

## Assessment of contractile response to dobutamine stress by means of ECG-gated myocardial SPECT: Comparison with myocardial perfusion and fatty acid metabolism

Shin-ichiro KUMITA,\* Keiichi CHO,\* Hidenobu NAKAJO,\* Masahiro TOBA,\* Yoshimitsu FUKUSHIMA,\* Sunao MIZUMURA,\* Junko SANO,\*\* Teruo TAKANO\*\* and Tatsuo KUMAZAKI\*

*\*Department of Radiology and \*\*First Department of Internal Medicine, Nippon Medical School*

The present study assessed left ventricular performance during dobutamine stress measured using gated SPECT, and compared the results to myocardial perfusion and fatty acid metabolism. **Methods:** Thirty-six patients with myocardial infarction given  $^{99m}\text{Tc}$ -sestamibi or  $^{99m}\text{Tc}$ -tetrofosmin were examined by gated SPECT at rest and during dobutamine stress ( $4\text{--}20 \mu\text{g}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ ). After acquiring data at the highest dose,  $^{201}\text{TlCl}$  was injected and dual-isotope SPECT was performed to assess myocardial ischemia. Thirty of 36 patients also underwent myocardial SPECT with  $^{123}\text{I}$ -BMIPP. Regional wall motion changes during dobutamine infusion were determined from the gated SPECT data and classified as: (1) Improvement, (2) Worsening, (3) No change, and (4) Biphasic response. For myocardial segments of each infarct area, stress  $^{201}\text{Tl}$ , rest  $^{99m}\text{Tc}$  and  $^{123}\text{I}$ -BMIPP uptakes were graded on a five-point scoring system of defects from 0 (normal) to 4 (grossly defective). **Results:** Rest  $^{99m}\text{Tc}$  defect score index (DSI) in No change area was significantly higher than that in Biphasic area. The  $\Delta\text{DSI}$  (stress  $^{201}\text{Tl}$  – rest  $^{99m}\text{Tc}$ ) in Biphasic area was significantly higher than those in Improvement and No change areas. The  $\Delta\text{DSI}$  (BMIPP –  $^{99m}\text{Tc}$ ) in Worsening area tended to be higher than that in No Change area. **Conclusions:** Regional contractile response to dobutamine stress analyzed by gated SPECT showed that the response in myocardial infarct areas could be classified by rest and stress myocardial perfusion and BMIPP accumulation.

**Key words:** dobutamine, gated SPECT, myocardial infarction, fatty acid metabolism