

Letter to the Editor

Controversy regarding the disease taxonomy of Takotsubo syndrome: pathophysiological, morphological and anatomical considerations

Dear Editor,

The current literature has stirred up controversy regarding the myocardial infarction with non-obstructive coronary arteries (MINOCA) and the Takotsubo syndrome (TTS) definition and classification^{1,2}. Several recent studies^{1,2} include TTS in the subgroups of MINOCA.

A working diagnosis of MINOCA should only be considered in patients with a definite acute myocardial infarction (defined according to the fourth universal definition of myocardial infarction), non-obstructive disease on coronary angiography, and no other clinical entities that would lead to myocardial injury without ischemia³. On the contrary, the universal definition of myocardial infarction does not consider TTS a myocardial infarction³. TTS is classified clearly as a myocardial injury and consequently is categorized separately for uniformity³. MINOCA is a distinct clinical diagnosis with many different pathophysiological causes³. Healthcare professionals must become familiar with these syndromes so that patients are appropriately identified and treated³.

As stated by the expert consensus document from the European Society of Cardiology (ESC), the universal definition of myocardial infarction suggests that the diagnosis of MINOCA, like the diagnosis of myocardial infarction, shows that there is an ischemic mechanism responsible for the myocyte injury³. Specifically, the MINOCA term has been conceived for a group of myocardial infarction patients with no angiographic obstructive coronary artery disease ($\geq 50\%$ diameter stenosis in a major epicardial vessel)³. MINOCA provides a clinically useful framework and algorithms for the diagnostic evaluation and management of patients with myocardial infarction without obstructive coronary artery disease³.

According to the International Expert Consensus Document on Takotsubo Syndrome, TTS is a distinct morphological manifestation of stress cardiomyopathy⁴. It is characterized by a temporary wall motion abnormality of the left ventricle, electrocardiographic alterations that masquerade (but are not) those of acute myocardial infarction, and minimal release of myocardial enzymes in the lack of an occluded coronary artery⁴. Consequently, the term MINOCA does not apply to TTS.

The clinical presentation of TTS is suggestive of an acute coronary syndrome (ACS), but TTS is defined by catecholamine-induced acute transient left ventricular apical ballooning⁴. This distinctive pattern of ventricular wall-motion abnormality in TTS is consistent with the distribution of cardiac nerves mapped by the anatomist and neurologist Antonio Scarpa⁵. Although TTS can clinically mimic MINOCA, it appears to be a distinctly different syndrome and should be considered separately³.

The pathophysiology of TTS is still unknown⁵. Excessive cardiac neuronal and systemic catecholamines secretion leads to acute myocardial impairment in TTS subjects⁶. Moreover, reduced microvascular perfusion, myocardial inflammation, and electrophysiological abnormalities all add to the clinical symptoms of this condition⁶. Takotsubo stunning, which encompasses both catecholaminergic and ischemic mechanisms, is the pathophysiological framework underlying this syndrome, which is essential for implementing effective diagnostic and therapeutic techniques⁶.

TTS is an acute cardiac syndrome characterized by typical regional wall motion abnormalities indicative of myocardial contractility dysfunction that results in acute heart failure in the absence of culprit epicardial coronary artery disease⁶. TTS is an acute heart failure syndrome and not an ACS, like MINOCA. We must not overlook disease taxonomy, a cornerstone of medical research that has a pivotal role in designing the International Classification of Diseases.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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