

**AUTONOMIC NERVE ACTIVITY AND THE TERMINATION OF PAROXYSMAL ATRIAL TACHYARRHYTHMIA**

ACC Poster Contributions

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Background: Simultaneous sympathovagal discharges are triggers of paroxysmal atrial tachyarrhythmia (PAT) in dogs with intermittent rapid atrial pacing. However, the effects of autonomic nerve activity on PAT termination remain unclear.

Methods: We recorded left stellate ganglia nerve activity (SGNA), thoracic vagus nerve activity (VNA) and atrial electrogram from the junction of left atrium and left superior pulmonary vein in 8 ambulatory dogs using implanted radio-transmitter. The atrioventricular node was ablated and the ventricles were paced at 100 bpm. After 4-6 weeks of intermittent high rate (up to 600 bpm) left atrial pacing, spontaneous PAT episodes (including both atrial fibrillation and atrial tachycardia) were observed. All PAT episodes with >30 s duration were analyzed. The integrated SGNA and VNA, 0-15 s and 15-30 s prior to PAT termination were determined with custom software.

Results: A total of 79 PAT episodes were analyzed. Median duration of PAT was 59 s (range 30 s~14770 s). Manual analyses showed that there was an apparent increase of SGNA prior to PAT termination in 53 (67%) of episodes. Integrated SGNA and integrated VNA 0-15 s prior to PAT termination were significantly greater than baseline (145.0 ± 70.4 vs 12.9 ± 4.2 mV and 17.6 ± 8.3 vs 10.2 ± 1.1 mV, respectively, $P < 0.05$). The integrated SGNA 0-15 s prior to termination was significantly greater than 15-30 s prior to termination (96.1 ± 56.8 mV, $P = 0.000$). The integrated VNA 0-15 s prior to termination did not change significantly, compared with 15-30 s prior to termination (17.9 ± 7.4 mV). The sympathovagal ratio 0-15 s prior to PAT termination was significantly higher than 15-30 s prior to termination (9.4 ± 5.7 vs 6.1 ± 4.3 , $P < 0.001$). The longer tachycardia (975.5 ± 2496.8 s) needed the longer duration of SGNA (11.8 ± 7.0 s) to terminate the PAT ($P < 0.001$).

Conclusions: Increased SGNA but not VNA was observed prior to PAT termination. These findings suggest that autonomic nerve activity and sympathovagal imbalance are important in the termination of PAT episodes.