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CARDIAC PERFORMANCE DURING EXERCISE STRESS TEST IN PATIENTS WITH ISCHEMIC HEART DISEASE. -LEFT VENTRICULAR ASYNERGY ASSESSED BY RI METHOD-. M.Shimizu, Y.Yamazaki, Y.Furukawa, H.Tomiya, Y.Udaka, K.Makita, T.Mizuno, A.Nakayama, T.Saito and Y.Inagaki. The 3rd Dept. of Int. Med. N.Arimizu. Dept. of Radiology, Chiba Univ. Sch. of Med. T.Kawamoto, T.Ookubo. Toshiba medical.

50 patients with ischemic heart disease(IHD) and 25 normal healthy subjects were studied with radionuclide(RI) method during supine ergometric exercise. Left ventricular ejection fraction(EF) and wall motion were evaluated by ECG multigated equilibrium blood pool scintigraphy(MUGA) and nuclear stethoscope. Wall motion was assessed by phase analysis and cine display of MUGA images. Cardiac output(CO:by dye dilution method), ECG and blood pressure were also measured during exercise. Left ventricular volumes (endodiastolic volume:EDV, endosystolic vol.:ESV, stroke vol.:SV) were calculated from CO, EF and heart rate. In the IHD patients, EF decreased, on the other hand, EDV and ESV increased in the early stage of exercise, and SV increases were less than in normal subject group. Transient abnormality of wall motion were also observed in many of these patients. It is indicated that transient asynergy is one of the determinants of hemodynamic responced to exercise stress. Thus, evaluation of cardiac performance during exercise stress test by RI method may be valid for deciding the severity of IHD.

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EFFECT OF PROPRANOLOL ON EXERCISE LEFT VENTRICULAR FUNCTION THREE MONTHS AFTER INFERIOR MYOCARDIAL INFARCTION. F.Ohsuzu, N.Aosaki, K.Hosono and *H.W.Strauss. Nat.Def.Med.Coll. Tokorozawa and *Mass.General Hosp., Boston.

Radionuclide ventriculography was performed in 28 patients three months after acute myocardial infarction(MI) at rest and during maximal supine bicycle exercise. Eleven of the 28 patients were receiving propranolol(PROP) for angina occurring after the IMI and in all 11 the angina was stabilized. These 11 were compared to 17 patients not on PROP. Mean peak creatine kinase was similar in both groups. Maximal exercise load also did not differ. Mean±standard deviation heart rate(HR), systolic blood pressure(SBP), left ventricular end-diastolic volume(EDV), end-systolic volume(ESV) and ejection fraction(EF) are shown: (*=p<.05, Ex vs. RE; **=<.05, PRO P vs. NP).

	PROPRANOLOL	NO PROPRANOLOL
	REST EXERCISE	REST EXERCISE
HR	**63±8 107±15*	72±12 **123±20*
SBP(mmHg)	129±22 175±30*	135±18 184±31*
EDV(ml/M2)	70±22 75±23*	56±18 61±19
ESV(ml/M2)	32±12 33±14	28±13 26±15
EF (%)	53±8 55±10	54±11 58±15

In conclusion, rest and exercise ESV and EF are similar 3 months after IMI on or off PROP, and these parameters do not change with exercise. PROP is associated with a lower HR and larger EDV which increases with Ex, suggesting that more preload compensation of the left ventricle to exercise stress is necessary with patients receiving PROP.

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EVALUATION OF RESPONSE OF LEFT VENTRICULAR EJECTION FRACTION TO EXERCISE IN OLD MYOCARDIAL INFARCTION. T.Ichikawa, K.Makino, Y.Futagami, T.Konishi, M.Hamada, T.Nakano, H.Takezawa. 1st Dept. of Intern. Med. H.Maeda. Radiology. Mie University School of Medicine. Tsu.

We studied the pattern of response of left ventricular ejection fraction(LVEF) to exercise in 71 patients with old myocardial infarction. After in vivo labelling of RBCs with Tc-99m 25mCi, multistage exercise test using supine bicycle ergometer was performed beginning at 150 KPM with increased by 150 KPM every 3 minutes. The patients were divided into 4 groups as LVEF response, group 1: increased more than 5%, group 2: unchanged, group 3: increased and then decreased, group 4: decreased more than 5%. Results: Group 1 and 2 have a majority in patients with in-adequate exercise (less than stage II or %DP change <200 and DP <20000). In adequate exercise, group 1 consisted of patients with no LAD lesion or not severe (less than 75% stenosis) LAD lesion. The patients in group 2 had severe LV dysfunction and their LAD region was akinetic or dyskinetic. Group 3 and 4 had multivessels disease or severe (more than 90% stenosis) LAD lesion whose jeopardized myocardium was normokinetic or hypokinetic. We conclude that the exercise response of LVEF was determined not only by the extent of coronary artery lesion, but by the degree of injuries of their jeopardized myocardium.

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ANALYSIS OF THE LEFT VENTRICULAR FUNCTION DURING ACUTE CHANGES OF PRELOAD AND AFTERLOAD. T.Konishi, K.Makino, T.Ichikawa, M.Hamada, T.Nakano, H.Takezawa. 1st Dept. of Intern. Med. H.Maeda. Radiology. Mie University School of Medicine. Tsu.

We assessed the effects on left ventricular function during acute changes of preload and afterload with radionuclide cardiography. Materials and methods: Multistage blood pool scintigraphy was performed at rest and after acute drug intervention (Nifedipine, Phentolamine, Isosorbide Dinitrate, and Methoxamine) in 88 cases with old myocardial infarction, hypertension, cardiomyopathy, and normals. Results: Left ventricular systolic function indexes including LVEF and peak systolic dv/dt were improved by reduced afterload or preload, and worsened by increased afterload. Peak diastolic dv/dt as a diastolic property was worsened by preload reduction but did not change significantly by reduced or increased afterload. Only Nifedipine improved peak diastolic dv/dt suspected due to improved Ca++ metabolism. We conclude that left ventricular systolic property was dependent to preload and afterload but diastolic property would be dependent to preload and did not influenced afterload changes significantly.