Percutaneous Cardiopulmonary Support Experience of a National University Hospital in Busan

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Background: Cardiopulmonary support has been used to treat the patients with refractory cardiogenic shock since 1950s. In advent of portable system its use has been widened considerably. In this retrospective study, we report our single center experience concerning possible indications, complications and outcomes of percutaneous cardiopulmonary support (PCPS).

Methods: From January 2013 to March 2014, we searched the patients who were supported by PCPS system by reviewing the medical records in cardiology department at our Hospital. Infectious organism was limited to what was identified within 2 weeks after weaning of PCPS.

Results: A total of 9 patients were supported by PCPS with CAPiox CX® system (Terumo inc., Tokyo, Japan) initially for STEMI/NSTEMI in 4 patients, myocarditis in 3 patients, valvular heart disease in 1 patient, and acute respiratory distress syndrome (ARDS) in 1 patient. And in 4 patients, cardiopulmonary resuscitation was done before PCPS. The mean duration of PCPS support was 79.1±76.6 hours and 5 of them were recovered and discharged alive. All the patients needed transfusions of various forms of blood products, especially 3 patients occurred major bleeding. And there was one major stroke and one hyperbilirubinemia in relation to PCPS treatment. From blood culture, pathogens were detected in 2 patients.

Conclusions: PCPS treatment was a valuable means to treat the patients with cardiovascular collapse, but not without costs. It will need to configure the appropriate team for this treatment. Efforts to reduce its associated complications should be made to improve outcomes.

Determinants of Microvascular Dysfunction in St-Segment Elevation Myocardial Infarction

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Background: We sought to find differences of clinical and angiographic characteristics in St-segment elevation myocardial infarction (STEMI) patients with or without coronary microvascular dysfunction by index of microcirculatory resistance (IMR).

Methods: STEMI patients who underwent primary percutaneous coronary intervention (PCI) were enrolled. Baseline characteristics including clinical and angiographic characteristic were investigated in all patients. The IMR, parameter of hyperemic microvascular resistance, was measured with a pressure sensor/thermistor-tipped guide-wire after primary percutaneous coronary intervention (PCI).

Results: 113 STEMI patients (age=56±11 years, M:F=95:18) were enrolled and 113 culprit lesions of coronary artery were analyzed. The patients were divided into three groups based on following the value of IMR: Low-IMR (n=38, IMR=12.9±2.6 U), Mid-IMR (n=38; IMR=23.9±4.0 U) and High-IMR group (n=37; IMR=48.1±17.1 U). Mean age of Low-IMR was significantly younger than Mid-IMR and High-IMR. Mean door-to-balloon times were under 90 minutes in all IMR groups, and there were no significant differences among each IMR groups. However, symptom-onset-to-balloon time was significantly longer in High-IMR than Mid-IMR and Low-IMR (p=0.001). The high IMR group included the more frequent proximal location of culprit lesion than non-proximal location (p=0.008). In multivariate regression analysis, age and symptom-onset-to-balloon time were independent determinants of higher IMR (p=0.013 for age, p=0.003 for symptom-onset-to-balloon time).

Conclusions: Our data suggests that in STEMI patients with mean door-to-balloon time under 90minutes, age and symptom-onset-to-balloon time may be the main determinants of impaired microcirculatory resistance.