ORIGINAL ARTICLE

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Impact of endothelial dysfunction on left ventricular remodeling after successful primary coronary angioplasty for acute myocardial infarction —Analysis by quantitative ECG-gated SPECT—

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Background: We hypothesized that endothelial cell integrity in the risk area would influence left ventricular remodeling after acute myocardial infarction. ***Patients and Methods:*** Twenty patients (61 ± 8 y.o.) with acute myocardial infarction underwent ^{99m}Tc-tetrofosmin imaging in the sub-acute phase and three months after successful primary angioplasty due to myocardial infarction. All patients were administered angiotensin-converting enzyme inhibitor after revascularization. Cardiac scintigraphies with quantitative gated SPECT were performed at the sub-acute stage and again 3 months after revascularization to evaluate left ventricular (LV) remodeling. The left ventricular ejection fraction (EF) and end-systolic and end-diastolic volume (ESV, EDV) were determined using a quantitative gated SPECT (QGS) program. Three months after myocardial infarction, all patients underwent cardiac catheterization examination with coronary endothelial function testing. Bradykinin (BK) (0.2, 0.6, 2.0 μg/min) was administered via the left coronary artery in a stepwise manner. Coronary blood flow was evaluated by Doppler flow velocity measurement. Patients were divided into two groups by BK-response: a preserved endothelial function group (n = 10) and endothelial dysfunction group (n = 10). ***Results:*** At baseline, both global function and LV systolic and diastolic volumes were similar in both groups. However, LV ejection fraction was significantly improved in the preserved-endothelial function group, compared with that in the endothelial dysfunction group (42 ± 10% to 48 ± 9%, versus 41 ± 4% to 42 ± 13%, $p < 0.05$). LV volumes progressively increased in the endothelial dysfunction group compared to the preserved-endothelial function group (123 ± 45 m*l* to 128 ± 43 m*l*, versus 111 ± 47 m*l* to 109 ± 49 m*l*, $p < 0.05$). ***Conclusion:*** In re-perfused acute myocardial infarction, endothelial function within the risk area plays an important role with left ventricular remodeling after myocardial infarction.

Key words: endothelial function, myocardial infarction, SPECT, ventricular remodeling, coronary flow reserve