

## Simultaneous assessment of Tc-99m-sestamibi and I-123-BMIPP myocardial distribution in patients with myocardial infarction: Evaluation of left ventricular function with ECG-gated myocardial SPECT

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<sup>123</sup>I-labeled 15-(p-iodophenyl)-3R,S-methyl pentadecanoic acid (BMIPP) is a branched-chain free fatty acid that is used to evaluate various cardiac diseases. The aim of the present study was to investigate the relationship between myocardial perfusion (<sup>99m</sup>Tc-sestamibi) and BMIPP uptake, and to correlate perfusion and metabolic alterations with regional left ventricular dysfunction in patients with myocardial infarction (MI). ECG-gated dual-isotope myocardial SPECT was performed on 130 patients with MI with sestamibi (555 MBq) and BMIPP (148 MBq). The patients were classified into 3 groups according to PTCA therapy and the interval between the onset of infarction and RI injection (OR time). Group A (n = 56) included patients whose OR time was less than one month and who had undergone successful PTCA, Group B (n = 36) had OR times of less than one month and had conservative medical therapy, and Group C (n = 38) had OR times of over one month. The severity scores of the dual-isotope images were calculated from the defect scores in 9 segments. From the ECG-gated SPECT data with sestamibi, the left ventricular ejection fraction (LVEF; %) and regional wall motion were determined automatically using the QGS program<sup>TM</sup>. LVEF obtained from gated SPECT correlated well with the severity scores for sestamibi and BMIPP (r = -0.68 and -0.76, respectively). The  $\Delta$  severity scores (BMIPP scores - sestamibi scores) of Group A were significantly higher than those of the other two groups ( $3.6 \pm 3.0$  vs.  $1.5 \pm 1.7$  and  $1.0 \pm 1.4$ ,  $p < 0.001$ ). The rate of dysfunctional segments with normal sestamibi distribution was significantly higher in Group A than in Group C (20.7% vs. 6.7%,  $p < 0.001$ ). ECG-gated dual-isotope SPECT is useful since myocardial perfusion, fatty acid metabolism and left ventricular function can be analyzed during a single examination, so that this procedure has the potential to provide comprehensive information when evaluating patients with ischemic heart disease.

**Key words:** <sup>99m</sup>Tc-sestamibi, <sup>123</sup>I-BMIPP, dual-isotope SPECT, gated SPECT, myocardial infarction