

V1 SILENT ISCHEMIA IN PATIENTS AFTER UNCOMPLICATED MYOCARDIAL INFARCTION

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The purpose of this study was to determine the frequency and importance of silent ischemia in patients (pts) after the acute myocardial infarction (AMI) as well as to establish diagnostic and prognostic value of exercise stress test (EST), Holter (H) monitoring and thallium-201 (Tl) scintigraphy. All the three tests were performed 2-4 months following the AMI. The criterion for diagnosing myocardial ischemia on EST and H is 1 mm or more of horizontal or down-sloping ST depression. Additional criteria for Holter imply the ischemic episode should last one minute and be separated from other episodes by at least one minute. Planar thallium images were performed 5-10 minute after the stress test; the delayed images were obtained after 3-6 hours. Visual and quantitative methods were employed in the analysis of Tl-scintigraphy. Scintigraphy was considered positive if exercise-induced perfusion defects showed redistribution. The study included 74 asymptomatic patients after the AMI. The patients were divided into two groups by results of quantitative Tl-scintigraphy: Group I - 44 pts with silent ischemia, Group II - 30 pts without ischemia. In Group I, out of 44 pts, 9 had a positive exercise stress, 4 showed a painless ST depression on Holter and 7 had both tests positive, whereas 24 pts had only scintigraphy positive. In Group II one patient had positive EST and H. Sensitivity and specificity were determined by results of coronary arteriography performed on 33 pts: EST (Se=40%, Sp=80%), H (Se=21%, Sp=100%) and scintigraphy (Se=93%, Sp=80%). During the follow-up period lasting at least 12 months, in Group I 3 pts died, 1 developed a new myocardial infarction and 15 pts had painful ischemic occurrences. In Group II only 3 pts developed symptoms of angina pectoris. Tl-scintigraphy was the only non-invasive test showing significant correlation with the follow-up autocomes. The diagnostic and prognostic superiority of Tl-scintigraphy justifies its value as the initial screening method for all patients after the acute myocardial infarction. Holter did not show any additional contribution in relation to exercise stress test.

V2 A COMPARISON OF QUALITATIVE AND QUANTITATIVE ANALYSIS OF THALLIUM REINJECTION IMAGES

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It is well known that Tl-201 reinjection imaging contributes in verifying myocardial viability. 20 patients were studied, 4 females and 16 males, aged 43 to 67 years (average 56.5 years). In 6 patients coronary ischaemia was suspect clinically, while in the remaining 14 patients myocardial infarction was verified by ECG and enzymes at least three months earlier. One patient had previously undergone PTCA. 2 mCi of Tl-201 were injected during stress test on a treadmill (Bruce protocol). Imaging was started within 9 minutes of injection, and redistribution imaging was performed 4 hours after injection. All our patients had one or more persistent defects on stress-redistribution imaging. 1 mCi of Tl-201 was reinjected immediately following redistribution imaging and reinjection images were performed 30 minutes later. The studies were analyzed qualitatively and quantitatively by two independent observers. Altogether, there were 28 irreversible defects on stress-redistribution scintigraphy. On qualitative analysis 10 of 28 (36%) showed an increase in Tl-201 uptake, while 18(64%) showed no changes. Quantitative analysis showed 4 (14%) defects with an increase of thallium uptake after reinjection, while 24 (86%) of irreversible defects in stress-redistribution imaging showed no change. The qualitative analysis is superior as compared to quantitative because of the problems related primarily to the background correction on reinjection images.

V3 FOURIER ANALYSIS OF HEART SPECT SLICES: FROM REMODELATION TO FUNCTION?

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The aim of this study was to determine character of the spatial distribution of marked erythrocytes in heart chambers, lungs and great blood vessels in relation to function of the left and right heart.

Investigation included total of 142 subjects, 28 of which were without subjective and clinical signs of heart disease as well as 56 after myocardial infarction (30 of anterior localization, 26 of inferior infarction), 35 with predominant left heart disease (aortic valve disease, dilatative cardiomyopathy, etc.) and 23 with predominant right heart disease (atrial septal defect, mitral valve disease).

Radionuclide ventriculography (RNV) at rest, and thorax SPECT were performed in all subjects with 740 MBq ^{99m}Tc after in vivo erythrocyte labelling with pyrophosphate. Ultrasound investigation was performed on all the subjects with heart disease and 87 of them underwent invasive cardiac investigation. RNV analysis revealed scintigraphic data on left and right ventricle: global ejection fraction (GEF), end-systolic volume (ESV), end-diastolic volume (EDV), fast filling rate (FFR), fast emptying rate (FER) as well as regional wall motion shortening. Reconstruction of 64x64x8 SPECT images resulted in 3x64 slices (transversal, coronal and sagittal slices). Fourier analysis of 20-32 reconstructed slices in all three dimensions gave amplitude image of the intensity distribution of marked erythrocytes in heart chambers, lungs and great blood vessels as well as phase display of spatial localization of regional amplitude values. Results of joint ROC curves constructed for detection, localization and character of heart disease in all subjects revealed significant clinical information content of SPECT data. Evaluation of RI retention using amplitude images in 3D provides insight in regional changes of volume, particular for atrial and lung involvement.

V4 VIP/SOMATOSTATIN RECEPTOR SCANNING

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Various tumors co-express specific receptors for VIP (vasoactive intestinal peptide) and somatostatin. We found that VIP may bind to somatostatin receptors with considerable affinity indicating K_d and IC_{50} values in the lower nanomolar range. Vice versa, also somatostatin recognizes VIP receptors. On this basis we developed the novel ¹²⁵I-VIP receptor scanning technique using a very high specific activity (200 MBq; less than 300 picomoles VIP/patient; dissolved in 3 milliliters NaCl 0.9%). After intravenous injection, the lungs were the primary organ of VIP in vivo-binding. In patients with adenocarcinomas of the intestine (gastric, pancreatic, colonic, rectal adenocarcinomas) as well as in patients with endocrine tumors (carcinomas, insulinomas, VIPomas) of the intestine, VIP receptor scanning provided excellent visualization of primary tumors and of spread metastases (liver, lung, lymph nodes). Tumors/metastases became visible during the early phase of 3 hours and remained usually visible up to 24 hours after i.v.-injection. The results obtained in 200 patients with intestinal adenocarcinomas and endocrine tumors, metastatic melanomas, lymphomas and Kaposi sarcomas are discussed. In conclusion, our novel VIP/somatostatin receptor scanning technique might be of advantage over CT scanning, especially in patients with tumors of the intestine.