E34
RELATIONSHIP BETWEEN REVERSIBILITY SCORE ON CORRESPONDING LEFT VENTRICULAR SEGMENTS AND FRACTIONAL FLOW RESERVE IN CORONARY ARTERY DISEASE
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Background: Currently the indication of percutaneous coronary intervention is based on the fractional flow reserve (FFR) in the intermediate coronary stenosis. It is a simple, reliable and reproducible method, but it does not take into consideration the localisation of stenosis. The aim of this study was to find correlation between the severity of perfusion abnormality detected by scintigraphy and the FFR value as well as the localization of a particular coronary lesion.

Material and methods: 28 patients (male: 22, female: 6, age 62 ± 7.62) were enrolled our retrospective analysis. The supplied left ventricular segments on the standard 17-segment polar map were rendered to each coronary branch. FFR measurements on 36 vessels (20 LAD, 6 Lcx, 10 RCA) were compared with the myocardium perfusion SPECT studies performed before the invasive procedure. The lesions belonged to 6.47 ± 2.47 myocardial segments (range: 1–12). We introduced a new ischemic index by combining the FFR with the number of the corresponding myocardial segments (left ventricular ischemic index: LVI). This index was correlated with the regional myocardial perfusion defects identified on the scintigrams.

Perfusion reversibility score of 2 or above was considered as indicative of active ischemia (regional Difference Score: ΔScc). Results: 13 lesion proved to be significant based on intra coronary pressure measurements (FFR < 0.75) which ones supplied 92 left ventricular segments. 50 segments showed reversibility out of the 92 segments (ΔScc: 76). The remaining non-significant 23 FFR values (> 0.75) corresponded to 138 LV segments (ΔScc: 21). Close linear relationship was found between the LVI and the ΔScc (p < 0.001). Also a linear relationship (p < 0.001) could describe the connection between the FFR and the ΔScc among the lesions with less-associaated myocardial territory of similar extensions (7–8 segments). Analyzing all the FFR values independently of the localization of the lesions, they also correlated significantly to the ΔScc but the relation was less tight. LVI predicted active ischemia (> 2) δScc myocardial scintigraphy with 77.8% sensitivity and 94.4% specificity when the cut off value was set to 0.96. FFR alone predicted the ischemia on the scintigraphy with 72% sensitivity and 94% specificity at the best 0.8 cut off value. The area under the Receiver Operating Characteristic (ROC) curve was significantly higher for LVI than FFR (0.92 vs. 0.78, p = 0.03).

Conclusion: The isotope data indicate that LVI > 0.96 associates clinically relevant stenotic lesion. In our opinion, the FFR value not alone, but together with the corresponding left ventricular segments should be taken into consideration for the correct clinical decision making.

E36
DIAGNOSTIC VALUE OF QUANTITATIVE ANALYSIS OF MYOCARDIAL PERFUSION SPECT IN DETECTING REVERSIBLE PERFUSION DEFECTS
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Background: to determine the positive predictive value (PPV) of myocardial perfusion scintigraphy (MPS) using quantitative parameters compared with coronary angiography (CAG) findings as gold standard and to analyze false positive cases.

Material and methods: During a one-year period 253 patients with known or suspected coronary artery disease (CAD) had perfusion defect on Tc99m-tetrofosmin stress-rest MPS in our department. A quantitative software (Cedars-Sinai QPS-OGS score values) was used to evaluate perfusion defects. Severity and extent of stress perfusion defects were quantified by summed stress score (SSS), and reversibility by summed difference score (SDS) using a normal data base. Tissue attenuation correction was not applied. 86 of these 253 patients were investigated by invasive CAG within 1 month after MPS. 52 patients had significant coronary artery stenosis. PPV of reversible perfusion defects was determined in this group retrospectively.

Results: In patients without significant coronary stenosis on CAG (n = 34, false positive MPS) SSS was significantly less, than in patients with significant stenosis (n = 52, true positive MPS), 9.5 ± 5.02 vs. 14.0 ± 9.12. The difference is statistically significant (p = 0.03). There was no significant difference between SSS values of the two groups (5.0 ± 3.98 vs. 6.0 ± 2.89, p = 0.82). But if MPS was considered to be positive only with SDS equal or above 4, number of false positive results decreased from 34 to 12, and PPV increased from 62% to 86%. Majority of false positive perfusion defects (84%) were also present on inferior wall of the left ventricle.

Conclusion: According to our results, use of a higher cut-off value for significant perfusion defect is recommended to reduce the number of false positive cases, especially in case of inferior location. Evaluation of SSS value can help to avoid false positive MPS results.