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EVALUATION OF LEFT VENTRICULAR FUNCTION IN CORONARY ARTERY DISEASE BY STRESS RADIO-NUCLIDE VENTRICULOGRAPHY.

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In order to assess global and regional left ventricular function in coronary artery disease(CAD), stress radionuclide ventriculography was performed in 9 normal subjects, 12 patients with myocardial infarction(MI), 8 patients with angina pectoris (AP). Multi-gated cardiac blood pool imaging on modified LAO projection was done at rest, during exercise and recovery respectively. In each period, left ventricular global and regional ejection fraction(EF), peak filling rate(PFR), mean filling rate during the first half of rapid filling period(MFR in 1/2 RF) and peak filling acceleration(PFA) were calculated from the volume curve, derived from time-activity curve approximated to third harmonics curve using Fourier transformation.

On exercise, global EF in MI and AP was significantly lower than that in normal subjects and regional EF was useful to detect the ischemic area. In CAD, changes of regional EF and MFR in 1/2 RF induced by exercise were significantly low in the ischemic area and were considered to be the useful parameters for detecting the site of ischemia.

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ASSESSMENT OF SYSTOLIC AND DIASTOLIC CARDIAC FUNCTIONS IN ISCHEMIC HEART DISEASE AT REST AND DURING EXERCISE.

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Multigated blood-pool study was performed to evaluate regional and global cardiac performance in 10 cases of normal persons(N) and 20 cases with ischemic heart disease(IHD) at rest and during exercise. Regional and global volume curves were simulated to calculate following indices using 2nd- and 3rd-order harmonics in Fourier series, respectively; ejection fraction(EF), time to end-systole (TES), peak ejection rate(PER), time to PER(TPE), peak filling rate(PFR), and time to PFR(TPF). As regional indices, standard deviation(SD) of TES, TPE, and TPF phase distribution histogram were obtained. In N, EF and PER significantly increased during exercise, while IHD showed no significant change in EF and PER. $PFR\sqrt{RR}$ showed increase in N and IHD significantly. For sensitivity, IHD was detected in 5 cases(25%) by $PFR\sqrt{RR}$ and in 7 cases(35%) by TPF(SD) at rest. IHD was detected in 16 cases(80%) by EF and in 8 cases(40%) by TES(SD) during exercise.

We concluded that EF was more sensitive index to detect IHD than diastolic indices during exercise.

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THE STUDY OF EXERCISE INDUCED ST SEGMENT ELEVATION IN ANTERIOR MYOCARDIAL INFARCTION BY RADIONUCLIDE METHODS.

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To evaluate the mechanism and the clinical significance of exercise induced ST segment elevation in anterior myocardial infarction, 13 cases of old anterior myocardial infarction with exercise induced ST segment elevation were analyzed by exercise Tc-99m RBC ventriculography(stress RNV) and exercise Tl-201 myocardial perfusion scintigraphy(stress TL). All cases showed over 0.1mV ST segment elevation overt the infarction zone, reflected by Frank leads presenting with QS configuration and left ventricular wall motion abnormality reflected by stress RNV. 3 out of 13 cases had reversible ischemia by stress TL scan. One of 3 positive scan had 3 vessel disease by CAG. The other two cases were thought ischemia in the surroundings of infarction zone. Three cases showed increased wall motion abnormality at infarction zone by stress RNV. In conclusion 0.1mV ST segment elevation overt the infarction zone of our study might not indicate the increased wall motion abnormality, myocardial ischemia and left ventricular dysfunction exclude few cases (23%).

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ASSESSMENT OF LEFT VENTRICULAR FUNCTION IN OMI WITH OR WITHOUT EXERCISE-INDUCED ST ELEVATION. A.Okabe, K.Okuzumi, T.Ueno, K.Kato The Cardiovascular Institute. Y.Sasaki.Toho University School of Medicine, Tokyo.

To assess the hemodynamic significance of ST elevation during exercise stress in OMI, we compared the LV functional reserve in patients with ST elevation(Gr-I) and in patients without ST elevation(Gr-II). Gr-I composed of 11 patients including 8 with anterior and 3 with anterior and inferior infarction. Gr-II composed of 13 patients including 4 with anterior, 7 with inferior and 2 with both anterior and inferior infarction. Tl-201 stress myocardial SPECT was performed in all 24 patients and none of them exhibited the evidence of ischemia other than infarction. EF, ESV and SV were determined before and during upright ergometer exercise using MUGA technique. There were no significant differences in EF at rest and during exercise between two groups. Among 11 Gr-I patients EF decreased in 2 cases, ESV increased in 7 cases and SV decreased in 3 cases during exercise. Of 13 Gr-II patients EF decreased in one case, ESV increased in 7 cases and SV decreased in one case. There were no statistically significant differences in the responses of LV function to exercise stress between two groups. It is concluded that exercise induced ST elevation in OMI could not always imply the decrement of global LV functional reserve.