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Sympathetic Reinnervation in Cardiac Transplants: ^{123}I-MIBG and ^{201}Tl/^{99m}Tc-MIBI Scintigraphy

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The purpose was to evaluate cardiac sympathetic reinnervation and hemodynamic changes after orthotopic heart transplantation(TPL). **Methods:** We performed 24 serial or followup cardiac 123I-MIBG imaging and rest 201Tl/99mTc-MIBI dipyridamole stress gated myocardial perfusion SPECT(g-MPS) in 15 patients (M:F=10:5; mean ages=34.5±13.0 yr; idiopathic:rheumatic=14:1; one heart lung TPL)(10.80±11.88(1-48) mo) after TPL 123I-MIBG imagings were performed in anterior position 15 minutes, 4 and 24 hours after i.v. injection of 148 MBq 123I MIBG. Image quantitation was based on the ratio of heart to mediastinal MIBG uptake(HMR). Results: Compared to HMR on 15 min images(1.48±0.28), neither four nor 24 hour delayed images (1.26±0.23 vs. 1.06±0.26: p<0.05, respectively, ANOVA) showed definite delayed localization of MIBG. 12 subjects with <13(4.9±3.7) months after TPL had no visible 123I-MIBG uptake on early 15 min imaging however, 12 subjects with 13 to 48(28.6±12.8) months had visible cardiac 123I-MIBG uptake (HMR:1.65±0.21 vs. 1.32±0.26; p=0.002). One-year followup 123I-MIBG scintigraphy in nine pts showed significantly increased HMR(1.40±0.31 to 1.61±0.16, p<0.05) but a plateau was reached at HMR value of 2.0, which was still lower than 3.0 in normal controls. Plasma NE was increased according to I-123 MIBG myocardial uptake. Annual G-MPS detected an allograft atherosclerosis in one pt and showed progressive normalization of tachycardia and significant deterioration of LVEF and cardiac indices according to severity of rejection. To dipyridamole stress, transplant hearts showed significant subnormal hemodynamic responses. Conclusion: Partial sympathetic late reinnervation can occur >1 year after TPL, and reached a plateau of two-third of normal value. G-MPS seems to be a useful screening test for the detection of allograft atherosclerosis and rejection.

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A Comparison of ^{99m}Tc-MIBI Myocardial Perfusion Imaging and Electron Beam CT in Detection of CAD in Patients without Myocardial Infarction

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Background: Our previous researches have demonstrated that ^{99m}Tc-MIBI myocardial tomography (SPECT) has higher specificity in detection of coronary artery disease (CAD) than that of coronary artery calcification (CAC) assessed by cardiac electron beam CT (EBCT). However, these researches involved patients with myocardial infarction, which may be in favor of obtaining high accuracy for detection of CAD by SPECT. The purpose of this study was to compare SPECT with EBCT in detection of CAD in patents without myocardial infarction history. **Methods:** Seventy-three patients (55 male, 18 female, 52.6±10.6 yrs old) without myocardial infarction underwent stress-rest SPECT, cardiac EBCT and coronary angiography (CAG) within one month. CAC as CT value≥130 HU within the boundary of coronary artery on EBCT, and ≥50% coronary narrowing was considered as diagnostic standard of CAD. **Results:** There were 35 patients and 38 patients with and without ≥50% coronary stenosis, respectively. Ninety-six percent (23/24) patients with abnormal SPECT and CAC detected by EBCT had coronary arteries with ≥50% stenosis, and 90.5% (19/21) patients with normal SPECT and EBCT had normal CAG or <50% coronary stenosis. The specificity of SPECT (92.1%) for detecting CAD was significantly higher than that of EBCT (55.3%), P<0.005, and the sensitivity of SPECT was comparable to that of EBCT. In detection of individual coronary artery stenosis, both sensitivity and specificity of SPECT (75.0% and 93.7%) were significantly higher than those of EBCT (53.3% and 76.7%), P<0.025 and <0.005, respectively. In patients without typical angina pectoris, the sensitivity and specificity of SPECT (76.9% and 91.4%) were significantly higher than those of EBCT (23.1% and 69.0%) in detection of ≥50% coronary stenosis, P<0.01 and <0.005, respectively. However, in patients with typical angina pectoris, the sensitivity and specificity of SPECT were comparable to those of EBCT. In patients ≤45 yrs old, the sensitivity of SPECT (77.8%) was significantly higher than that of EBCT (27.8%) in assessing ≥50% stenosis, in patients >45 yrs old the specificity of SPECT (94.3%) was significantly.