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THE EVALUATION OF MYOCARDIAL ISCHEMIA BY HANDGRIP EXERCISE AND NITROGLYCERIN ADMINISTRATION. K. Miwa, A. Yoshida, K. Kawashita, H. Kambara, C. Kawai, Y. Yonekura*, K. Yamamoto*, N. Tamaki* and Y. Ishii*. The Third Division, Department of Internal Medicine and Department of Nuclear Medicine*, Kyoto University Kyoto.

Ejection fraction (EF), end-diastolic count and stroke count were assessed in normal subjects and in patients with coronary artery disease (CAD) by a gated equilibrium method of RI angiography in LAO projection using Tc-99m labeled RBC. Handgrip exercise test (HG), administration of nitroglycerin (NTG) and repeated handgrip exercise test after NTG administration were performed. EF fell significantly in patients with CAD (change of $\% = -4.3 \pm 7.5$; $p < 0.05$), while EF rose significantly in normal subjects (change of $\% = 4.0 \pm 3.5$; $p < 0.01$). Therefore, handgrip test was a sensitive and useful procedure as a screening test for significant CAD. EF reduced by HG were improved by NTG administration in patients with CAD. In patients with CAD stroke count was not affected by administration of NTG, but end-diastolic count during HG was significantly decreased ($\% \text{ change} = -15.8 \pm 13.2$; $p < 0.01$). The favorable effect of NTG to HG was more prominent in patients with myocardial infarction, particularly in patients with lower left ventricular end-diastolic pressure, than in normal subjects.

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EVALUATION OF LEFT VENTRICULAR FUNCTION IN PATIENTS WITH ISCHEMIC HEART DISEASE BY EXERCISE STRESS RADIONUCLIDE ANGIOCARDIOGRAPHY. H. Miyakoda, M. Iwase, Y. Koike, O. Ueda, M. Tanaka, K. Sakurai, N. Kawai, H. Inagaki, T. Kondo, N. Taniguchi, M. Tsuzuki, Y. Yoshida, M. Yokota and I. Sotobata. Nagoya National Hospital and Nagoya University. Nagoya.

To evaluate the effects of exercise on the left ventricular function, first-pass radionuclide angiocardiograms were performed both at rest (Rest) and immediately after supine-position bicycle ergometer exercise (Ex) in 18 patients with effort angina, 14 with old myocardial infarction and 8 normal men. In normal subjects left ventricular ejection fraction significantly increased from $0.60 (\pm 0.04)$ to $0.82 (\pm 0.05)$ ($p < 0.001$), end-diastolic volume slightly decreased (Ex EDV/Rest EDV = 0.93 ± 0.07), and cardiac output significantly increased (Ex/Rest = 3.27 ± 0.63). In patients with effort angina, EF significantly decreased from $0.62 (\pm 0.07)$ to $0.51 (\pm 0.11)$ ($p < 0.001$), EDV increased (Ex/Rest = 1.37 ± 0.28), and CO did not so increased (Ex/Rest = 1.82 ± 0.54). In patients with old myocardial infarction EF remained unchanged (0.49 ± 0.15 vs 0.48 ± 0.16), EDV slightly increased (Ex/Rest = 1.17 ± 0.13), and CO did not so increased (Ex/Rest = 1.97 ± 0.53). In 14 patients with angina pectoris new development of abnormal LV wall motion was shown in the area supplied by a significantly stenosed coronary artery. This technique seems to be useful for evaluating LV function in patients with ischemic heart disease.

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INTERVENTION RADIONUCLIDE VENTRICULOGRAPHY (EXERCISE DRUG) FOR DETECTION OF CORONARY ARTERY DISEASE AND LV FUNCTIONAL RESERVE. T. Nishimura, T. Uehara, K. Hayashida, H. Naito, T. Kozuka, M. Saito*, Y. Kitoh** Dept. of Radiology, Internal Medicine* and Surgery** National cardiovascular Center, Osaka.

Intervention ventriculography during exercise and administration of nitroglycerin were developed to evaluate the detection of CAD and LV functional reserve by multi-gated cardioangiography. 48 cases of CAD and 10 cases of normal function were studied by the combination methods of intervention ventriculography and coronary arteriography. In CAD cases, the value of LVEF from rest to exercise were failed to increase 5 percent in many cases, while in normal cases, LVEF increased 10 percent in all cases.

For the detection of CAD, sensitivity and specificity by intervention radionuclide study were 81.2%, 100%, while by stress ECG study, 73%, 60%, respectively.

For the LV functional reserve, in significant decreased EF cases, non-infarcted area of CAD showed reduced LV motion in the case of multi vessel diseases, and compensatory hyperkinetic LV motion in the case of non-diseases vessels, while in significant increased EF cases, 75% stenosis of single vessel disease showed normal LV motion.

In conclusion, intervention radionuclide ventriculography is very useful to evaluate the detection of CAD and LV function reserve noninvasively.

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EVALUATION OF RI ANGIOCARDIOGRAPHICAL CHANGES IN ESSENTIAL HYPERTENSION AND THYROID DISORDER. Y. Kawamura, M. Fukumoto, J. Yamazaki, S. Suzuki, S. Iida and T. Morishita. 1st Internal Medicine of Toho University. Tokyo.

In this report, we evaluated the changes of left ventricular functions in cases of essential hypertension, hyperthyroidism, and hypothyroidism, according to therapy. The left ventricular functions were evaluated with systolic and diastolic time, left ventricular systolic velocity, CO and EF, which were calculated by RI angiocardiography synchronized with ECG. In propranolol (60mg/day) and pindolol (15mg/day) groups, heart rate and blood pressure decreased gradually, because β -blocker effected to the cardiac function directly. In hydralazine group (150mg/day), blood pressure more decreased to the normal level significantly, but it was secondary action vasodilator. In hyperthyroidism cases, left ventricular cardiac functions normalized 4 to 6 weeks after the time of hormonal normalized levels, according to the administration of methimazole. In hypothyroidism cases administered l-thyroxine, cardiac functions changed the same way. In this study, we conformed that RI angiocardiography is useful clinically to determine the hemodynamics and the evaluation of the effect of therapy.