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RADIONUCLIDE ANALYSIS OF DIASTOLIC PERFORMANCE DURING EXERCISE IN PATIENTS WITH CORONARY ARTERY DISEASE. S.Takaoka, H.Kataoka,N.Kuroiwa,K.Nakamura and S.Hashimoto. Second department of Kagoshima university School of medicine. Kagoshima

Multi gated radionuclide ventriculograph was performed at rest and during exercise to assess diastolic pead DV/DT and LVEF as diastolic and systolic performance respectively in 10 normal volunteers, 13 NON-CAD and 14 CAD patients. Pead DV/DT and LVEF were increased from rest to exercise in normal volunteers and NON-CAD patients. LVEDV was unchanged in normal volunteers with exercise suggesting the increase of DV/DT was dur to increased diastolic ventricular function. In CAD patients resting DV/DT value was lower than NON-CAD patients suggests decreased diastolic function. Also percent increase of DV/DT from rest to exercise appeared low in CAD patients demonstrated decreased diastolic function of left ventricle on exercise. Amon CAD patients, subgroup with normal LVEFresponse by exercise had diminished percent increase of DV/DT value compared with NON-CAD patients. These data suggests that diastolic DV/DT response by stress had more sensitivity in detection of coronary artery disease than systolic parameter.

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Responce of Left Ventricular Volume to Exercise stress testing in Patients with Ischemic Heart disease. -Assesed by Radionuclide technique and Dye dilution technique- M. Shimizu,Y.Udaka,K.Yamada,Y.Yumura,T.Mizuno, .Saito and Y.Inagaki.The 3rd Dpt. of Internal Med., Chiba Univ. K.Akezuma. Dpt. of Radiology, Chiba Univ. T.Ookubo,T.Kawamoto. Toshiba Medical.

For evaluating the change of left ventricular volume during the ergometric exercise testing in supine position, we studied 20 normal healthy subjects and 32 patients with ischemic heart disease (IHD), who developed ischemic ST depression in exercise ECGs.

Left ventricular ejection fraction (EF) was obtained by Nuclear Stethoscope (Bios).

Cardiac output was obtained by dye dilution method. Left ventricular end-diastoric volume index (EDVI) was calculated from next equation.

EDVI=[(CARDIAC CUTPUT/HEART RATE)/EF]/ BODY SURFACE AREA

In the IHD patients, EDVI increased and EF decreased during exercise. While in normal subjects, EDVI was almost unchanged and EF increased in early stage of exercise.

Radionuclide technique, conbined with dilution method, may be useful for evaluating cardiac performance in cardiac patients.

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LOCAL CHANGES IN VENTRICULAR VOLUME AND MYOCARDIAL THICKNESS ACCOMPANYING SYSTOLE AND THEIR CONTRACTION CONTOURS. A.Asahara, Y.Honma, Y.Oasa, S.Tachibana, M.Togin, K.Kaneko and H.Ueda. Central Hospital of J.N.R., Tokyo.

We produced multi-gated images of both the Tl-201 myocardial image and the cardiac blood pool image recorded in the same posture and we also recorded the ventricular volume curve based on the 3-dimensional analysis method. At the same time we determined the thickness of the myocardium for each image from the difference between the contours of the myocardial image and the blood pool image. We measured myocardial thickness during each phase radially from the center of the ventricular cavities and vertically in respect to the long axis of the left ventricle and for each region we expressed as a curve the temporal changes in myocardial thickness accompanying systole (myocardial thickness curve). The volume curve and the myocardial thickness curve showed a practically inverse relationship. The time phase of increasing myocardial thickness occurred rapidly near the apical region but was observed to slow down on approaching the basal region well reflecting the nature of increasing intracardial pressure whose amplitude of increase was greatest in the lower part of the external wall. This finding was most distinctly recognized using the determination method of myocardial thicknass whereby the thickness is measured radially from the center of the ventricular blood pool. Althouth it is difficult to determine the contours of the myocardium at the focus of a myocardial infarct, to the extent it is possible, almost no changes are observed in myocardial thickness accompanying the changes in volume so that an irregular myocardial thickness curve was displayed indicating a reduction in contractile ability.

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THE USEFULNESS OF THE MEAN LEFT VENTRICULAR VOLUME CHANGE DETECTION IN THE EVALUATION OF THE CORONARY ARTERY DISEASE. S.Kinoshita,M. Ide,T.Ra,Y.Hoshino,Y.Dohi,M.Mashimo,T.Kato, K.Nishimura and T.Miyamae. Saitama Medical School. Saitama.

We investigated the change of the left ventricular(LV) counts collected for a given time during exercise and recovery. Nine patients of coronary artery disease(CAD), which composed of two or three vessels disease, and six normal subjects(NL) underwent exercise radionuclide ventriculography. The counts were collected using LFOV scintillation camera and analysid by Scintipack 1200 computer system. The left ventricular ROI(LVROI) counts and the back ground(BG) counts were stored every 30 seconds by image mode or 2 minutes by list mode. The LVROI counts stored for a given time minus BG counts for the same time are the LV counts for that time and its correspond to the mean LV counts for that time. The LV counts are proportioned to the LV volume. In LVROI counts, 4/6 of the NL decreased, and 7/9 of the CAD increased the counts by exercise($p < 0.05$). In LV counts, all of the NL decreased, and all of the CAD increased by exercise($p < 0.001$). Our results show that very simple single plobe system for exercise nuclear ventriculography can be available. In conclusion, mean LV volume(counts) is the useful, simple parameter of the cardiac function in exercise nuclear cardiology.