Evolution of ECG changes in Tako Tsubo Cardiomyopathy: arrhythmias first, QT prolongation later?

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The commencement of the Holter. The remaining 24 h was analysed by 12 lead Holter using established morphologies for LV, RV and BiV pacing at twice the chronic threshold. Programming lead outputs minimally above capture threshold for LV lead outputs on LV capture percentages. Patients with LV leads implanted for >4 weeks and 18 (82%) ECGs at 24 h (1) Irrespective of the presenting ECG, most patients with TTC develop widespread T wave inversion and QTc prolongation approximately 24 h post-presentation. (2) Although TTC is associated with a substantial risk of development of TdF, this often occurs before evolution of QTc prolongation. The relationship between ECG changes and intramyocardial inflammatory response in TTC needs further study.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Admission ECG</th>
<th>24 h ECG</th>
<th>48 h ECG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean QTc (ms)</td>
<td>484.4 (±30.5 SD)</td>
<td>520.0 (±44.9 SD)</td>
<td>564.5 (±44.5 SD)</td>
</tr>
</tbody>
</table>

**p < 0.0001 vs baseline, Dunnett’s test.**

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Evolution of ECG Changes in Tako Tsubo Cardiomyopathy (TTC) include T-wave inversion and QTc prolongation, but the relationship of these changes to the evolution of TTC is uncertain. Furthermore, torsade de pointes (TdP) has been reported to occur, but its relationship to QT prolongation in TTC is unclear.

Method: We examined serial ECGs over the first 48 h post-admission in 22 women with TTC (after excluding 7 patients with initial arrhythmia or bundle branch block). Mean age of the women studied was 66.9 (±12.8 SD) years. We compared ECG parameters as summarised in the table below. Episodes of TdF were recorded.

Results: All patients studied had troponin elevation and admission ECG showed ST segment elevation in 9 patients (41%). 3 patients (14%) developed TdF of whom required defibrillation within the first 6 h of presentation, and 1 self-reverting after 24 h. Significant QT prolongation (defined as QTc > 470 ms) was present in 4 (18%) of initial ECGs, and 18 (82%) ECGs at 24 h (p < 0.0001). However, both early cases of TdF occurred prior to the development of significant QT prolongation.

Conclusions: (1) Irrespective of the presenting ECG, most patients with TTC develop widespread T wave inversion and QTc prolongation approximately 24 h post-presentation. (2) Although TTC is associated with a substantial risk of development of TdF, this often occurs before evolution of QTc prolongation. The relationship between ECG changes and intramyocardial inflammatory response in TTC needs further study.

Table comparing ECG parameters at admission, 24 h and 48 h.

Discussion: Programming lead outputs minimally above threshold produced successful LV capture 96.4% of the time. There was no difference in %LV capture between pacemaker brands.