1122

COMPARISON OF EXERCISE THALLIUM IMAGING AND RADIONUCLIDE ANGIOCARDIOGRAPHY IN DETECTING CORONARY ARTERY DISEASE.

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Thallium-201 myocardial perfusion imaging and radionuclide angiocardiography were performed at rest and during exercise in 37 patients with chest pain: 24 with angiographically documented coronary artery disease and 13 with normal coronary arteries. Submaximal graded bicycle exercise was used for both studies to assure identical exercise conditions. All thirteen patients without coronary artery disease had normal exercise regional wall motion, and 12 (92%) of these patients had normal exercise thallium images and at least a 5% absolute increase in ejection fraction during exercise. New exercise induced image defects, regional wall motion abnormalitied and abnormal ejection fraction response to exercise were detected in 21 (88%), 18 (75%) and 20 (83%) of the 24 patients with coronary artery disease respectively. The locations of regional wall motion abnormalities correlated closely with those of the thallium defects. However, three patients who had new perfusion defect of the postero-inferior wall during exercise demonstrated no regional wall motion abnormalities . The sensitivity of perfusion imaging tended to decrease in patients with three vessel disease. We conclude that both radionuclide techniques are useful for identifying coronary artery disease.

1123

THE EVALUATION OF THE COLLATERAL IN ISCHEMIA HEART DISEASE USING THE QUANTITATIVE METHOD OF SERIAL TL-201 MYOCARDIAL STRESS IMAGING.

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Serial TL-201 myocardial stress imaging(MSI) and coronary angiography were performed in six normal subjects and fourteen patients with coronary artery disease(CAD). In order to evaluate MSI quantitatively, the redistribution index(cRds02) was used. cRds02 showed the ratio of redistributed counts to maximal counts during two hours[cRds02={Cts0× WR02+(Cts2-Cts0)}/maxCts0](see to Radioisotopes Vol.30). Between cRds02 values of normal,1VD and 2,3VD groups, the differeces were significant satistically($p<0.01$). Between the level of coronary artery stenosis(CAS) and redistributed counts(cRds02) the correlation was not so good. But when CAD was classified by the existence of collateral, the level of CAS was correlated with redistributed counts without collateral. In CAD with collateral cRds02 values of severe CAS was decreased. In eight collaterals of nine collaterals in CAD, cRds02 was decreased, compared with estimated cRds02 in CAD without collateral.

In conclusion, the presence of collateral n CAD cases revealed that the collateral was major factor in the reduction of estimated redistributional counts in severe CAD cases.

1124

THALLIUM-201 MYOCARDIAL SCINTIGRAPHY ON CORONARY VASODILATOR, DIPYRIDAMOLE: ASSESSMENT OF REGIONAL CORONARY PERFUSION RESERVE.

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Thallium-201 myocardial scintigraphy on coronary vasodilator, dipyridamole was done to assess their coronary perfusion reserves in 51 patients with suspected angina pectoris. In comparison with coronary arteriography (CAG), sensitivity, specificity and accuracy of this method for 75% coronary stenosis were 0.70, 0.89 and 0.76 respectively. For further analysis, stenotic lesions on CAG were classified into the groups of three coronary vessesl and were compared with myocardial scintigrams. Sensitivity was 0.48, however specificity was 0.98, which was very high. From this result, it can be said that a decrease in thallium uptake on scintigram reflects the reduction of regional coronary perfusion reserve accurately. To assess individual stenotic lesion, detectability of the stenoses of left distal coronary artery was low. In 33 patients with coronary stenosis, 36% of them had chest pain and 55% had ST-T changes on ECG. These side effects disappered rapidly with intravenous injection of aminophylline, antagonist of dipyridamole.

In conclusion, Thallium-201 myocardial scintigraphy on dipyridamole is safe and accurate method to assess regional coronary perfusion reserve.

1125

QUANTITATIVE MYOCARDIAL SCINTIGRAPHY WITH TWO SEQUENTIAL ADMINISTRATION OF THALLIUM-201 IN PATIENTS WITH CORONARY ARTERY DISEASE.

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A new quantitative scintigraphic method with two sequential administration of thallium (Tl)-201 was employed to assess noninvasively the degree of "coronary reserve" by exercise stress. Thirty-eight subjects, 20 with significant coronary artery disease and 18 control subjects, carried out exercise test with initial exercise imaging which was obtained 9 min. after 1st Tl injection (3/4 of total dose). Second resting myocardial uptake was recorded after routine myocardial imaging and subtracted from the 3rd resting myocardial uptake which was recorded 9 min. after 2nd Tl injection (1/4 of total). Myocardial uptake during exercise vs. at rest was corrected by administration dose. Percentage increments of myocardial uptake by exercise with background correction was 88.9 $\pm$ 33.0% in control subjects and 21.5 $\pm$ 22.4% in patients with coronary artery disease (21.5 $\pm$ 22.4% in patients with angina pectoris and 39.8 $\pm$ 47.4% in patients with myocardial infarction) with significant difference between the two. Thus, this quantitative technique appears to assess "coronary reserve" as well as myocardial blood distribution.

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