Takotsubo (Ampulla) Cardiomyopathy is Not Rare in Taiwan

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A number of reports in Japan[1,2] during the past decade and in these 3 years in Europe[3] and the United States[4] described a unique syndrome characterized by clinical features mimicking acute myocardial infarction (AMI). Takotsubo cardiomyopathy (CM) is a novel heart syndrome characterized by transient and severe left ventricular (LV) apical ballooning and basal hyperkinesias in acute stage.[1] Because the shape of the LV resembles a round bottom and narrow neck bottle used in Japan for trapping octopus, the disease is called takotsubo CM, derived from the Japanese words tako, meaning octopus, and tsubo, meaning bottle.[1] Doctors also call this disease ampulla or amphora CM.[1] At present, due to the results from many studies[5-8] the most likely mechanism for this syndrome is activated myocardial adrenergic nervous system stimulated by acute and marked stress in this particular group of patients, with discrepant adrenergic innervations distributed in the apex of LV triggers for this novel cardiac syndrome.

In the face of establishing a completely novel disease or syndrome, the diagnostic criteria should be strict, the definition should be narrow sense and it should conclude with gene study. Kawai et al and the Takotsubo CM Study Group in Japan established the first set of guidelines for diagnosis of takotsubo CM[9] and published them in 2007 in the official journal of the Japanese Circulation Society, *Circulation Journal*, including definition, exclusion criteria and references for diagnosis. The definition of takotsubo CM is a disease exhibiting an acute LV apical ballooning of unknown cause. There is nearly complete resolution of the apical akinesis in the majority of patients within a month. The contraction abnormality occurs mainly in the LV, but involvement of the right ventricle is observed in some cases. A dynamic obstruction of the LV outflow tract with pressure gradient difference, acceleration of blood flow, or systolic cardiac murmurs is also observed. Similar features with known cause should be excluded, i.e., significant organic stenosis or spasm of a coronary artery by emergent coronary angiogram (CAG), cerebrovascular disease, pheochromocytoma, and myocarditis. Patients with known cause such as acute cerebrovascular disease who have an apical systolic ballooning similar to that in takotsubo CM are diagnosed as "cerebrovascular disease with takotsubo-like myocardial dysfunction". References for diagnosis are as follows: (1) Symptoms: chest pain and dyspnea similar to those in acute coronary syndrome, but it can occur without symptoms; (2) Triggers: emotional or physical stress with predominantly emotional stress in females and physical stress in males, but it can also occur without any apparent trigger; (3) Age and gender difference: higher incidence in elderly females, 7-fold that of males; (4) Ventricular morphology: apical ballooning is seen on LV angiography and echocardiography with rapid improvement; (5) Electrocardiogram (ECG): ST-segment elevations might be observed immediately after the onset. ST-segment elevation persisted for several days in typical cases of takotsubo CM with a longer duration than that in the case of coronary spasm. The ST-segment elevations in Takotsubo CM usually occur in leads $V_{3\sim6}$ and often show concave in shape and are lack of reciprocal changes followed by T wave inversion and usually resolve in approximately 2-3 weeks. The T-wave becomes progressively more negative in multiple leads with even giant negative T-wave change and with QT interval prolongation. These changes improve gradually, but the negative T-wave may continue for several months. Abnormal Q wave and QRS voltage changes are not usually seen. However, during the acute stage, abnormal Q-waves and changes in the QRS voltage might be observed; (6) Cardiac biomarkers: in a typical case, there is modest elevation of serum level

of cardiac enzymes including troponin, with elevation not proportional to the large akinetic area; (7) Emergent CAG: lack of significant coronary artery stenosis with normal antegrade coronary flow and no spasm when the patient still complains of chest pain and ECG shows ST-segment elevation. Positive provocation test of coronary artery spasm is low; (8) Myocardial radionuclide study: abnormal findings in myocardial scintigraphy are observed in some cases; (9) Rapid normalization of the abnormal pattern of ventricular contraction, the ECG, cardiac enzymes, and the myocardial scintigram; (10) Serum catecholamine level: a few cases may have elevation in serum catecholamine level; (11) Prognosis: The majority of cases rapidly recover, but some cases suffer pulmonary edema, other sequelae or death. In severe cases, respiratory failure can occur, and fatal cases exist, for example, cardiac rupture.

There are two critical clinical implications: (1) Differential diagnosis between takotsubo CM and stenotic AMI is important when considering use of intravenous thrombolytic therapy in patients with no CAG confirmation; (2) Identification of transient LV outflow obstruction may be important because this finding may predispose to apical ischemia, with eventual formation of an apical infarct.[2,10] Thus, the traditional strategies to treat ischemia, including nitrate and afterload vasodilator, may exacerbate the outflow tract obstruction and deteriorate the condition of the patient with takotsubo CM. Beta-blocking agent and intravenous fluid may be helpful and life-saving.[11] There are two important unanswered clinical problems: Should aspirin be administrated indefinitely, and can minor tranquilizer prevent the attack and recurrence?

Up to the present time, takotsubo CM has been very rarely reported in Taiwan; to our knowledge, only 6 cases have been reported.[12-17] We estimate takotsubo CM is not rare in Taiwan even if recruiting typical cases only. Emergency room physicians and cardiologists should take notice in daily practice for early suspicion and confirmation of diagnosis.[18,19]

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