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Cardiac Physiology

PROPRANOLOL, NITROGLYCERIN AND CORONARY-ARTERY DISEASE Propranolol and nitroglycerin appear to have opposite effects on some aspects of left ventricular performance. Propranolol increases left ventricular volume, while nitroglycerin reduces it. Propranolol slows cardiac rate; an increased rate is often associated with the use of nitroglycerin. The authors have studied both drugs singly and in combination in 18 patients with coronary-artery disease. Nitroglycerin (0.4 mg sublingually) decreased left ventricular end-diastolic volume index (LVEDVI [ml/m²]) from 94 ± 8 (SEM) to 66 ± 5. Nitroglycerin administration increased left ventricular ejection fraction (LVEF) from 0.52 ± 0.04 to 0.64 ± 0.05. Cardiac rate increased significantly from 72 ± 2 to 79 ± 79/min. Two hours after oral administration of propranolol (20 mg), cardiac rate had changed significantly (63 ± 2/min); no significant change in LVEDVI or LVEF was observed. When the dosage of propranolol was increased to 40 mg, there was a significant increase in LVEDVI (113 ± 4 ml/m²) and a decrease in LVEF (0.47 ± 0.06). Cardiac rate decreased significantly

(63 ± 2). Propranolol (80 mg) produced similar changes in LVEDVI (96 ± 6 ml/m²), LVEF (0.58 ± 0.03), and rate (54 ± 2/min). When therapy with both propranolol (40 mg) and nitroglycerin was instituted, LVEDVI was decreased (59 ± 3 ml/m²) significantly compared with control. A significant change in LFEF was not observed. Combination of propranolol (80 mg) and nitroglycerin produced a significant decrease in LVEDVI (58 ± 4 ml/m²) and a significant increase in LVEF (0.75 ± 0.02) compared with control. Cardiac rates with combination therapy were 64 ± 3/min (propranolol, 40 mg) and 51 ± 2/min (propranolol, 80 mg); the latter value represented a statistically significant change. The authors conclude that the data suggest that combination therapy with nitroglycerin and propranolol may "favorably alter the left ventricular volume and heart rate in terms of the myocardial demand for oxygen." (*Steele PP, and others, Effects of propranolol and nitroglycerin on left ventricular performance in patients with coronary arterial disease. Chest* 73:19-23, 1978.)