

MICROVOLT T WAVE ALTERNANS DURING ATRIAL AND VENTRICULAR PACING

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Introduction: Microvolt T–Wave alternans (MTWA) has demonstrated value in assessing risk of sudden death. To evaluate MTWA, exercise testing or atrial pacing (AP) are used. We hypothesized that despite altered repolarization due to ventricular pacing (VP), VP could be utilized to assess MTWA. We compared results of MTWA obtained by AP and VP.

Methods: Patients (pts) underwent AP and VP in random order. Medications were continued at time of testing. Pacing was at a fixed rate of 550msec in both chambers. Spectral analysis of MTWA was completed by commercially available tools (Cambridge Heart, USA). Results were assessed as negative (N) or nonnegative (NN) which included positive and indeterminate results. Maximum amplitude of MTWA (Mv) in concordant positive results, as well as noise levels in all, were compared in both pacing modes.

Results: 42 consecutive pts were evaluated, of whom 31 completed both tests. AP was not possible in 10 pts (24%) due to atrioventricular block (7) or atrial fibrillation (3). VP was not possible in 2 (5%) with frequent ectopy.

All patients were male, aged 66.7 ± 10.8 years. Ejection fraction was $32.8 \pm 12.6\%$ with coronary artery disease in 76%. Pts were on betablockers (76%), ACE–I (79%), digoxin (23%) and amiodarone (12%) at time of testing. AP was N in 17 pts (53%) and NN in 15 (47%), while VP was N in 16 (40%) and NN in 24 (60%). Twenty five (80%) of 31 paired tests were concordant indicating good agreement between both tests ($k = 0.62$, $p < 0.001$). VP had a better negative than positive predictive value (NPV 92% vs PPV 72%) and was more sensitive (93%) than specific (71%) when referenced to AP. There were no differences in clinical variables between pts with concordant or nonconcordant tests other than amiodarone use which was more likely in nonconcordants ($p = 0.02$). Mv from both tests had significant positive correlation ($r = 0.63$, $p = 0.05$) with a trend toward higher values of Mv by VP (10.7 ± 5.3 vs 7.8 ± 3.9 , $p = 0.058$). VP noise was significantly higher (1.4 ± 0.8 vs 1 ± 0.8 , $p < 0.01$).

Conclusion: Despite overall agreement between results of VP and AP, VP appears to generate higher levels of Mv and noise with higher percentage of NN results. New cutoffs for positive VP may need to be established.