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Cardiac stress test induced by dobutamine and monitored by cardiac catheterization in mice.

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Abstract

Dobutamine is a β-adrenergic agonist with an affinity higher for receptor expressed in the heart (β1) than for receptors expressed in the arteries (β2). When systemically administered, it increases cardiac demand. Thus, dobutamine unmasks abnormal rhythm or ischemic areas potentially at risk of infarction. Monitoring of heart function during a cardiac stress test can be performed by either echocardiography or cardiac catheterization. The latter is an invasive but more accurate and informative technique that the former. Cardiac stress test induced by dobutamine and monitored by cardiac catheterization accomplished as described here allows, in a single experiment, the measurement of the following hemodynamic parameters: heart rate (HR), systolic pressure, diastolic pressure, end-diastolic pressure, maximal positive pressure development (dP/dtmax) and maximal negative pressure development (dP/dtmin), at baseline conditions and under increasing doses of dobutamine. As expected, in normal mice we observed a dobutamine dose-related increase in HR, dP/dtmax and dP/dtmin. Moreover, at the highest dose tested (12 ng/g/min) the cardiac decompensation of high fat diet-induced obese mice was unmasked.