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EFFECTS OF NITROGLYCERIN ON HEMODYNAMICS AT EXERCISE IN PATIENTS WITH SYNDROME X -COMPARED WITH EFFORT ANGINA PECTORIS-.

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Effects of Nitroglycerin(NTG 0.3mg sublingual administration) on exercise-induced hemodynamic changes were studied in 11 patients with chest pain and exercise-induced ST segment depression but normal coronary arteriograms(Group X) and in 14 patients with angiographically proved coronary artery disease(Group AP).
Every patients performed multi-stage bicycle ergometer testing both, with and without NTG administration at supine position. Electrocardiogram, blood pressure, cardiac output, mean pulmonary artery pressure(PAm) and ejection fraction(EF) were measured at rest and every 4 minutes during exercise. In group X, EF rose slightly and ST segment depressed during exercise without NTG. In group AP, however, EF fell significantly, PAm rose markedly and ST segment depressed during exercise without NTG. And in the second exercise, NTG improved those hemodynamic changes during exercise in all patients of group AP, but one-third of group X, including ST segment depression.
These results suggest that the pathologic factors other than coronary blood flow may exist in group X.

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EVALUATION OF THE CARDIAC PERFORMANCE IN PATIENTS WITH CORONARY HEART DISEASE AND EFFECT OF NITROGLYCERIN BY THE PULMONARY BLOOD VOLUME IN EXERCISE TESTING.

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The change of the pulmonary blood volume (PBV) was estimated during the exercise testing in 17 subjects with normal coronary artery(group N), 18 patients with angina pectoris(group A) and 25 patients with both old myocardial infarction and angina pectoris(group M). And also the effect of the nitroglycerine(NTG) was examined. The exercise testing was performed by bicycle ergometer in supine position. PBV was estimated by the radio-activity of the systemically administered Tc-99m labeled RBC in the lung field. In results, (1)The left ventricular ejection fraction at the peak exercise increased in group N but decreased in group A and M. (2)Increased pulmonary artery diastolic pressure at the peak exercise(PAd at exercise) was remarkably higher in group A and M than in group N. (3)PBV was unchanged in group N, however, increased 9.6% in group A and 11.0% in group M. (4)After the sublingual administration of NTG, the increased PAd and PBV at the peak exercise was suppressed. Particularly, it was remarkable in group A. Then we concluded that PBV during exercise was very useful for evaluation of the cardiac performance in coronary heart disease.

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DIFFERENTIAL LONG TERM EFFECTS OF DILTIAZEM AND TRICHLORMETHIAZIDE ON LV DIASTOLIC FUNCTION IN PATIENTS WITH ESSENTIAL HYPERTENSION.

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We examined long-term effects of Diltiazem(D) and Trichlormethiazide(T) on LV diastolic function in patients with essential hypertension. The study group consisted of 22 patients and 7 normal population. Using first pass radionuclide ventriculogram(RNV), LVEF,LVEDV,Peak Filling Rate(PFR),and first-third Filling Fraction(1/3-FF) were measured before and 3 months after medication with D or T. PFR and 1/3-FF in the patients showed significant lower values compared with those in normal. 14 patients were started on D at a dose of 180mg/day(group D), and other 8 patients were started on T at a dose of 4mg/day(group T). there was not a difference in mean blood pressure(MBP),heart rate(HR),LV wall thickness and RNV measurement between the 2 groups. After 3 months therapy, simillar reduction of MBP and of HR were found in the 2 groups. LVEF and LVEDV were not changed in both group D and group T. Although PFR was significantly increased frome 1.97+0.92EDV/sec to 2.62+1.00EDV/sec, and 1/3-FF was also increased from 27.8+10.6% to 36.9+11.0% in group D. In group T,whereas, PFR did not show an increase,and 1/3-FF had a tendency to decrease. Thus long term treatment with D produces improvement of LV filling abnormality in hypertensive heart.

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EVALUATION OF LEFT VENTRICULAR (LV) DIASTOLIC FUNCTION DURING COLD PRESSOR TEST (CPT) USING Tc-99m GATED BLOOD POOL IMAGING.

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It has been reported that CPT increases an afterload to the left ventricle by elevating total peripheral resistance as a result of vasoconstriction. Using Tc-99m gated blood pool scintigraphy, hemodynamic responses to CPT were studied in 10 normal subjects (N group) and 10 hypertensive patients (HT group). By the R wave of an ECG as a physiolosical trigger, forward-gated and reverse-gated LV volume curves and those first differential curves were obtained. Ejection Fraction (EF), Peak Filling Rate (PFR) and left atrial contractile fraction to LV filling (AC/SV) were calculated. In both groups, blood pressure rose significantlly, but heart rate was not change during CPT. EF tend to decrease. PFR was lower in HT than in N before CPT and became further lower by CPT. On the other hand, AC/SV increased in compensation for impaired. LV filling in both groups and this tendency was remarkable in HT.

These results suggest that in both groups LV diastolic function is impaired during acute increase of afterload by CPT, and in HT atrial contraction may play an important role in compensating LV filling.