Conclusion: In post-MI patients receiving an up-to-date treatment Turbulence Onset and Turbulence Slope are superior to other established parameters of heart rate variability.

1213-7 Anatomical Basis of P Wave Duration Dispersion for the Prediction of the Development of Atrial Fibillation After Cardiac Surgery

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Background: Atrial fibrillation (AF) is a common arrhythmia in clinical practice, and occurs frequently after cardiac surgery. Previous studies have described greater dispersion of P wave duration (P-disp) in patients (pts) with a history of AF. However, it is possible that patients with AF may have different factors that contribute to the dispersion of P wave duration. The purpose of this study is to evaluate prospectively whether P-disp could predict the AF development after cardiac surgery and to elucidate the pathophysiology of P-disp from the viewpoint of atrial fibrosis.

Methods: We studied 30 consecutive pts undergoing cardiac surgery. Before the surgery, P wave signal-averaged ECG was recorded from standard 12 leads and 10 extracardiocordial leads (two intercostal spaces upper and lower V1, V2 and V4-6). P-disp was defined as the difference between the maximum and minimum of filtered P wave duration in all the leads. Abnormal P-disp was defined as more than 20 ms, mean+2SD of P-disp of all pts at each hour during a day were analyzed and compared. Whether QTd has circadian variation is still not well established. Using 12-lead Halter ECG recording by digital screen are recorded at each hour from 6:00 AM to 10:00 PM in patients without coronary artery disease has circadian variation. During a day, the QTd of early morning period (AM 2:00 to 6:00) are longer than that of the rest of a day.

Results: The total of 720 value of QTd were analyzed. The average mean QTd for all 30 hour was measured manually from the 12-lead Halter ECG recording by digital screen are recorded at each hour from 6:00 AM to 10:00 PM in patients without coronary artery disease. Atrial fibrillation might play a role in the genesis of greater P-disp in patients with AF.

1213-8 Rest Redefining Imaging: A Novel Standard for Assessing ECG Criteria for Myocardial Infarction

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Background: Few studies have tested the assumption that an abnormal Q wave reflects prior myocardial infarction (MI). Our previous work using resting myocardial scintigraphy (MS) to identify MI found Q and QS criteria of the Minnesota Code (MC) had a sensitivity of 0.58 and a positive predictive value of 0.53. Concerned that a resting defect might reflect intense ischemia rather than MI and thus be responsible for false negative ECG findings, we tested the accuracy of ECG criteria to detect MI against a redistribution MS obtained as part of a viability study 4 hours after a resting injection.

Methods: Redistribution images from 31 consecutive pts were scored by an experienced nuclear cardiologist using the Sym Stress Score. The presence of any defect on the rest and redistribution MS was taken as evidence of prior MI. Two experienced readers each evaluated contemporaneous ECGs using the MC and Sylvester Score (SS), and then compared the sensitivity of both systems to detect MI.

Results: Of 20 pts with defects, 16 (80%) were identified by the SS and 13 (65%) by the MC. Of the 11 pts with no defect, 10 (91%) were erroneously identified by SS as having had MI as well. Mean age was 67.7±17.9 years, mean EF was 0.39±0.17, and mean QRS duration was 112.9±38 ms. QRS duration ≥120 ms was present in 16 (23.7%) patients. ECG of CHF was ischemic in 46% (all with nonischemic in 223 (30%), Age, EF, and an ischemic cause of CHF were found to correlate with QRS duration (correlation coefficient R=0.15, 0.20 and 0.17, respectively, p<0.001 for all). The table shows the risk factors for a substantially prolonged QRS (≥130 ms) by multiple logistic regression. Table. Risk factors for QRS duration ≥130 ms.

Conclusion: The sensitivity of MC criteria was minimally improved when compared to SS criteria (1.1) were met.

1213-9 Circadian Variation of QT Dispersion Determined by Twelve-Lead Holter Electrocardiography in Patients Without Coronary Artery Disease

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Background: Increase of QT dispersion (QTd) was associated with cardiac events. The onset of some cardiac events was reported to have higher frequency in early morning. Whether QTd has circadian variation is still not well established. Using 12-lead Holter electrocardiography (ECG), we will determine circadian variation of QTd in patients without coronary artery disease.

