

Assessment of Myocardial Viability Using NH₃/FDG PET in Patients with Diabetes and Ischemic Cardiomyopathy

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Purpose: Metabolic imaging with FDG has shown to be useful in the assessment of myocardial viability in patients with ischemic cardiomyopathy. However, FDG PET is dependent on substrate availability and hormonal level, and experience in diabetes is limited. The purpose of this study was to evaluate the predictive accuracy of reversible LV function by NH₃/FDG PET in patients with diabetes and severe LV dysfunction

Method: The study population consisted of 7 patients with diabetes and severe multivessel coronary artery disease (LVEF of less than 30%), who underwent NH₃/FDG PET prior to CABG. Left ventricle was divided into 13 segments, and myocardial uptake of NH₃ or FDG in each segment was graded. Tissue viability was assessed by the combined interpretation of perfusion and metabolism. Uptake pattern of individual artery territory was classified as normal, mismatch or match according to segmental uptake patterns. Regional and global LV function were determined with echocardiography prior to and after CABG.

Result: Preoperative wall motion of 19 vascular territories was akinetic in 3, severe hypokinetic in 11, mild hypokinetic in 4, and normal in 1 territory. Postoperative wall motion was severe hypokinetic in 5, mild hypokinetic in 5, and normal in 9 territories. According to patterns on NH₃/FDG PET, 8 were classified as mismatch, 10 as normal, and 1 as match. Of 18 vascular territories with abnormal preoperative wall motion, regional wall motion improved in 6 of 8 mismatch (75%) and 5 of 9 (56%) normal territories resulting in sensitivity of 100%. In 1 territory with perfusion and metabolism match, there was no improvement of regional wall motion. The LVEF improved from $26 \pm 2\%$ (mean \pm SD) to $43 \pm 4\%$ in all 7 patients ($p < 0.001$)

Conclusion: Despite of the referral bias and small number of patients, these data suggest that FDG PET has comparable predictive accuracy of regional and global wall motion improvement after CABG in patients with diabetes.