

Takotsubo cardiomyopathy and the hope of specific biomarker

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In this edition of the Medical Journal of Indonesia, Mavridis et al¹ reported a rare case of takotsubo cardiomyopathy. In this case, a pneumothorax patients suffered continuous shortness of breath although pulmonary collapse has been relieved after sealed drainage. Specific ST-segment elevation on ECG along with elevation of troponin I, have led the physician to confirm diagnosis of myocardial infarction. This patient was finally presented to cardiac catheterization unit. However, no significant coronary artery stenosis was found. Diagnosis of takotsubo cardiomyopathy was finally established, and the patient underwent apical resection. The condition of patient improved within three days.

Tricky clinical manifestation of takotsubo cardio-myopathy and the lack of specific diagnostic modality are among interesting things to be raised in this issue. This disease entity has been documented as takotsubo (stress) cardiomyopathy in the literatures. It usually starts abruptly and unpredictably, with symptoms of chest pain and, often, shortness of breath, usually triggered by an emotionally or physically stressful event. Women is reported to be more prevalent, especially after 50 years of age and only 10% in men.^{2,3} Although no specific damage of cardiac muscle, manifestation of this disease much resembles heart attack, since the patient frequently presence with shortness of breath and chest pain. Elevated ST segment on ECG can be found, as well as specific cardiac enzyme as in this case report. In case of the absence of cardiac intervention facility, this case would have been treated specifically as myocardial infarction, since standard clinical diagnostic procedure fit with acute myocardial infarction.

Thinking about this case of missed diagnosis, the emergence of specific and sensitive biomarker is a hope for better future diagnostic procedure.

Concurrent with this hope, Kristyagita and Siswanto⁴ present their interesting review article on copeptin, the new cardiac biomarker with promising sensitivity and specificity for various cardiovascular diseases. Copeptin is a polypeptide cosecreted with arginine vasopressin from the hypothalamus.⁵ Although this biomarker has not yet widely accepted as standard diagnostic procedure, it give the hope since it has some advantages compared to troponin. Copeptin appears earlier in the circulation following myocardial infarction, has a good stability in the plasma and relatively simple in its preparation of essay. A clinical study in patients with acute chest pain, where copeptin, cTnT, CKMB, and myoglobin levels were analyzed at admission, 3 hours, and 6 hours, it was reported that plasma level of cTnT increase over time, while that of copeptin decreased over the same time.⁶ In addition, plasma copeptin in MI patients was five times higher than those with non-cardiac chest pain or unstable angina. The plasma level peaked in the first 3 hours of onset and subsequently declined. This indicates that copeptin is highly specific as biomarker for myocardial infarction. The authors concluded that copeptin combined with cTnT had the best diagnostic power compared with other combinations of biomarker.⁷

It is not easy to speculate what it would be if this new biomarker was applied in the case of previous patient with takotsubo cardiomyopathy. Regarding the absence of myocardial damage, we can expect that the copeptin level will not increase. However, considering hemodynamic changes during heart failure symptoms in takotsubo disease, the increase of this biomarker is highly possible, since copeptin is co-secreted with AVP and AVP itself is increased during acute and chronic phase of heart failure. The results are not easily predicted, since all theoretical hypothesis should ultimately be verified in clinical setting.

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