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INCREASED HEART SIZE LESSENS ANESTHETIC PRECONDITIONING OF ISOLATED GUINEA PIG HEARTS

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Introduction: Anesthetic preconditioning (APC) with sevoflurane reduces myocardial ischemia/reperfusion injury. Recent investigations have reported that older hearts are not susceptible to APC (1,2). We investigated if heart size is a determinant of susceptibility to APC.

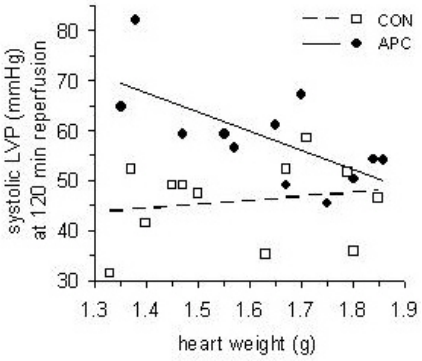
Methods: Langendorff-prepared guinea pig hearts of different weights (wt, 1.3–1.9 g) were exposed to 1.30.1 mM sevoflurane for 15 min followed by 30 min washout (APC; n=12) before 30 min global no flow ischemia and 120 min reperfusion. Control hearts (CON; n=12) were not subject to APC. Left ventricular pressure (LVP) was measured isovolumetrically. Infarct size was determined by TTC staining. Values are meanSEM; statistics: two-tailed unpaired t-test and regression analysis (y=b+mwt) with P<0.05.

Results: Functional data were not different between groups at the beginning of the experiments (not shown). Table shows that APC improved coronary and myocardial function and attenuated infarction at 120 min reperfusion (*). However, systolic (figure) and developed LVP, dLVP/dt-max and dLVP/dt-min, and coronary flow showed a significant negative correlation with heart weight in APC hearts (#), but not in CON hearts at 120 min reperfusion; in contrast, infarct size correlated negatively with heart weight in CON hearts, but not in APC hearts (#, .35>R>.47).

Conclusion: Larger, i.e., older guinea pig hearts are less susceptible to cardioprotection by APC than are smaller, i.e., younger hearts. This may have important implications not only for further research on APC but also for clinical applicability of APC in older patients.

References:

1. Oguchi T et al. *Anesthesiology* 2003;99:A688.
2. Sniecinski R et al. *Anesthesiology* 2003;99:A1548.



120 min reperfus.	n	weight (g)	sysLVP (mmHg)	diaLVP (mmHg)	devLVP (mmHg)	dLVP/dt$_{max}$ (mmHg/s)	dLVP/dt$_{min}$ (mmHg/s)	coronary flow (ml/min/g)	infarct size (%)
CON regression	12	1.58±0.05	46±2 33+8*wt*	14±3 19-4*wt*	33±4 -2+22*wt*	590±73 22+359*wt*	461±63 -217-154*wt*	5.0±0.5 1.0+2.5*wt*	50±2 83-20*wt*#
APC regression	12	1.63±0.05	57±3* 120-38*wt*#	8±2 -2+6*wt*	50±4* 122-44*wt*#	779±86 2554-1087*wt*#	632±71 -2030+856*wt*#	6.4±0.4* 13.4-4.3*wt*#	31±4* 16+9*wt*