ADDITIVE VALUE OF QUANTITATIVE PERFUSION PARAMETERS OF CARDIAC POSITRON EMISSION TOMOGRAPHY IN THE DETECTION OF FUNCTIONALLY SIGNIFICANT CORONARY STENOSIS

Moderated Poster Contributions
Non Invasive Imaging Moderated Poster Theater, Poster Hall B1
Saturday, March 14, 2015, 4:00 p.m.-4:10 p.m.

Session Title: Clinical Applications of PET for Quantification of Myocardial Perfusion
Abstract Category: 19. Non Invasive Imaging: Nuclear
Presentation Number: 1162M-05

Authors: Chee Hae Kim, Bon Kwon Koo, Ji-Hyun Jung, Eun-Seok Shin, Minseok Suh, Gi Jeong Cheon, Jin Chul Paeng, Jung-kyu Han, Han-Mo Yang, Kyung Woo Park, Dong-Ju Choi, Hyo-Soo Kim, Byung-Hee Oh, Young-Bae Park, Seoul National University College of Medicine, Seoul, South Korea

Background: Cardiac positron emission tomography (PET) can provide both qualitative and quantitative perfusion data.

Methods: In 184 vessels, resting and stress myocardial blood flow, and coronary flow reserve (CFR) were measured with N-13 ammonia PET. Qualitative assessment was performed by the visual estimation of relative perfusion abnormalities. Invasive fractional flow reserve (FFR) was measured in all vessels and FFR criterion of 0.75 was used to define the presence of myocardial ischemia.

Results: Of total 184 vessels, 28 vessels (13.7%) were ischemic. Average stress flow, rest flow, coronary flow reserve and FFR were 2.07 mL/min/g, 0.94 mL/min/g, 2.28 and 0.84, respectively. Relative qualitative assessment detected myocardial ischemia with sensitivity, specificity, and diagnostic accuracy of 68%, 75%, and 74%. When quantitative measurements of PET was added to qualitative assessment, area under the curve (AUC) was increased from 0.72 to 0.96 (p<0.0001). Sensitivity, specificity, and diagnostic accuracy were also increased to 82%, 94%, and 93%, respectively. Adding quantitative data for the diagnosis ischemia improved reclassification over relative uptake abnormalities (net reclassification improvement 1.47, p<0.001, integrated discrimination improvement 0.48, p<0.001).

Conclusion: Quantitative blood flow data significantly improved the diagnostic performance of cardiac PET in the detection of myocardial ischemia compared to the relative uptake assessment.

![Graph showing improved reclassification over relative uptake](image-url)