**THE EFFECT OF FLECAINIDE AND RANOLAZINE ON CALCIUM TRANSIENTS IN RAT CARDIOMYOCYTES**

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*Background*: Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a genetic condition that results in an increased propensity for arrhythmias. It is derived from mutations in either the ryanodine receptors (RYR2) or calsequestrin, both of which are involved in intracellular calcium handling in cardiac myocytes. Currently, CPVT is generally managed by beta-blockers, although flecainide, an established class 1c anti-arrhythmic, and has recently been demonstrated as having significant clinical benefit for CPVT due to its peak Ina blocking properties. Ranolazine, an anti-anginal, has also gained prominence due to its late Ina blocking properties, and therefore potentially represents a greater role in managing arrhythmias in failing hearts. Aims: Our study aimed to determine the effect of flecainide and ranolazine on calcium transients in healthy and failing rat cardiomyocytes.

*Method*: Ventricular myocytes were isolated from healthy and 16-week MI rats. Wide-field epi-fluorescence microscopy was used to image waves, and Ca2+ transients were recorded using Fluo-4 AM loaded cells. Cardiomyocytes were infused with 5µM of flecainide or 10µM ranolazine, and paced at 0.5 Hz. 20 mM caffeine spritz was used to assess SR Ca content.

*Results*: Both flecainide and ranolazine infusion in healthy cardiomyocytes showed no significant change in calcium transient height (0.41 ± 0.06 vs. 0.26 ± 0.06, p= 0.13, and 0.57 ± 0.14 vs. 0.2 ± 0.1, p= 0.22). Ranolazine infusion in failing cells also resulted in no significant reduction in transient height (0.45 ± 0.03 vs. 0.07 ± 0.03, p=0.25). However flecainide led to a significant transient height reduction in the failing cardiomyocytes (0.65 ± 0.12 vs. 0.17 ± 0.02, p<0.5).

*Conclusion*: Ranolazine exposure had no significant effect in reducing calcium transients in both healthy and failing cardiomyocytes. Flecainide however seemed to have a significant effect on cells isolated from failing cardiomyocytes, which indicates a greater role for it in such situations.