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Reversible defect of ^{123}I-15-(*p*-iodophenyl)-9-(*R,S*)-methylpentadecanoic acid indicates residual viability within infarct-related area

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To evaluate the relationship between the reversible defect of ^{123}I-15-(*p*-iodophenyl)-9-(*R,S*)-methylpentadecanoic acid (9MPA) and residual viability within an infarct-related area, we performed resting single photon emission computed tomography (SPECT) with 9MPA and positron emission tomography (PET) with ^{18}F-deoxyglucose (FDG) and ^{13}N-ammonia (NH_3) in 7 patients with prior myocardial infarction.

9MPA-SPECT was obtained 2 min (early) and 50 min (delayed) after tracer injection. Tomographic images of the left ventricle were divided into 13 segments to correlate the regional uptake of each tracer. Residual viability within an infarct-related segment was confirmed by NH_3- and FDG-PET. Twenty-six infarct-related segments, confirmed by NH_3-PET, showed reduced uptake of 9MPA on early images. In these 26 segments, 6 showed reversible defect of 9MPA and 20 showed fixed defect on delayed images. Residual viability was present in all segments exhibiting reversible 9MPA defect and 7 segments (35%) exhibiting fixed defect ($p < 0.05$). The sensitivity, specificity and accuracy of reversible 9MPA defect for the detection of myocardial viability were 46%, 100%, and 73%, respectively. Myocardial clearance of 9MPA was significantly slower in non-viable segments than in ischemic but viable segments ($4.9 \pm 5.1\%$ vs. $10.1 \pm 5.3\%$; $p < 0.05$).

These data suggest that a reversible 9MPA defect indicates residual viability within the infarct-related area.

Key words: ^{123}I-15-(*p*-iodophenyl)-9-(*R,S*)-methylpentadecanoic acid, reversible defect, myocardial infarction, myocardial viability