Title: Effect of beta 1-adrenoceptor blockade in rats at 5 bar ambient pressure

Authors: Risberg, J
Hordnes, C
Stuhr, LE
Tyssebotn, I

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Abstract: Conscious rats exposed to 5 bar (500 kPa) ambient pressure show increased total myocardial blood flow (TMBF) and enhanced cardiac contractility in spite of unaltered mean arterial pressure (MAP), heart rate (HR), and cardiac output (CO). Four groups of awake, adapted rats were given injections of atenolol at 1 bar air or 5 bar normoxic N2, or both. Atenolol injected at 1 bar caused a marked reduction of HR, MAP, peak left ventricular pressure (LVP), and rate of LVP rise (+dP/dt) and fall (-dP/dt). In spite of beta 1-adrenoceptor blockade, ambient pressure rise increased HR, LVP, +dP/dt, -dP/dt, TMBF, and calculated cardiac O2 consumption ($P < 0.05$). A second atenolol injection at 5 bar caused a brief reduction in HR but did not affect cardiac contractility. Rats receiving the first atenolol injection at 5 bar demonstrated unchanged TMBF. We conclude that beta 1-adrenoceptor blockade does not annual the increase in cardiac contractility associated with hyperbaria.

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