How Can We Improve Prognosis in Patients With Acute Myocardial Infarction?
– Lesson From Patients Without Primary Percutaneous Coronary Intervention –
Hideki Ishii, MD, PhD; Toyoaki Murohara, MD, PhD

It is noteworthy that the rate of primary percutaneous coronary intervention (PCI) for acute myocardial infarction (AMI) is quite higher in Japan than in other Western countries. In Japan, coronary reperfusion therapy with PCI has been the first choice for treating patients with AMI for approximately 20 years. Early reperfusion with primary PCI recovers epicardial blood flow, resulting in reduction of infarct size, prevention of left ventricular remodeling, reduction of in-hospital events, and better prognosis in patients with AMI. Recent Japanese studies have provided us important information on AMI cases, but most of them consisted of patients undergoing PCI. In contrast, there are limited data regarding Japanese AMI patients treated without PCI.

Figure. What can we do to improve treatment of acute myocardial infarction (AMI) in the acute phase? CCU, coronary care unit; ICU, intensive care unit; PCI, percutaneous coronary intervention.
Indeed, primary PCI is not performed in some cases for various reasons in the real world. In this issue of the Journal, Hao et al found that factors such as coexisting heart failure on admission, female sex, prior MI, older age, longer elapsed time from onset were associated with low performance rates of primary PCI. Many such factors are well known as related to no reperfusion therapy in AMI patients in Western countries. However, to the best of our knowledge, this is the first report featuring data regarding Japanese AMI patients without primary PCI in the stent era. Based on these findings, we have to consider what we can do for treatment for AMI in the acute phase (Figure).

The JCS guideline for the treatment of ST-elevation AMI recommends that AMI patients with severe congestive heart failure should be treated with primary PCI. The discrepancy between the real world and the recommended strategy in AMI patients with congestive heart failure should be elucidated. In general, patients with severe heart failure frequently need respiratory care and mechanical support such as intra-aortic balloon pumping and percutaneous cardiopulmonary support, which is labor intensive. Therefore, it may be difficult for limited medical staff in community-based hospitals to perform primary PCI in addition to invasive procedures in such critical situations. A similar possibility should be considered for the reason why a low rate of primary PCI was seen in AMI patients with night-time onset. Although Japanese cardiologists have done their best and have shown high performance even in critical situations, improvement in the medical environment such as an increase in the medical staff is needed for patients' care.

One of the important findings by Hao et al was the lower rate in female AMI patients compared with males. The reason for the phenomenon may be because of unique etiology such as a high frequency of coronary spasm or microcirculatory impairment in females. Myocardial ischemia because of coronary spasm is relieved by nitrates and calcium antagonists but not coronary revascularization. Unfortunately, coronary angiograms had not been performed in all enrolled subjects in the study by Hao et al. Further investigations are needed from this point of view.

One of the big problems in the clinical setting is that primary PCI cannot be performed because a long time has elapsed from the onset of AMI to diagnosis. Some acute coronary syndrome patients do not have typical symptoms, especially patients with diabetes, and chronic kidney disease, and the elderly. Early diagnosis may make primary PCI possible in such populations.

A recent study suggested that with age, the prevalence of diabetes and hypertension in AMI patents increase. On the other hand, patients aged <40 years often experience AMI in the clinical setting. Medical treatments such as statins and new antihypertensive agents are widely used, so the current clinical situation might have significantly changed over the past decade and therefore changes in the clinical characteristics of AMI patients during this long period should be evaluated. Thus, a large Japanese large registry of all patients with AMI is essential.

As described, introducing direct PCI initially improved clinical outcomes in patients with acute coronary syndrome. However, the in-hospital mortality rate has not significantly decreased in patients undergoing PCI for acute coronary syndrome over the past decade. To improve the prognosis of AMI patients, shortening the door-to-balloon time or onset-to-balloon time is essential. Moreover, it is important to make a prompt diagnosis and to determine whether or not invasive procedures are needed in such subjects.

References