IMPACT OF ST SEGMENT RE-ELEVATION AT REPERFUSION ON MICROVASCULAR OBSTRUCTION AND LEFT VENTRICULAR DILATATION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Background: Previous studies have reported that ST re-elevation at reperfusion is a sign of limited myocardial salvage by thrombolysis in patients with acute myocardial infarction (AMI). On the other hand, it has been reported that even if successful percutaneous coronary intervention (PCI) is achieved in epicardial coronary arteries, microvascular obstruction causes insufficient reperfusion of the infarcted myocardium, leading to left ventricular (LV) dilatation. The purpose of this study was to examine the effects of ST re-elevation on the microvascular damage and LV dilatation.

Methods: Two hundred and eleven consecutive patients with first anterior AMI who underwent successful PCI were subjected to coronary flow measurement with a Doppler guidewire. The coronary flow velocity spectrum provided the following parameters: systolic peak velocity (SPV) and diastolic deceleration time (DDT). We defined the presence of microvascular obstruction as DDT of ≤ 600 ms and the presence of systolic flow reversal. Left ventriculogram obtained 6 months after the infarction was analyzed to measure the LV volume index. Additional ST-segment elevation (>2 mm) immediately after PCI, in the absence of mechanical obstruction, was defined as ST re-elevation. Patients were divided into the two groups: those subsequently complicated by ST re-elevation and those without ST re-elevation.

Results: As for the relationship between the ST re-elevation and the severity of microvascular damage, additional ST-segment elevation was associated with a significantly higher risk of microvascular obstruction (66/77 patients, 86% vs. 23/134 patients, 17%; p<0.05). Patients with ST-segment re-elevation group had a significantly shorter DDT and a significantly lower SPV (365±176 vs. 698±197 ms, p<0.05 and -23±18 vs. 8±21 cm/s, p<0.05, respectively). Patients with ST-segment re-elevation group had a significantly larger LV end-diastolic volume index at 6 months after the infarction (115±23 vs. 85±19 ml/m², p<0.05).

Conclusions: Patients showing ST-segment re-elevation immediately after PCI are associated with microvascular obstruction and LV dilatation in patients with anterior AMI.