Assessment of Microvolt T Wave Alternans on and off 21% 44.5 ±16 0.0008 0.0001

Do Randomized Trials Affect Clinical Practice? AFFIRM, 97 92 13 bpm to 107+

Hypertensive Stress Enhances Repolarization 0.3 0 1

Cardioversion in Patients With Dense Spontaneous 0.356 53 ±3

Methods: Consecutive patients scheduled for ICD implantation underwent noninvasive MTWA assessment using bicycle exercise testing (spectral method; CH2000, Cambridge Heart Inc) on and off BB treatment in random order. Antidrenergic therapy was withheld for at least 5 half lives prior to the test off BB. Results of MTWA tests were compared using Fisher’s exact test. Separate analysis was performed in a subgroup of patients who were on chronic amiodarone treatment.

Results: 9 patients were included in the protocol. Of these, 17 were treated with amiodarone. Patients on BB had a resting heart rate of 71±10 bpm compared to 79±10 bpm of BB (p<0.05). The maximal exercise heart rate averaged 102±13 bpm to 107±13 bpm of BB (p<0.05). Whereas 13 pts (27%) tested MTWA positive on BB, the positivity rate was 47% (23 test off BB therapy (p<0.05).The prevalence of an indeterminate test result decreased from 41% to 24% (p<0.09). In the subgroup of patients with amiodarone, no patient tested MTWA positive, irrespective of the status of BB therapy. The proportion of indeterminate tests was 88% on and 82% off BB therapy exclusively due to chronotropic incompetence during testing.

Conclusion: MTWA assessment is facilitated by withholding BB prior to testing by reducing the prevalence of indeterminate tests as a consequence of insufficient heart rate increase. Chronic amiodarone therapy results in chronotropic incompetence in almost all patients which precludes exercise-based MTWA assessment.

Hypertensive Stress Enhances Repolarization Heterogeneity

Bart Haast and van Huysduynen, Cees A. Swenne, Henk J. Ritsema van Eck, Anna L. Schoneveld, Hedde van de Vooren, Jan A. Kors, Piet Schiereck, Martin J. Schalij, Ernst E. van der Wall, Leiden University Medical Center, Leiden, The Netherlands, Erasmus University Rotterdam, Rotterdam, The Netherlands

Purpose: Several electrocardiographic indexes for heterogeneity of cardiac repolarization have been put forward: the QT interval, the QT-dispersion, the Tapex-Tend interval and the Tapex-Tend amplitude as a measure of the complexity of the T wave. Some postulate that the duration of longest action potentials are measured in the U wave. We studied the behavior of these alternative indexes under three different conditions; rest (R), normotensive gravitational stress (NORM) and hypertensive isometric stress (HYP). The main objective of this study was to evaluate the difference of the Tapex-Tend interval and blood pressure were recorded during R (sitting with horizontal legs), NORM (sitting with lowered legs at increasing angles) and HYP (sitting with horizontal legs while performing a 3-minute handgrip at 30% of the maximal force). In each volunteer a leg-towinging angle was recorded for each condition and the heart rate differed less than 10 % from the heart rate during handgrip. This succeeded in 41 subjects, who constituted the final study group.

Results: Heart rate increased from 63 + 9 during R to 71 + 11 bpm during both NORM and HYP. Systolic blood pressure was 122 ± 15 in R, remained 121 ± 15 during NORM and increased to 151 ± 17 mmHg during HYP. QT and QTc were larger during HYP (405 ± 27 and 433 ± 17 ms) than during NORM (389 ± 26 and 421 ± 18 ms, P<0.001). QT dispersion did not differ significantly between HYP (51 ± 26 ms) and NORM (45 ± 22 ms, NS). The Tapex-Tend interval in V2 was larger during HYP (125 ± 18 ms) than during NORM (117 ± 15 ms, P<0.001). The distance between the apices of the T and U wave was significantly larger during HYP (191 ± 44 ms) than during NORM (158 ± 36, P<0.001). Fixed and moving window singular value decomposition indexes were larger during HYP (0.14 ± 0.071 and 0.075 ± 0.032) than during NORM (0.089 ± 0.053 and 0.048 ± 0.022, P<0.001).

Conclusion: Most measures put forward as indexes of repolarization heterogeneity were larger during hypertensive stress than during normotensive stress. Hypertensive stresses, like mental stress, are associated with arrhythmogeneity in vulnerable hearts. Our study provides one possible explanation for this, because hypertensive stress enhances repolarization heterogeneity.

Optimal Prognostication From the 12-Lead ECG: Spatial Angle Between the QRS and T Wave Complexes

Takuya Yamazaki, Greg Engel, Clinton Watt, Jonathan Myers, Sung Chun, Victor F. Froelicher, VA Palo Alto Health Care System, Stanford University, Palo Alto, CA

Objective: To evaluate the prognostic value of a new criterion that combines measurements from repolarization and depolarization by considering the orientation of the QRS and T axis.

