were reconstructed as color maps. 33 patients in the 105 patients were also performed SPECT-MPI. Diagnostic accuracy was assessed by comparison with invasive coronary angiography.

**Results:** First-pass CT-MPI at rest in combination with CTA increased diagnostic performance compared with CTA alone. With per-vessel analysis, the sensitivity, specificity, positive predictive value, and negative predictive value increased from 83% to 88%, from 89% to 96%, from 63% to 72%, and from 96% to 97%, respectively. The area under the receiver operating characteristic (ROC) curve for detecting CAD also increased from 0.860 to 0.900 (p = 0.03). There was no significant difference in the area under the ROC curve between CTA in combination with first-pass CT-MPI and stress SPECT-MPI (0.86 vs. 0.80, p=0.24 based on a per-vessel basis and 0.79 vs. 0.76, p=0.92 on a per-patient basis). In addition, first-pass CT-MPI at rest was particularly useful for assessing unevaluateable segments by CTA alone owing to severe calcification and motion artifacts.

**Conclusion:** First-pass CT-MPI at rest thus complements CTA for detecting CAD.

---

**897 I BEDSIDE**

**Impact of anatomical and functional severity of coronary atherosclerotic plaques on the transmural perfusion gradient:** a H215O PET study

I. Danan1, P.G. Rajmakers2, H.J. Harms2, M.W. Heymans2, N. Van Royen1, A.A. Lammetsma2, M. Lubberink3, A.C. Van Rossum3, P. Knaapen4, 1VU University Medical Center, Department of Cardiology, Amsterdam, Netherlands; 2VU University Medical Center, Department of Nuclear Medicine & PET, Amsterdam, Netherlands; 3VU University Medical Center, Department of Epidemiology and Biostatistics, Amsterdam, Netherlands; 4Uppsala University Hospital, PET Center, Uppsala, Sweden

**Purpose:** Myocardial ischemia occurs principally in the subendocardial layer, whereas conventional myocardial perfusion imaging provides no information on the transmural myocardial blood flow (MBF) distribution. Therefore, the aim of the current study is to determine the impact of lesion severity as assessed by the fractional flow reserve (FFR) on the transmural perfusion gradient (TPG) using H215O positron emission tomography (PET) imaging in patients evaluated for coronary artery disease (CAD).

**Methods:** Sixty-six patients evaluated for CAD were prospectively enrolled and underwent H215O PET imaging for quantification of TPG. Subsequently, invasive coronary angiography was performed and FFR obtained in all coronary arteries irrespective of the PET imaging results.

**Results:** Thirty (45%) patients were diagnosed with significant CAD (i.e. FFR ≤ 0.80), whereas on a per vessel analysis (n=198), 53 (27%) displayed a positive FFR. Hyperemic MBF decreased significantly from 3.0.9 ± 1.16 to 1.67 ± 0.57 ml/min-1 g-1 (p < 0.001) in nonischemic and ischemic myocardium, respectively. The TPG decreased during hyperemia as compared with baseline (1.20 ± 0.14 vs. 0.94 ± 0.17, p < 0.001), and was lower in arteries with a positive FFR (0.97 ± 0.16 vs. 0.88 ± 0.18, p < 0.01). A TPG threshold of 0.94 yielded an accuracy to detect CAD of 98%, which was inferior to transmural MBF with an optimal cutoff of 2.20 ml/min-1 g-1 and an accuracy of 85% (p < 0.001).

**Conclusions:** Cardiac H215O PET imaging is able to detect TPGs and demonstrates a significantly lower hyperemic TPG in ischemic myocardium. However, the diagnostic accuracy of TPG seems to be limited compared to quantitative transmural MBF.