Methods: Thirty patients (16 male, 14 female, mean age 54±12 years) were enrolled to this study. Normal coronary angiography was confirmed by cardiac catheterization. The 12-lead Holter ECG recording was performed in each patient for 24 hours. The QT interval at each hour was measured manually from the 12-lead Holter ECG recording by digital screen caliper, and the QTd for each patient was calculated. The mean QTd for all patients at each hour during a day was analyzed and compared.

Results: The total of 720 value of QTd were analyzed. The average mean QTd for all 30 patients in 24 hours was 46.49±10.40 ms. The QTd of patients without coronary artery disease has circadian variation. During a day, the QTd of morning period (AM 2:00 to 6:00) are longer than that of the rest of a night.

Conclusion: The QTd of patients without coronary artery disease has circadian variation. During a day, the QTd of morning period (AM 2:00 to 6:00) are longer than that of the rest of a day.

1213-10 Correlation Between QRS Duration and Ejection Fraction Among 679 Patients With Ejection Fraction ≤40 and Congestive Heart Failure

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Background: Electrocardiographic abnormalities are common among patients with congestive heart failure (CHF). We sought to determine whether QRS duration correlates with ejection fraction (EF) in patients with left ventricular systolic dysfunction.

Methods: We reviewed the demographics, etiology of systolic dysfunction, and electrocardiograms of patients with EF ≤40 and symptomatic CHF who were enrolled in our CHF care management program. The relationship between QRS duration and EF was examined. Risk factors for substantial QRS prolongation (≥130 ms) were identified by multiple logistic regression.

Results: A total of 679 patients (65% male) were included in this analysis. Mean age was 67.7±17.9 years, mean EF was 0.39±0.17, and mean QRS duration was 112.9±38 ms. QRS duration ≥120 ms was present in 16 (23.7%) patients. ECG of CHF was ischemic in 46% (all with nonischemic in 223 (30%), Age, EF, and an ischemic cause of CHF were found to correlate with QRS duration (correlation coefficient R=0.15, 0.20 and 0.17, respectively, p<0.001 for all). The table shows the risk factors for a substantially prolonged Q (≥130 ms) by multiple logistic regression. Table. Risk factors for QRS duration ≥130 ms.

Conclusion: Among patients with EF ≤40, age and EF independently correlated with QRS duration. The adjusted odds ratio for developing a prolonged QRS (≥130 ms) was 1.03 for every year increase in age and 1.03 for every percent decrease in EF.

1213-11 QRS Duration is Associated With Abnormalities in Cardiac Structure and Function

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Background: In small cohort studies, pathologic prolongation of the QRS interval, as evidenced by LBBB, has been associated with abnormalities in cardiac structure and function; however, little data is available regarding QRS duration and its relationship to LV mass and systolic function.

Methods: We collected data from ECGs and echocardiograms in 8,758 patients to determine the relationship between QRS duration and incidence of left ventricular mass and systolic function. Left ventricular hypertrophy was defined as a LVMi>104 g/m2 in women and >116 g/m2 in men. Systolic dysfunction was defined as an ejection fraction (EF) <50% as determined by echocardiography.

Results: (See table; *p<0.0001 compared with QRS <100, †p<0.0001 compared with QRS 100-200) QRS duration correlated directly with LV mass (r=0.40; p<0.0001) and inversely with EF (r=-0.36; p<0.0001).

Conclusion: QRS duration by routine ECG correlates significantly with LV mass and measurements of systolic function. Although QRS duration ≥120 msec are generally considered to be associated with cardiac abnormalities, borderline QRS duration (100-120 msec) were associated with a 2.5 fold increased prevalence of LVH and systolic dysfunction compared to patients with QRS duration <100 msec.

Table. Risk factors for QRS duration ≥130ms.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.03</td>
<td>1.02-1.05</td>
</tr>
<tr>
<td>EF</td>
<td>1.03</td>
<td>1.01-1.06</td>
</tr>
<tr>
<td>Left bundle branch block</td>
<td>1.03</td>
<td>0.72-2.16</td>
</tr>
<tr>
<td>Presence of LVH</td>
<td>6.0%</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Systolic Dysfunction 7.6% 21.0% 39.8%