

New Strategy to Prevent Acute MI in Japan



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Present Status of Acute MI Patients in Japan

Approximately 40,000 patients die from acute myocardial infarction (MI) in Japan every year according to the data from Vital Statistics 2014 reported by the Ministry of Health, Labor, and Welfare. However, the number of patients hospitalized due to acute MI is about 69,000/year, and the in-hospital mortality of those patients is below 10% according to the data from The Japanese Registry of all cardiac and vascular Disease (JROAD) reported by the Japanese Circulation Society. Therefore, approximately 34,000 patients with acute MI die before hospitalization every year and approximately 40% of acute MI patients die after onset mainly before hospitalization. Judging from these data, we should pay more attention to how to prevent acute MI rather than to how to treat acute MI patients in hospital to save their lives.

Process of Acute MI Onset

It is well known that the major cause of acute MI onset is thrombosis at the ruptured plaque that leads to the occlusion of coronary artery. However, there are many silent plaque ruptures [1] with mural thrombosis that heal without causing MI, which means that plaques rupture is not a key process but the formation of occlusive thrombus is the key process for the onset of acute MI [2]. The thrombogenicity of blood has been reported to be extremely but transiently high in the acute phase of MI patients [3]. Furthermore, it takes days to weeks from the beginning of thrombus formation caused by the ruptured plaque to the occlusion of coronary artery in about a half of acute MI patients, while it takes no more than 24 hours in the rest half of the patients [4]. Some patients have a symptom of unstable angina during the process of thrombus growth. This symptom would be a sign of acute MI onset in the near future.

According to the registry studies of acute MI patients in Japan, about 40-50% of hospitalized acute MI patients had pre-infarction angina within 30 days before the onset of MI. This percentage did not change during the past 10 years. The

most important thing is that those patients with a symptom of angina did not go to hospital at that time and suffered acute MI later. This symptom of pre-infarction angina is usually a chest pain, chest oppression, or heart burn of a short duration (a few minutes to 10 minutes). They usually do not think the symptom comes from heart and do not take it serious, thus, do not go to hospital.

Prevention of Acute MI by Treating Unstable Angina

As mentioned above, about half of hospitalized acute MI patients had a symptom of pre-infarction angina before the onset of MI, but did not go to hospital at the time. If we can treat all of them at the time of pre-infarction angina before the onset of MI, we can prevent them from suffering acute MI and reduce the incidence of acute MI into half in Japan. We can estimate that the number of hospitalized MI patients may be reduced by 34,500/year and the number of death from MI may be reduced by 20,000/year. Medication may also prevent them from suffering acute MI, but percutaneous coronary intervention with stenting may be more effective and reliable because the incidence of stent thrombosis is extremely low these days.

There may be some difficulties in the diagnosis of pre-infarction angina. Those patients often have normal electrocardiogram, negative troponin, and normal echocardiogram. In those cases, coronary CT is an effective method for correct diagnosis. We need to investigate the effective strategy to make correct diagnosis of pre-infarction angina when the patients with mild symptom of chest pain, chest oppression, or heart burn come to hospital.

STOP MI Campaign in Japan

The Japanese Circulation Society has just started "STOP MI Campaign" to educate people about pre-infarction angina and encourage them to go to hospital when they had a suspicious symptom. We can reduce the number of acute MI patients into half without any development of drugs or devices. This

situation may apply to many countries, and thus, "STOP MI Campaign" should better be performed all over the world.

Summary

Acute MI is still a highly lethal disease these days, and about 40% of the patients who suffer acute MI die mainly before hospitalization. However, a half of those patients have a chance to prevent MI by treating coronary artery disease at the time they have pre-infarction angina days to weeks before the onset of acute MI. This pre-infarction angina may be a relatively mild chest pain, chest oppression, or heart burn of a short duration that may occur repeatedly. Those who have a suspected symptom should be diagnosed quickly, often by coronary CT, to receive a proper treatment without delay. The Japanese Circulation Society has just started "STOP MI Campaign" to educate people about this fact.

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