Methods: Analyses were performed on the first ECG digitally recorded on 46,950 consecutive patients at the Palo Alto Veterans Affairs Medical Center since 1987. Females and patients with paced rhythms, WPW, BBs, IVCD, LVH, atrial fibrillation and diagnostic Q waves were excluded from all analysis, leaving 31,074 patients with a mean age of 56 years. Using computerized trigonometric algorithms, spatial QRS, T axis and T lambda (the spatial Taxis deviation from normal reference direction) were synthesized by deriving X12 leads from the 12 leads using the inverse Dower weighting matrix and similarly by using the unadjusted amplitudes from leads I, aVF and V2. Spatial QRS-T angle was categorized into three groups: normal (0 to 50°), borderline (50 to 100°) and abnor-

ORAL CONTRIBUTIONS

Cardioversion in Patients With Dense Spontaneous Echo Contrast

Faisal O. Alatawi, Joseph Malouf, Chandrasekaran Krishnaswarmy, Saeed A. Al Ahmari, Brenda S. Moore, Charles J. Bruce, Naser A. Ammass, Mayo Clinic, Rochester, MN

Background: Dense spontaneous echo contrast (SEC) in left atrial appendage is associated with increased risk of thrombus formation. The risk of thromboembolism (TE) following electrical cardioversion is yet to be determined.

Methods: 133 patients (pts) mean age 72 ± 10 years, male 76.7% with non rheumatic atrial fibrillation (AF) 74%) or atrial flutter (FL) 26%, without mitral valve disease scheduled for Transesophageal Echocardiogram guided cardioversion between May 2000 to May 2003, were noted to have SEC. The SEC was described as less than mild in 75 pts (56.4% (group 1), severe in 58 pts (44.6%) group 2. The success and complication rates following cardioversion were analyzed.

Results: Both groups were similar with respect to age, gender, diabetes, hypertension and rhythm. Univariate comparative analysis is summarized in the table below.

<table>
<thead>
<tr>
<th>covariate</th>
<th>Group1 (n=75)</th>
<th>Group2 (n=58)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF / FL</td>
<td>63 / 22</td>
<td>46 / 12</td>
<td>0.3</td>
</tr>
<tr>
<td>History of TE (%)</td>
<td>5 / 7</td>
<td>7 / 7</td>
<td>0.009</td>
</tr>
<tr>
<td>History of congestive heart failure %</td>
<td>21% / 52%</td>
<td>52% / 52%</td>
<td>0.0001</td>
</tr>
<tr>
<td>LVEF(mean ±sd0)</td>
<td>53 ±13</td>
<td>44.5 ±16</td>
<td>0.0008</td>
</tr>
<tr>
<td>Left atrial appendage emptying velocity (average of peak for 5 cycles) cm/s</td>
<td>46±16 (30±40)</td>
<td>17±10 (10–24)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Successful cardioversion %</td>
<td>97 / 97</td>
<td>92 / 92</td>
<td>0.19</td>
</tr>
<tr>
<td>Post cardioversion thromboembolic events/n</td>
<td>0 / 0</td>
<td>0.368</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: Dense spontaneous echo contrast in the left atrial appendage with very low LAA emptying velocity should not preclude from external biphasic electrical cardioversion. Dense spontaneous echo contrast carries similar success rate and thromboembolic risk as those with mild or less spontaneous echo contrast and high LAA emptying velocity.

Do Randomized Trials Affect Clinical Practice? AFFIRM, RACE, and the Management of Atrial Fibrillation

Pamela K. Mason, Mark A. Wood, Douglas Lake, John P. DiMarco, University of Virginia Health System, Charlottesville, VA, Medical College of Virginia, Richmond, VA

The impact of trials on clinical practice is often delayed. In 3/2002, the results of 2 randomized trials (AFFIRM and RACE) comparing rate control and rhythm control strategies in patients with atrial fibrillation (AF) were presented. Both studies reported no benefit with a rhythm control strategy with trends favoring a rate control approach. We hypothesized that these data would result in changes in clinical practice: a decrease in elective cardioversions and an increase in ativoventricular junctional (AVJ) ablation in patients with AF. At the University of Virginia Health System, Charlottesville, VA and the Medical College of Virginia, Richmond, VA, we compared the number of elective cardioversions and AVJ ablations performed during the 52 months prior to the release of the AFFIRM and RACE trial data to the numbers performed during the 14 months after their release. There was a decrease in cardioversion frequency after the trials were presented. Between 1/1998 and 3/2002, an average of 31 elective cardioversions were performed each month, whereas between 4/2002 and 6/2003, 23 cardioversions were performed...