

ORIGINAL ARTICLES

Microvolt T-Wave Alternans as Predictor of Electrophysiological Testing Results in Professional Competitive Athletes

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Background: Several studies have confirmed the equivalence of the microvolt T-Wave alternans (mTWA) and the electrophysiology (EPS) tests in cardiac disease. No data are available in populations of competitive athletes with arrhythmias that might jeopardize the pursuit of their professional career.

Methods: We prospectively studied 100 trained competitive athletes, including elite types (72/100), (mean age \pm standard deviation: 26.1 ± 4.5 years). Forty-eight of them were wholly normal (Group A, mean age: 24.5 ± 8.5 years) and 52 of them had severe arrhythmias (Group B, mean age: 28.2 ± 11.5 years) and were symptomatic in 85% of cases for prolonged palpitations and syncope, but lacked any overt structural heart disease at standardized cardiological screening.

All athletes were evaluated with the microvolt T-wave alternans exercise–stress test, using the Heart Wave System with Microvolt Sensors. Group B underwent EPS to evaluate inducibility to sustained ventricular tachycardia (VT) during programmed electrical stimulation.

Results: In Group A, the mTWA outcome was determinate in 45 subjects (94%) and indeterminate in 3 (6%). No symptomatic event was reported in a follow-up of 36.1 months. In Group B, the mTWA test was positive in 7 symptomatic subjects (15%), indeterminate in 3 (7%), and negative for the remaining 42 subjects (76%). Forty-one of 42 negative mTWA subjects were also negative in the EPS test, without any syncope or sustained VT during 25.3 months of follow-up. In the positive mTWA test subjects, 5 (72%) were positive for inducibility of rapid sustained monomorphic VT in EPS, 1 was positive for severe sustained atrial tachyarrhythmias, and 1 refused EPS. We were able to pronounce a correct diagnosis of lymphocytic myocarditis for only 1 mTWA and EPS-positive subject. For the other 4 positive patients with arrhythmogenic micropathology, severe arrhythmic events were revealed in the follow-up and aggressive hybrid treatment was necessary.

Conclusion: Microvolt-TWA study seems to be a useful, noninvasive, and feasible tool for evaluating arrhythmic risk in the athletic population. The mTWA test showed a high negative predictive value, using both EPS and the follow-up observation for severe arrhythmic cardiac events as an endpoint. The positive predictive value was present in a limited number of cases that were, however, subjects with a high risk of sudden arrhythmic death. **A.N.E. 2004;9(3):1–6**