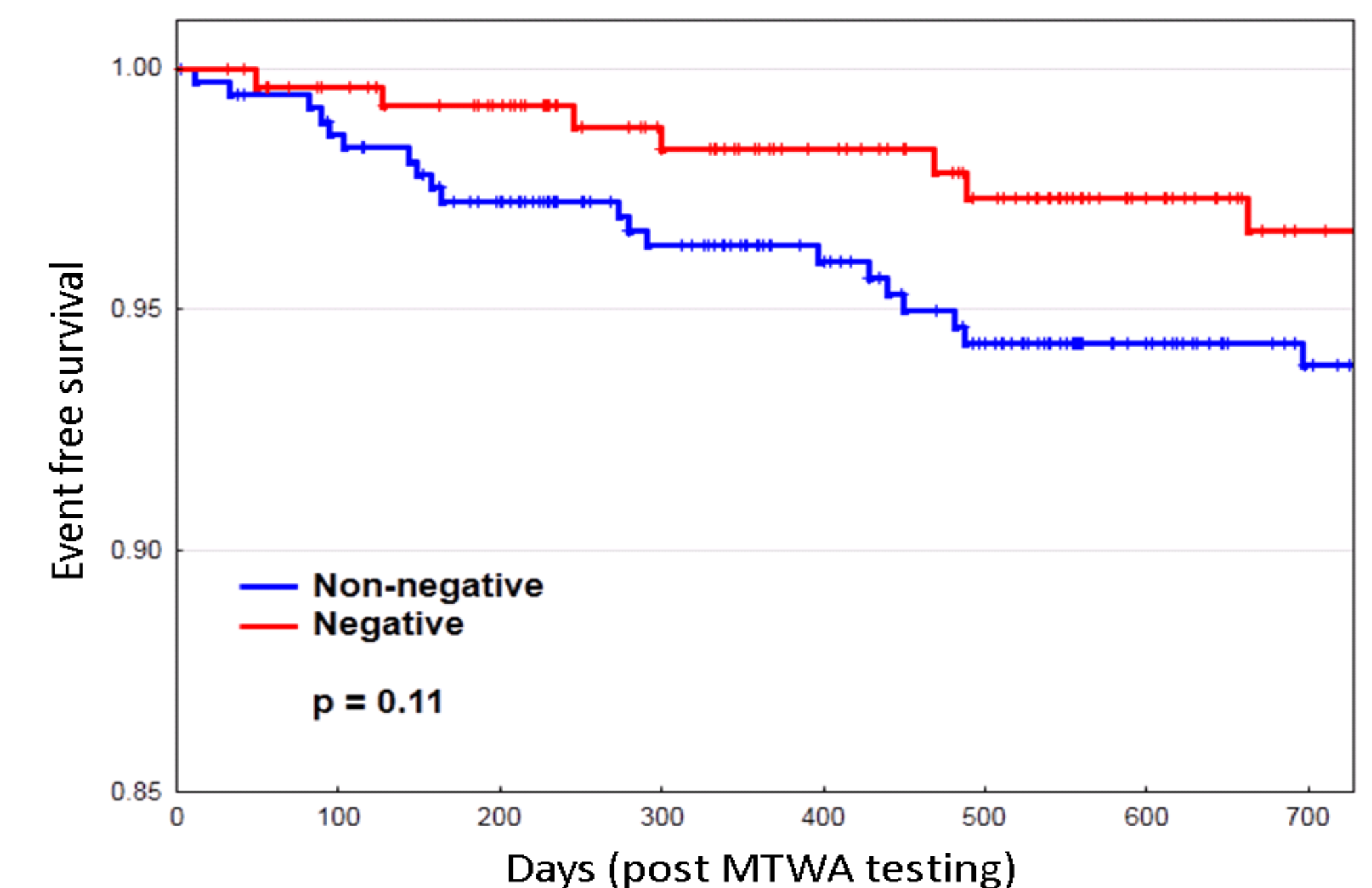
Results

- The final study cohort included 651 patients pooled from 8 centers. Baseline characteristics:

	Non-negatives (n=371)	Negatives (n=280)	p
Age (years)	63.1 ± 11.4	61.8 ± 10.7	0.05
Gender (male)	316 (85%)	231 (83%)	0.39
Left ventricle ejection fraction	30.6 ± 6.7	33.2 ± 5.8	<0.01
Coronary artery disease	208 (56%)	195 (70%)	<0.01
Implantable cardioverter-defibrillator	231 (62%)	37 (13%)	<0.01
Medical therapy			
Beta Blockers	296 (80%)	219 (78%)	0.63
ACE inhibitors/ARBs	310 (84%)	228 (81%)	0.53
Diuretics	286 (77%)	163 (58%)	<0.01
MTWA positive	257 (69%)		
MTWA indeterminate	114 (31%)		

