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Arrhythmias and Clinical EP

SELECTIVE LATE SODIUM CURRENT INHIBITOR ALTERED ATRIAL ELECTRICAL CONDUCTION BUT NOT ATRIAL ACTIVATION PATTERN

Moderated Poster Contributions
Arrhythmias and Clinical EP Moderated Poster Theater, Poster Hall B1
Saturday, March 14, 2015, 4:15 p.m.-4:25 p.m.

Session Title: Translating Arrhythmia Mechanisms to Therapy
Abstract Category: 5. Arrhythmias and Clinical EP: Basic
Presentation Number: 1167M-07

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Background: Ranolazine (Ran) and dronedarone (Drone) are new drugs with efficacy to maintain sinus rhythm. Ran, a late sodium current inhibitor, but not Drone, caused no increase in mortality in patients with AF and organic heart disease. The objective of this study was to compare the effect of ranolazine and dronedarone on atrial activation pattern and intraatrial conduction.

Methods: Electrogram was recorded from two identical multi-electrode recording arrays (48 channels each) placed against the left and right atria of Langendorff-perfused female rabbit isolated hearts. Continuous 5 s recordings were analyzed offline. Isochronal maps were drawn from the recording data.

Results: Ran (1-30 μM) significantly prolonged intraatrial activation conduction time and mean activation time in frequency- and concentration-dependent manners. At the frequency of 3.3 Hz, 4.0 Hz and 5.0 Hz, Ran (1-30 μM) increased left and right intraatrial conduction time by 5.22±0.14, 7.33±0.07, 9.78±0.02 ms, and 6.89±0.09, 8.83±0.23 and 13.06±0.96 ms, respectively. It also prolonged left and right atrial mean activation time by 2.85±0.03, 3.92±0.11, 5.23±0.09 ms and 3.15±0.14, 3.75±0.15, 6.58±0.40 ms, respectively ($n=9$, $p<0.05$). Ran caused no change in the activation pattern of the interatrial conduction. In contrast, Dron (0.1-3 μM) caused no significant changes in atrial activation conduction time and mean activation time ($n=7$, $p>0.05$).

Conclusion: Compared with multichannel inhibitor dronedarone, selective late sodium current inhibitor ranolazine has obvious frequency dependence to slow the intraatrial electrical conduction, which can partially explain the anti-AF mechanism of ranolazine.