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Editorial

Stress echocardiography causes stress cardiomyopathy: A very rare complication should be reminded

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Dobutamine stress echocardiography (DSE) is widely used for detection and risk stratification of patients with coronary artery diseases [1]. Recent advances both in stress protocol and digital imaging allow us more accurate assessment using DSE [2]. Dobutamine stress has been regarded as safe with few adverse events. Geleijnse reported major complications of dobuamine–atropine stress echocardiography in 116 patients or 0.2% among 55,071 patients [3]. The most common arrhythmic complication is atrial fibrillation. In a recent large cohort with 11,806 patients, 0.5% of patients developed atrial fibrillation which terminated within a day in most of the cases without serious cardiac events [4]. Even though the incidence is not frequent, complications may result in a serious morbidity or mortality. The most life-threatening complication of DSE is ventricular tachycardia which occurred in 0.15% of patients.

The present article written by Ho et al. [5] reported a case of Takotsubo cardiomyopathy (TCM) following DSE. TCM or transient apical ballooning is known as a stress-induced acute myopathy which is most likely to affect elder female patients as in the present case [6]. Psychiatric as well as physical stresses are the cause of TCM. Medical or dental procedures can also trigger this syndrome [7]. TCM mimics the symptoms and STT findings of ST elevation acute myocardial infarction. Compared to anterior acute myocardial infarction, TCM is associated with ST depression in aVR lead and lack of ST elevation in V1 lead [8]. Even though, the difference in the distribution of ST elevation, the most specific finding of TCM is the wall motion abnormality without coronary stenosis. About 80% of TCM develops apical ballooning with hyperkinetic motion of basal walls. However, several patterns of wall motion abnormality can be seen in TCM, such as biventricular, midventricular, and basal wall of left ventricle [9].

Several cases with TCM following DSE have already been reported (Table 1) [5,10–13]. All of the cases were elder females. Most of the patients developed TCM during the peak dobutamine at a standard dose, with or without atropine. Management of TCM is rather supportive when the hemodynamics show stability. Beta blockers could be considered if left ventricular outflow obstruction occurs. However, physicians should be cautious about the possibility of multivessel spasm before starting beta blockers in Japanese patients.

It is known that catecholamine levels are elevated in patients with TCM, suggesting increased synthesis or reuptake and decreased removal of catecholamines [14]. However, it is not certain that exogenous catecholamine infusion causes TCM. A clue might be in the fact that some patients developed TCM at the recovery period of DSE despite showing normal wall motion during peak stress such as in the present case [15]. It is also known that neuropsychiatric complications can be seen following DSE. Neuropsychiatric symptoms include confusion, memory disturbance, and disorientation, which occurred in 7.1% of patients within 24 h after DSE [16]. Not the dose of dobutamine but atropine use was the strongest predictor of neuropsychiatric symptoms. Underlying neuropsychiatric disease was also a predictor of these complications after DSE. These results suggested that patient's anxiety and agony during DSE might be a trigger of neuropsychiatric reaction following DSE.

What should we do to avoid TCM following DSE? Probably we should pay much attention to choose the stress methods and protocol after assessing the patient's characteristics, especially in the case of elderly ladies. We should also take much care of patients who demonstrate anxiety or agony during DSE by gentle explanation. Moreover, we should remind ourselves of the possibility of TCM even during the recovery period after DSE.

Table 1
Reported cases of takotsubo cardiomyopathy following DOB stress.

Author	Year	Age	Gender	Peak DOB	Atropine	Phase
Silberbauer	2008	75	Female	30	0.5 mg	Peak
Cherian	2008	85	Female	40	No	Peak
Margey	2009	61	Female	40	No	Peak
Mosley	2010	50	Female	30	0.5 mg	Peak
		74	Female	40	0.25 mg	Peak
Shah	2011	85	Female	30	No	Recovery
Ho	2012	83	Female	40	0.5 mg	Recovery

DOB, dobutamine (mcg/kg/min).

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