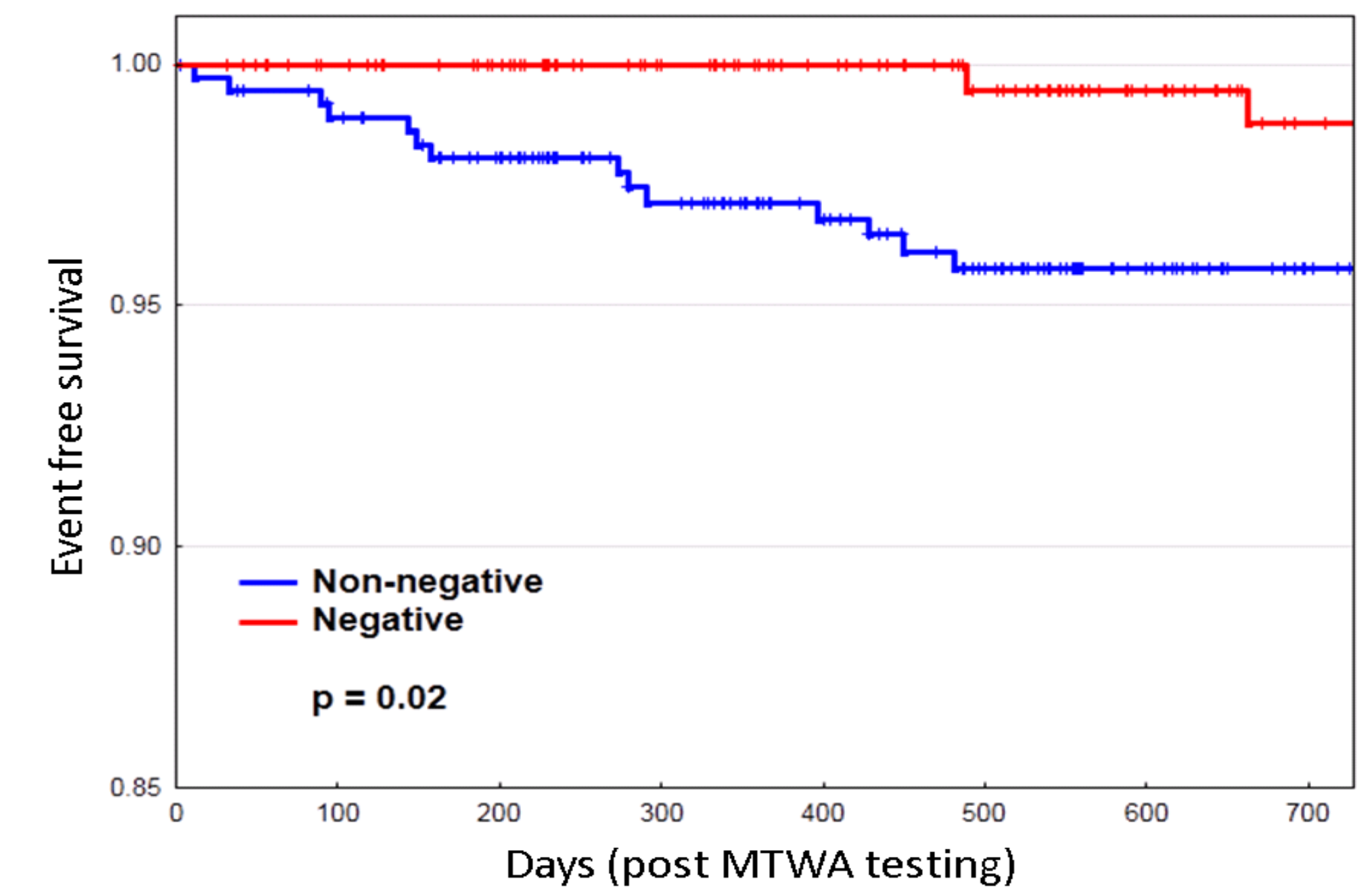
Data are presented as mean ± standard deviation or n (%)

- Despite a significantly higher percentage of ICDs in non-negative vs. negative patients (62% vs. 13%), all-cause mortality at 24 months was better among MTWA negative patients and not significantly different than the non-negative group (96.6% vs. 93.8%, p = 0.11):



Results

- Similarly, despite a significantly lower percentage of ICDs, survival free of arrhythmic/sudden cardiac death was significantly better among negative MTWA patients (98.7% vs. 95.8%, p = 0.02):



- Likely due to limited statistical power in the subgroups, there were no significant differences in the frequency of the primary or secondary endpoint in either the MTWA non-negative or negative groups when stratified by ICD status:

	MTWA non-negative (371)		p	MTWA negative (280)		p
	ICD (231)	no ICD (140)		ICD (37)	no ICD (243)	
All-cause mortality (%)	5.2	7.9	0.34	5.7	3.1	0.29
Arrhythmic/sudden death (%)	4.2	4.0	0.94	0	1.5	0.49

Two year event rates are presented, stratified by MTWA and ICD status. Number of patients in each group are presented in parentheses.

Conclusions

- We present the first multi-center data in which MTWA was prospectively used to guide ICD implantation
- In this large, real-world cohort, despite a very low prevalence of ICDs, patients with negative MTWA test results experienced very low rates of all-cause (3.4%) and arrhythmic/sudden cardiac (1.3%) death at 2 years. No studies to date have demonstrated a mortality benefit to ICDs in patients with such low event rates ³
- MTWA non-negative patient, a majority of whom received ICDs, compared with the MTWA negative patients, had numerically greater all-cause mortality and a statistically significantly greater rate of arrhythmic/sudden cardiac death
- These findings provide further evidence that MTWA negative patients do not benefit from primary prevention ICD therapy

References

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Disclosures

Richard J. Cohen (Cambridge Heart Inc., significant)