255

RADIONUCLEAR OBSERVATION ON SYSTEMIC HEMODYNAMICS IN PATIENTS WITH MYOCARDIAL INFARCTION DURING EXERCISE TEST (PART 3).

T.Mochizuki,C.Noro,M.Shimizu,S.Hirano,S.Hayashi,K.Niizuma,R.Kikawada,K.Ishii*&K.Nakazawa*. Departments of Internal Medicine and Radiology*,Kitasato University School of Medicine,Sagamihara.

In order to evaluate the relations of the size, locations and cardiac function of myocardial infarction (MI), we studied systemic hemodynamics in 65 patients (28 with anteroseptal, 15 with extensive anterior, 16 with inferior and 6 with both of anterior and inferior MI) comparing with 12 controls. The ergometer exercise was given to the patients with MI at the time of 38±12 days (mean ±SD) after the onset of MI. At the loads of 0.5Watt/kg and 1.0Watt/kg,LVEF, blood pressure as well as heart rate were measured on supine position by radionuclear method (multigate). LVEF in patients with extensive or both of anterior and inferior MI were remarkably lower than that in other locations of MI. LVEF with anteroseptal MI showed similar values with inferior MI, while the peak GOT of the former were not significantly different from that of the latter. LVEF was inversely correlated with peak GOT at rest and even during exercise in all patients(r=-0.68,at rest;r=-0.70,at 0.5 Watt/kg;r=-0.70,at 1.0Watt/kg). In summary, cardiac pumping ability in MI supposed to be much affected by the size or extent of MI rather than the locations. Furthermore, the size of MI may determine the cardiac reserve for dynamic stress at the rehabilitation period.

256

REGIONAL EJECTION FRACTION DURING EXERCISE IN THE PATIENTS WITH MYOCARDIAL INFARCTION.

Y.Kimura,T.Iwasaka,H.Onoyama,T.Sugiura, K.Koito,K.Matsumoto,S.Natsuzumi,T.Shiraishi, and M.Inada. Kansai Medical Univercity,Osaka

We studied left ventricular function during bicycle exercise(75W) by RI angio (Baird Atomic system77)in the patients with myocardial infarction.

Infarcted regional ejection fraction (I-REF) and non-infarcted REF(N-REF) were calculated from averaging the REF of each crystals in both I and N areas.

Twenty-eight patients completed 75W without chest pain or ECG changes(group A), and 18 cases(group B) did not complete 75W. In 21 patients whose LVEF increased during exercise in group A, I-REF and N-REF both increased from rest. In other 7 patients in group A whose LVEF decreased during exercise, N-REF decreased from rest but I-REF showed no significant change during exercise. In 10 patients with ischemic changes during exercise in group B, global EF, N-REF and I-REF decreased from rest.

Thus, the decrease of N-REF without change of I-REF during exercise suggests multi vessel disease or limited cardiac reserve of non-infarcted area which could not respond to the increasing preload or afterload, and N-REF reflects cardiac function more accurately in patients with prior myocardial infarction.

257

USEFULNESS OF THE EXERCISE-INDUCED PULMONARY BLOOD VOLUME TO THE EVALUATION OF THE CARDIAC PERFORMANCE IN PATIENTS WITH ISCHEMIC HEART DISEASE.

H.Tomiya*, Y.Koshibu*,I.Ishibashi*,Y.Yamazaki*, T.Yamamoto*,K.Makita*,M.Shimizu*,K.Takeda*, T.Saito*,N.Arimizu** and Y.Inagaki* The 3rd Dept. of Int. Med* and Dept. of Radiology** Chiba Univ. School of Medicine, Chiba.

The change of pulmonary blood volume(PBV) was estimated during the multistage physical exercise with bicycle ergometer in supine position. Of 34 patients with electrocardiographic ST-segment depression more than 1 mm, groupX(n=9) showed normal coronary arteries, groupA(n=10) was angina pectoris and groupM (n=15) was old myocardial infarction. Blood pressure, pulmonary artery pressure, cardiac output measured by dye dilution method, ejection fraction(EF) by multi-gate method and PBV was measured during exercise. PBV was obtained from the radio activity of the systemically administered Tc-99m labeled RBC. ROI was adjusted over the right upper and lower lung field. Results and conclusion:(1) EF at the peak exercise increased in groupX and decreased in group A and M. (2) Increased mean and diastolic blood pressure in pulmonary artery was remarkably larger at the peak exercise in group A and M than in group X. (3) PBV was unchanged in groupX, on the other hand, it increased 7.5% in group A and 8.5% in groupM. (4) Increased rate of PBV reveales good correlation with ΔEF(r=-0.73, $p<0.01$) or pulmonary artery diastolic pressure at the peak exercise(r=0.70, $p<0.01$). Then we concluded that PBV during exercise was very useful for evaluation of the cardiac performance.

258

DETERMINATION OF RIGHT VENTRICULAR EJECTION FRACTION USING FIRST TRANSIT CLEARANCE TECHNIQUE.

J.Taki,H.Bunko,K.Nakajima,Y.Shiire,A.Tada, I.Nanbu,N.Tonami and K.Hisada. Department of Nuclear Medicine,School of Medicine, Kanazawa University,Kanazawa, Japan.

First transit clearance technique(FTC) for calculation of right ventricular ejection fraction(RVEF) was evaluated and compared with first pass technique(FP) and gated blood pool technique(GBP). Thirty degrees RAO images were obtained every 0.5 secs. using slanthole collimator. Right ventricular(RV) time activity curve was generated by deconvolution analysis. Exponential function was applied to calculate clearance rate constant(K). RVEF was calculated by the equation: RVEF=k/HR (HR: heart rate). Good intra and interobserver reproducibilities were obtained(r=0.93, 0.97). Good correlation of RVEF was obtained between FTC and FP(r=0.86) and also FTC and GBP(r=0.90). There were no significant differences among RVEF values calculated from these three methods. There was no difference of RVEF between three methods of ROI setting;i.e, RV,RV with partial overlap of RA and 4 pixels in RV. In conclusion this first transit clearance technique is simple and accurate method for RVEF calculation, and the RVEF values are not affected significantly by the way drawing RV ROIs.