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DIAGNOSTIC VALUE OF LEFT VENTRICULAR FUNCTION OF POST-STRESS AND AT REST IN THE DETECTION OF MULTI-VESSEL CORONARY ARTERY DISEASE AS ASSESSED BY LOW-DOSE PROTOCOL USING CADMIUM-ZINC-TELLURIDE CAMERA

Poster Contributions
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Background: Few studies performed quantitative analysis of left ventricular (LV) function of post-stress and at rest to detect extensive coronary artery disease (CAD) according to the type of stress as assessed by low-dose protocol using cadmium-zinc-telluride (CZT) camera.

Methods: 182 patients with suspected or known CAD underwent 1-day low-dose stress /rest (185/370MBq) Technetium-99m SPECT using a Discovery NM 530c (65 with exercise, 117 with ATP). Image acquisition time was a 10-min for stress and a 6-min for at rest. All of the patients underwent coronary angiography within 3-months of MPI. To determine cut-off values of myocardial perfusion scores, functional parameters for multi-vessel disease (MVD), a receiver-operating characteristic curve analysis was performed according to the type of stress.

Results: In 103 patients with MVD, summed stress score (SSS:12.8±8.4 vs 8.0±7.0; p <0.0001), summed difference score (SDS:5.3±5.7 vs 1.8±4.4; p <0.0001) were greater, post-stress increase in end-diastolic volume (EDV) (3.8±6.7 vs 0.3±7.8 ml; p <0.001), post-stress increase in end-systolic volume (ESV) (5.1±5.7 vs 1.8±5.5 ml; p <0.0001) and decrease in ejection fraction (-3.7±5.1vs -1.9±4.1%; p <0.03) were larger than in 79 patients with insignificant or single-vessel CAD. In patients with exercise stress, the multivariate discriminant analysis revealed that the combination of post-stress increase in EDV ≥2 ml, SSS ≥8 best identified MVD, with 55% sensitivity, 94% specificity and 77% accuracy (chi-square=23.5), whereas the SSS showed a 83% sensitivity, 60% specificity and 70% accuracy (chi-square=12.8). In patients who underwent ATP-loading as the stress method, the combination of post-stress increase in ESV ≥5 ml, SSS ≥6 and SDS ≥2 best identified MVD, with 81% sensitivity, 50% specificity and 69% accuracy (chi-square=27.6), whereas the SSS and SDS showed 82% sensitivity, 48% specificity and 69% accuracy (chi-square=12.3).

Conclusion: Using the low dose protocol of CZT camera with 555 MBq of technetium radiotracer, the addition of LV volumetric analysis on conventional perfusion analysis may identify patients with MVD, regardless of the type of stress method.