

Determinants of impaired microcirculatory resistance in patients with ST-Segment Elevation Myocardial Infarction

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**Purpose:** We aimed to seek the clinical and angiographic predictors of microvascular dysfunction by using the index of microcirculatory resistance (IMR) in patients with ST-segment elevation myocardial infarction (STEMI).

**Methods:** We enrolled 113 patients with STEMI (age,  $56 \pm 11$  years; 95 men) who underwent primary percutaneous coronary intervention (PCI). The IMR was measured with a pressure sensor/thermistor-tipped guidewire after primary PCI. The patients were divided into 3 groups based on the IMR value: Low IMR ( $< 18$  U, [ $12.9 \pm 2.6$  U],  $n = 38$ ), Mid IMR (18-31 U, [ $23.9 \pm 4.0$  U],  $n = 38$ ), and High IMR ( $> 31$  U, [ $48.1 \pm 17.1$  U],  $n = 37$ ).

**Result:** The age of the Low IMR group was significantly lower than that of the Mid and High IMR groups. The door-to-balloon time was  $< 90$  minutes in all patients, and it was not significantly different between groups. However, the symptom-onset-to-balloon time was significantly longer in the High IMR group compared to the Mid and Low IMR groups ( $p < 0.001$ ). In the high IMR group, the culprit lesion was found in a proximal location significantly more often than in a non-proximal location ( $p = 0.008$ ). In multivariate regression analysis, age and symptom-onset-to-balloon time were independent determinants of a high IMR ( $p = 0.013$  and  $p = 0.003$ , respectively).

**Conclusion:** Our data suggest that in STEMI patients with a door-to-balloon time of  $< 90$  minutes, age and symptom-onset-to-balloon time might be the major predictors of microvascular dysfunction.