

Mechanically induced arrhythmias in hypertrophic heart

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Introduction. We have previously shown that rapid stretch of the ventricle or rapid release of tension can induce arrhythmias (Saint, Kelly & Mackenzie, 2010). Hypertrophic hearts show increased sensitivity to stretch induced arrhythmias (Evans, Dalton & Lev, 2000), but how these mechanisms may be altered in hypertrophic hearts is not well understood. Here we investigate mechanically induced arrhythmias in isolated hearts from Wistar-Kyoto (control) and age-matched Spontaneously Hypertensive Rats (SHR).

Methods. Langendorff perfused hearts had a fluid filled balloon placed in the left ventricle, connected to a servo-driven syringe injector. Epicardial monophasic action potentials and intraventricular pressure were monitored to detect ectopic beats. Left Ventricular End Diastolic Pressure (LVEDP) was set at 5 to 10 mm Hg and the minimum step pressure increase which just triggered an ectopic beat was taken as threshold for stretch-induced arrhythmias (St-Ar).

Results. SHR had pronounced cardiac hypertrophy (cardiac index $0.48 \pm 0.02\%$, n=15 in SHR vs $0.41 \pm 0.02\%$, n=11 in Wistar-Kyoto; *P* **Discussion.** Hypertrophic hearts (SHR) are more sensitive to mechanically induced arrhythmias. Streptomycin (a blocker of stretch-activated channels) decreased the sensitivity in both SHR and control.

Evans SJ, Dalton GR & Levi AJ. (2000) *Journal of Cardiovascular Risk*, **7(3)**: 163-75.

Saint DA, Kelly D & Mackenzie L. (2010) in *Mechanosensitivity of the Heart*, pp 275-300 Eds Kamkin and Kiseleva, Springer.