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LEFT VENTRICULAR FUNCTION DURING EXERCISE IN HYPERTROPHIC CARDIOMYOPATHY. Tc-99m GATED RADIONUCLIDE ANGIOGRAPHIC STUDY. M. Ifuku, R.Yamaguchi, H.Takahashi, M.Itaya, Y.Koga, F.Utsu, H.Toshima, S.Morita* 3rd Dept. of Intern.Med and Dept. of Radiol* Kurume Univ. School of Med, Kume. M.Hirashima, M.Takaki, Y.Shimokawa, Yame Public Hospital, Yame.

To assess left ventricular performance during exercise in patients with hypertrophic cardiomyopathy (HCM), gated radionuclide angiography was performed during supine bicycle exercise in 26 patients with HCM, 12 patients with chest pain syndrome (CP) and 11 healthy controls. 25 of them was determined pulmonary artery (PA) pressures and cardiac output by thermodilution simultaneously. Left ventricular (LV) End-diastolic volume decreased slightly during exercise but did not differ in the 3 groups. End-systolic volume decreased in CP and controls but increased in HCM. As a result ejection fraction (EF) increased in CP (9%) and control (22%) but decreased in HCM (10%). An increase in LV stroke work index was depressed despite a marked elevation of PA diastolic pressure in HCM, resulting in right-downward shift of the LV function curve. In addition, HCM patient with EF reduction >10% had a significantly lower increase in peak ejection rate and 1/3 peak filling rate. These observations suggested that patients with HCM have impaired LV performance during exercise, which may be related to reduced reserve of LV systolic and diastolic function.

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THE EFFECT OF DILTIAZEM HYDROCHLORIDE ON HEMODYNAMIC STATUS IN HYPERTROPHIC CARDIOMYOPATHY: EXAMINATION BY CARDIAC BLOOD POOL SCINTIGRAPHY. S.Abe, A.Hirai, T.Ochiai, Y.Kobayashi, S.Fujii, S.Kiyomi, H.Takahashi, T.Abe, F.Nakazawa, K.Miyauchi, K.Umeda, Y.Nagai, and c. Ibukiyama. Tokyo Medical College Kasumigaura Hospital, Ibaraki.

In order to determine the effect of diltiazem (DZ) on the hemodynamic status in cases of HCM, a comparative examination was made of findings obtained by gated cardiac blood pool scintigraphy with Tc-99m-RBC before and after the administration of DZ. Cardiac blood scintigrams were taken before and at 2, 5, 10 and 20 minutes after intravenous administration of DZ in eleven patients with HCM. The ejection fraction (EF), the peak ejection rate (PER), 1/3 filling fraction (1/3 FF), the peak filling rate (PFR), and 1/3 mean filling rate (1/3 MFR) were computed from the left ventricular volume curve. Compared to the findings obtained before DZ administration, the heart rate decreased at 10 and 20 minutes after administration ($P < 0.05$), and the blood pressure decreased both during systole and diastole at 2 and 5 minutes after administration ($P < 0.01$). There were no significant changes in the values of EF and PER, which are indices of the systolic status, but there were significant increases in the values of 1/3 FF and 1/3 MFR, which are indices of the diastolic status, at 5 and 10 minutes. These findings indicated that DZ improves the left ventricular diastolic filling in HCM.

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EVALUATION OF LEFT VENTRICULAR FUNCTION IN HYPERTROPHIC CARDIOMYOPATHY USING FIRST PASS AND EQUILIBRIUM METHOD WITH MULTI-GRADED EXERCISE. M.Minami, K.Machida, T.Ohtake, M.Itoh, Y.Okada, J.Nishikawa, M.Iio, University of Tokyo, Tokyo

We executed first pass & equilibrium method with Tc-99m albumin to 6 normal persons [NOR] and 21 hypertrophic cardiomyopathy (5 apical hypertrophy [AH], 5 non-obstructive type [HCM], 5 obstructive type with no medication [HOCM] and 6 HOCM with propranolol [HOCM*]). Each patient was loaded multi-graded exercise on (25W, 50W & 75W, 3min. each) by bicycle ergometer. 10mCi RI was injected at rest and 20mCi RI during 75W exercise and the radiocardiograms of RV & LV were shown to calculate MTT. ECG gated cardiac pool scannings were done for 5min. at rest and 2.5 min. during each exercise. In AH and HOCM*, MTT was prolonged but the increase rate didn't change. EF of HCM & HOCM showed no change during exercise. %CO & %SV of HOCM is lower than others. EDV of NOR & HCM increased and ESV of NOR decreased by exercise but the others had no change. TES of HCM, PER of HCM & HOCM and PFR of HCM did not increase. Propranolol was effective only in increasing EDV & ESV and inhibition of increase in TES & PFR. In conclusion, 1) ECG gated cardiac pool scannings are useful for evaluating LV function of HCM, 2) tolerance to exercise of LV decreases in HCM, 3) oral administration of propranolol doesn't affect EF, CO & SV in spite of decreasing contractility of cardiac muscle.

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EVALUATION OF LEFT VENTRICULAR FUNCTION IN PATIENTS WITH DILATED CARDIOMYOPATHY USING GATED BLOOD POOL SCINTIGRAPHY. T.Ichikawa, M.Yamamuro, K.Makino, Y.Futagami, T.Konishi, T.Nakano, H.Takezawa, H.Maeda* and T.Nakagawa* 1st Dept. of Intern. Medicine and Radiology*, Mie University School, Tsu.

Left ventricular function and prognosis were investigated using gated blood pool scintigraphy (GBPS) in 34 patients with dilated cardiomyopathy (DCM), who underwent cardiac catheterization.

GBPS was performed in modified LAO position after in vivo labelling Tc-99m-RBCs. And multistage exercise test using supine bicycle ergometer was also done in 19 cases.

Patients were divided into 3 groups by estimation of regional wall motion with functional image as follows, group A: with some segment of normal wall motion, group B: with diffuse hypokinesis and group C: with dyskinesis. Left ventricular ejection fraction (LVEF) was $43.7 \pm 7.7\%$, $23.4 \pm 5.6\%$, $20.4 \pm 11.9\%$ respectively. LVEF response during exercise showed no definite tendency in all groups, but LVEF was unchanged or decreased at peak exercise in group C. Percent change of double product was $259 \pm 46\%$, $238 \pm 43\%$, $182 \pm 27\%$ respectively. The 2 years-mortality rate after RI study was $1/7 (14.3\%)$, $3/6 (50\%)$, and $4/5 (80\%)$.

We conclude that asymmetric reduction in LV wall motion is also common in DCM. Especially in patients with dyskinesis, LV function was deteriorated both at rest and during exercise, and prognosis was unfavorable.