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INVESTIGATION ON THE FRACTIONAL DISTRIBUTION OF CARDIAC OUTPUT IN VARIOUS EXERCISE STRESS TESTINGS USING Tl-201 WHOLE BODY SCINTIGRAPHY. Y. Kato*, K. Kaneko*, T. Sawano*, T. Furuta*, H. Kurokawa*, T. Shimokata*, T. Kiriyama*, M. Sakurai*, T. Kondo*, Y. Watanabe*, Y. Mizuno*, A. Takeuchi**, and S. Koga**. Internal of Medicine*, Radiology** School, Toyoake

We studied the body distribution of Tl-201 on exercise by Tl-Whole Body Scintigraphy (WBS), because Tl-201 was accumulated in proportion to the regional blood flow at the end of exercise. Exercise WBS was performed on 31 normal subjects, 23 patients with angina pectoris and 47 patients with myocardial infarction. Exercise testings were employed Master's double two-step test (M), supine and sitting ergometer stress testings (SU and SI). WBS was obtained using a gamma camera Omega 500 and analyzed by ADAC system IV. We estimated % Distribution (%D: the ratio of whole body counts to organ counts) from WBS. The following results were obtained. 1) In normal subjects. %D of the heart was similar at rest (R) and in various exercise stress testings. %D of the lung was $R > M > SU > SI$. %D of the thigh was $R < M < SU < SI$. 2) In 5 patients which were performed on the same duration of exercise. In SI, the heart and the lung indicated low %D and the thigh indicated high %D compared with SU. 3) Duration of exercise was significant positive correlation with %D of the thigh in both SU and SI. 4) Duration of exercise was negative correlation with %D of the lung in SU.

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EXERCISE INDUCED Tl-201 LUNG ACTIVITY COMPARED WITH HAEMODYNAMIC PARAMETERS DURING EXERCISE. M. Shimizu, A. Karaki, T. Ishikawa, Y. Yamazaki, T. Sano, Y. Furukawa, H. Tomiya, M. Tonooka, T. Saito, Y. Inagaki. The 3rd Dept. of Internal Med. Chiba University School of Medicine. N. Arimizu. Dept. of Radiology Chiba University School of Medicine.

To assess the haemodynamic background of exercise induced Tl-201 accumulation in the lung, 33 patients with ischemic heart disease were evaluated in symptom limited maximal exercise stress test using supine bicycle ergometer. An ordinary stress Tl-201 scintigram was taken 10 minutes after exercise and classified into 4 groups according to the intensity of lung activity by visual inspection. Haemodynamic parameters monitored during exercise include ECG, BP, cardiac output (dye dilution method). And these patients were subjected to another exercise test in same load on another day, in which the left ventricular ejection fraction (gated blood pool scintigraphy) and pulmonary arterial pressure (Swan-Ganz catheter) were measured. The high Tl-201 activity groups compared with lower activity groups had short exercise time, higher pulmonary artery pressure at peak exercise, lower left ventricular ejection fraction at both rest and peak exercise. It was suggested that increased lung activity of Tl-201 in exercise stress test may indicate pump failure of left ventricle.

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EVALUATION OF METHOXAMINE·DIPYRIDAMOLE THALLIUM-201 MYOCARDIAL PERFUSION IMAGING. T. Inoue, M. Kinoshita, M. Sawamura, K. Masuda, T. Suzuki, M. Motomura, K. Bito and S. Kawakita. Shiga University of Medical Science, Otsu and Takashima Hospital, Takashima.

Methoxamine·Dipyridamole (MDP) test, a new stress test, for thallium-201 myocardial perfusion imaging (Tl MPI) is performed and compared with exercise-Tl MPI. Dipyridamole (DP) test is also performed and compared with MDP test in terms of electrocardiographic findings and symptoms.

Fifteen patients with angina pectoris were studied and all of them had significant coronary stenosis documented by coronary angiography. MDP-Tl MPI protocol is a modification of DP-Tl MPI method described by Albro et al. and differs from it in that, before DP administration, methoxamine is infused until blood pressure is increased by 20 per cent. MDP-Tl MPI showed a redistribution pattern in 11 of 15 patients, whereas exercise-Tl MPI was positive in 9. MDP test was positive in 10 of 15 patients on electrocardiogram, while DP test was positive in only 5. Angina occurred in 14 patients during MDP test and 9 patients during DP test.

We conclude from this preliminary study that MDP-Tl MPI appears to be comparable to exercise-Tl MPI and MDP test is more sensitive than DP test in the detection of coronary artery disease.

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EVALUATION OF ANGINA PECTORIS WITH TRIPLE VESSEL CORONARY ARTERY DISEASE BY STRESS THALLIUM SCAN. S. Hamada, T. Nishimura, T. Uehara, K. Hayashida, T. Shimomogata, M. Saito and T. Sumiyoshi. National Cardiovascular Center, Osaka.

The value and limitation of stress thallium scan were evaluated in 33 patients with triple vessel disease (TVD). Stress thallium scan was performed immediately and 4 hours (delayed). In 30 patients with single vessel disease (SVD) of left anterior descending branch, 93% of diseased vessels were detected by both visual interpretation and quantitative analysis using washout rate. On the other hand, in patients with TVD, quantitative analysis detected 77% of the lesions, while the sensitivity was only 41% for visual interpretation. Visual interpretation correctly identified only 2 and quantitative analysis 18 of 33 patients with TVD, resulting insensitivity values of 6% and 55%, respectively. In both TVD and SVD, cases with no complete redistribution were observed in 45% and 57% respectively. Our observations suggest that it is difficult to detect all patients with TVD and differentiate between ischemia and infarction only by stress thallium scan.