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The Influence of the cardiac performance of the non-infarcted area in the patients with myocardial infarction. Y.Kimura, T.Iwasaka, H.Onoyama, T.Sugiura, H.Koito, K.Matamoto, S.Natuzumi, T.Shiraishi, and M.Inada. Kansai Medical University, Osaka.

We studied cardiac performance of the non-infarcted area in 38 patients with myocardial infarction(MI) by RI angiocardigraphy, at 1 month and 1 year(n=20), or at 3 and 4 years(n=18) after MI. The regional ejection fraction (REF) of the infarcted(I) and non-infarcted(N) areas were calculated from averaging the REF of each crystals in both I and N areas.

The left ventricular ejection fraction (LVEF) was unchanged or increased (40-46%) from 1 month to 1 year after MI in the patients without cardiac events during this period. The % change of the I-REF was 29%, and the % change of N-REF was 14% from 1 month to 1 year after MI, indicating a better improvement in the I-REF. However, LVEF decreased 56% of all cases during 3 and 4 years. In patients with decreased LVEF, 80% of all cases had the multi vessel disease, and N-REF decreased significantly.

WE concluded that the observation of N-REF after MI for a long period is very useful for estimating the cardiac performance of the patients with multi vessel disease.

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STUDIES ON EXERCISE TOLERANCE(EXT) USING RADIONUCLIDE VENTRICULOGRAPHY(RNVG) IN EARLY STAGE OF ACUTE MYOCARDIAL INFARCTION(AMI). E.Kinoshita, C.Imaoka, M.Ide, N.Kanemoto, Y.Goto and Y.Suzuki. Tokai University School of Medicine and Radionuclear Medicine, Kanagawa.

The aims of this studies are to detect useful parameters for exercise tolerance and to evaluate number of diseased vessels from RNVG done in early stage of AMI. The subjects were 61 patients with AMI(mean age of 55 years); all of them had RNVG at 5-14 days, exercise (submaximal) RNVG at 3-4 weeks and 47 had coronary angiography. Twenty-three patients had SVD and 24 MVD. Parameters calculated from RNVG were LVEF, 1/3EF, PER, PFR and SD of phase analysis. The difference of LVEF at rest and during exercise( $\Delta$ EF) were not correlated with LVEF, 1/3EF, PER and PFR at rest. The only parameters showed correlation was the SD of phase analysis( $r=-0.41$ ,  $p<0.01$ ). The mean SD of group with  $\Delta$ EF $\geq$ 5% was  $23.0\pm 11.5$  while that of group with  $\Delta$ EF $\leq$ 5% was  $36.7\pm 10.6$  ( $p<0.02$ ). There were no parameters to differentiate from SVD to MVD by RNVG at rest. However, PER and PFR during exercise in MVD were significantly decreased compared with those of SVD;  $2.80\pm 0.85$  vs  $3.45\pm 0.83$  ( $p<0.02$ ),  $2.93\pm 1.10$  vs  $3.90\pm 1.22$  ( $p<0.02$ ) respectively.

From these results, we conclude that (1) exercise tolerance during early stage of AMI was strongly associated with abnormalities of left ventricular wall motion; (2) PER and PFR during exercise were the sensitive indicators suggesting the number of diseased vessels in AMI.

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DIAGNOSIS OF ISCHEMIC HEART DISEASE BY LIGHT EXERCISE TEST AND E.MAX. T.Ando, K.Imai, S.Yumikura, S.Saito, Y.Ozawa, M.Hatano and R.Kamata. Nihon Univ. Dep. of 2nd Internal Medicine and Radiology, TOKYO.

To evaluate the cardiac function during exercise and at rest, the Radionuclear-Angiography(RN-A) with light exercise was performed avoid to tilting. In the 34 patients with CAD, the left ventricular factors such as E.max, EF, EDV, ESV, SV, CO and TPR are obtained by RN-A. For analysis, the rate value during exercise(P2) to one at rest(P1) is calculated. The patients were separated in 3 groups such as GA: E.max(P2/P1) $\geq$ 1.4, GB: 1.4 $>$  E.max $\geq$ 1.0, GC: E.max $<$ 1.0. From the CAG findings, GB and GC had multiple vessel disease, but GA had 2VD in three patients and no 3VD. Changes of E.max were 1.83 in GA, 1.14 in GB and 0.77 in GC, EF were 1.11 in GA, 1.0 in GB and 0.8 in GC, EDV were 0.89 in GA, 1.15 in GB and 1.27 in GC. The significant changes of E.max was present between 3 groups. Whenever EF did not change, but E.max was changed significantly. Therefore, it is useful for diagnosis of CAD and to evaluate myocardial ischemia using this method.

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LEFT VENTRICULAR FUNCTIONAL RECOVERY AFTER EXERCISE BY RADIONUCLIDE VENTRICULOGRAPHY IN CORONARY ARTERY DISEASE. A.Yamashina, N.Hayashida, M.Igarashi, M.Yamada, St.Luke's International Hospital

To characterize the left ventricular (LV) functional recovery after the exercise in coronary artery disease (CAD), radionuclide ventriculography (RVG) was performed in 36 patients with chest pain and CAD (stenosis $\geq$ 75%) and 31 angiographically normal control. Symptom limited supine ergometer exercise was performed. Multigated equilibrium RVG were used to measure LV ejection fraction (LVEF) and regional wall motion (RWM) at rest, peak exercise (P-EX), and two post exercise period (Rec I and Rec II)

\LVEF	Rest	P-Ex	Rec I	Rec II
CTRL	69.0 $\pm$ 8.9	78.7 $\pm$ 9.8	85.3 $\pm$ 7.6	79.7 $\pm$ 8.5%
CAD	67.8 $\pm$ 7.0	66.5 $\pm$ 8.9	76.9 $\pm$ 9.2	78.0 $\pm$ 7.2%
P	ns	<.0001	<.001	ns

Abnormal ST depression ( $\geq$ 2mm) was seen in 7/31(23%) and 30/36(83%), abnormal RWM was seen in 5/31(16%) and 32/36(89%), abnormal response of LVEF during exercise ( $\Delta$ LVEF $<$ 5%) was seen in 6/31(19%) and 28/36(78%), and of LVEF at recovery (Rec I $<$ Rec II) was seen in 1/31(3%) and 19/31(53%) of control group and CAD group, respectively. Delayed functional recovery after exercise was specifically seen in CAD and especially with severe single or multivessel CAD. Thus, we conclude that it is useful to observe both exercise and recovery phase characteristics of LV for the diagnosis of CAD.