

[EDITORIAL]

Treatment of Young Women with Acute Myocardial Infarction

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In the past two decades, the proportion of acute myocardial infarction (AMI) hospitalizations occurring in young patients has increased, most pronouncedly among women in the United States. This trend parallels an increase in cardiovascular risk factors, including hypertension and diabetes mellitus, among young patients hospitalized with acute myocardial infarction (1). In that report, a young patient was defined as being 35-54 years old.

Kawaguchi et al. reported an unusual case of AMI in a 17-year-old girl (2). This case is very rare in that the etiology was atherosclerotic plaque based on multiple risk factors but without any history of congenital or anatomical abnormalities of vessels, myocardial bridge, vascular dissection, vascular spasms, or inflammatory diseases, such as Kawasaki disease. The patient's clinical course offers several instructive lessons. General physicians and cardiologists may not suspect AMI when examining a female teenager presenting with chest pain but without a major medical history, as teenagers so rarely develop AMI even with several risk factors. However, this 17-year-old girl with obesity, dyslipidemia, glucose intolerance, and smoking nevertheless experienced AMI. This surprising case may encourage us to consider 1) the pathophysiology of AMI in teenagers linking to the emergent treatment strategy (what is the mechanism of a vulnerable plaque established for only a few years with risk factors?), 2) when primary prevention for atherosclerotic coronary artery diseases should be started in teenagers (should strict control be implemented earlier than previously considered suitable?), and 3) optimal very-long-term secondary prevention measures (starting levels and goals may differ from those in the conventional guidelines).

There are two important issues that we should deal with when treating young women with AMI. First is the strategy of emergent treatment, including percutaneous coronary intervention (PCI). Nakashima et al. reported that in 130 women with AMI \leq 50 years old, atherosclerotic plaque was

found in 55 patients (42%) and spontaneous coronary artery dissection in 45 patients (35%) (3). The treatment strategy for these two etiologies differs. PCI may be recommended for a patient with atherosclerotic plaque, whereas conservative therapy preceding PCI may be used in cases of spontaneous coronary artery dissection. Therefore, the target lesion should be evaluated carefully with coronary angiography and intravascular ultrasound.

When PCI is performed, coronary stents should be implanted as infrequently as possible because metallic coronary stents may cause trouble when the patients undergo later surgical operations or become pregnant. In this particular case, a bare-metal stent was implanted. However, second- or third-generation drug-eluting stents (DESs) have yielded more beneficial outcomes than bare-metal stents, including a reduction in stent thrombosis rates. The ideal strategy for PCI may be a balloon-alone strategy incorporating a drug-coated balloon (DCB). Non-stent-based local drug delivery by DCB was investigated because it leaves no metallic mesh (4). DCBs have many advantages over DESs, not only because they leave no metallic mesh but also because they ensure homogeneous distribution of the drug, promote positive remodeling of the vessel, and potentially require a shorter course of dual antiplatelet therapy.

Kimura et al. (5) reported that surgical procedures are commonly required after PCI using DESs (annual rate 5%). The cumulative incidence rates of surgical procedures were 5.1% at 1 year, 10.2% at 2 years, and 14.7% at 3 years. A significant number of patients with DES implantation might be concerned about the risk of coronary events following future anti-platelet discontinuation. That concern might be eradicated by the application of balloon-alone PCI with a DCB, which would also be expected to prevent the neoatherosclerosis that occurs after DES implantation (6).

Thus, balloon-alone PCI using a DCB may improve the quality of life and long-term prognosis of patients post-PCI,

especially those who are young. Accordingly, several clinical trials of DCBs for large vessels are currently being conducted.

The second issue that should be considered when encountering young women with AMI is the preventive strategy. The present world guidelines are based on data from middle-aged or older men with AMI. However, the etiology and clinical course of AMI differ to some degree between men and women, and women with AMI may have additional risk factors aside from the traditional risk factors of men. Young women, especially those who have suffered AMI, have a more adverse sociodemographic and psychosocial profile than similarly aged men (7). Therefore, an integrated, multifaceted new approach may be needed to promote effective primordial, primary, and secondary prevention strategies among at-risk women.

The authors state that they have no Conflict of Interest (COI).

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