



Adiponectin and T-Cadherin: a Tree for Biomarkers in ST-Elevation or Non-ST-Elevation Myocardial Infarction

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Patients with suspected acute coronary syndromes (ACS) are differentiated based on their electrocardiogram (ECG) results as follows^{1, 2}: (1) ST-elevation myocardial infarction (STEMI): patients with acute chest pain and persistent (20 min) ST segment elevation indicating acute total coronary occlusion and generally requiring immediate reperfusion with primary percutaneous coronary intervention (PPCI) or (2) non-ST-elevation myocardial infarction (NSTEMI): patients with acute chest pain but no persistent ST-segment elevation and who may show a clinical spectrum from no symptoms at presentation to ongoing ischemia, electrical or hemodynamic instability, or cardiac arrest, indicating cardiomyocyte necrosis or less frequently, myocardial ischemia without cell loss (unstable angina).

In the therapeutic strategy for ACS, biomarkers may improve the diagnostic accuracy and risk stratification by clinical assessment based on ECG and identify subgroups of patients who would benefit from a specific therapeutic modality in the acute phase³. The new-generation cardiac troponin (cTn) assays, which reflect the presence of myocardial necrosis, provide considerably sensitive and specific diagnosis of ACS compared with less sensitive cTn and creatine kinase (CK) with its MB isoenzyme (CK-MB). The new-generation cTn assays reduce the proportion of cases with unstable angina and increase that of cases with NSTEMI in the patients with NSTEMI-ACS (**Fig. 1**). Consequently, this reclassification is believed to guide appropriate decisions of treatment. However, the long-term benefit of an invasive approach and its subse-

quent medical treatment in subgroups of patients reclassified from unstable angina to NSTEMI myocardial infarction has not been fully clarified (**Fig. 1**)^{3, 4}.

Meanwhile, the diagnosis and acute management of STEMI are considered to be simple compared with those of NSTEMI, with the main decision of whether to perform immediate revascularization, pharmacological or mechanical, solely based on ST-segment elevation and symptoms^{1, 2}. The prognosis of patients with STEMI who are promptly revascularized with PPCI is widely perceived to be good and is largely dependent on the efficacy of reperfusion and rescue of viable myocardial tissues. Although there is a striking decrease in acute mortality in patients with STEMI, an unacceptable rate of recurrent events still occurs after ACS including STEMI, prompting us identify biomarkers of STEMI⁴.

The current issue by Natsukawa *et al.* may provide an insight into a strategy for the diagnosis and risk stratification of STEMI⁵. In 49 Japanese subjects who underwent PPCI for STEMI, the area under the curve (AUC) for serum CK-MB levels was associated with serum adiponectin levels on admission and Δ serum adiponectin levels at the acute phase. The present study may indicate that serum adiponectin levels are useful in the prediction of prognosis after PCI-treated STEMI subjects.

Adiponectin, an adipocyte-specific secretory protein, abundantly exists in the blood stream. Serum adiponectin levels paradoxically decrease in patients with visceral fat obesity and are associated with endothelial dysfunction⁶, presence of ischemic heart diseases⁷, and complexity of coronary lesion⁸. The current study found that serum adiponectin levels decreased from admission to after 24 h and gradually recovered to baseline levels, and Δ serum adiponectin levels at the acute phase were negatively associated with serum AUC of CK-MB levels⁵, suggesting that accumulation or consumption of adiponectin in the local area at the risk for myocardial necrosis may protect from myocardial damage and result in the reduc-

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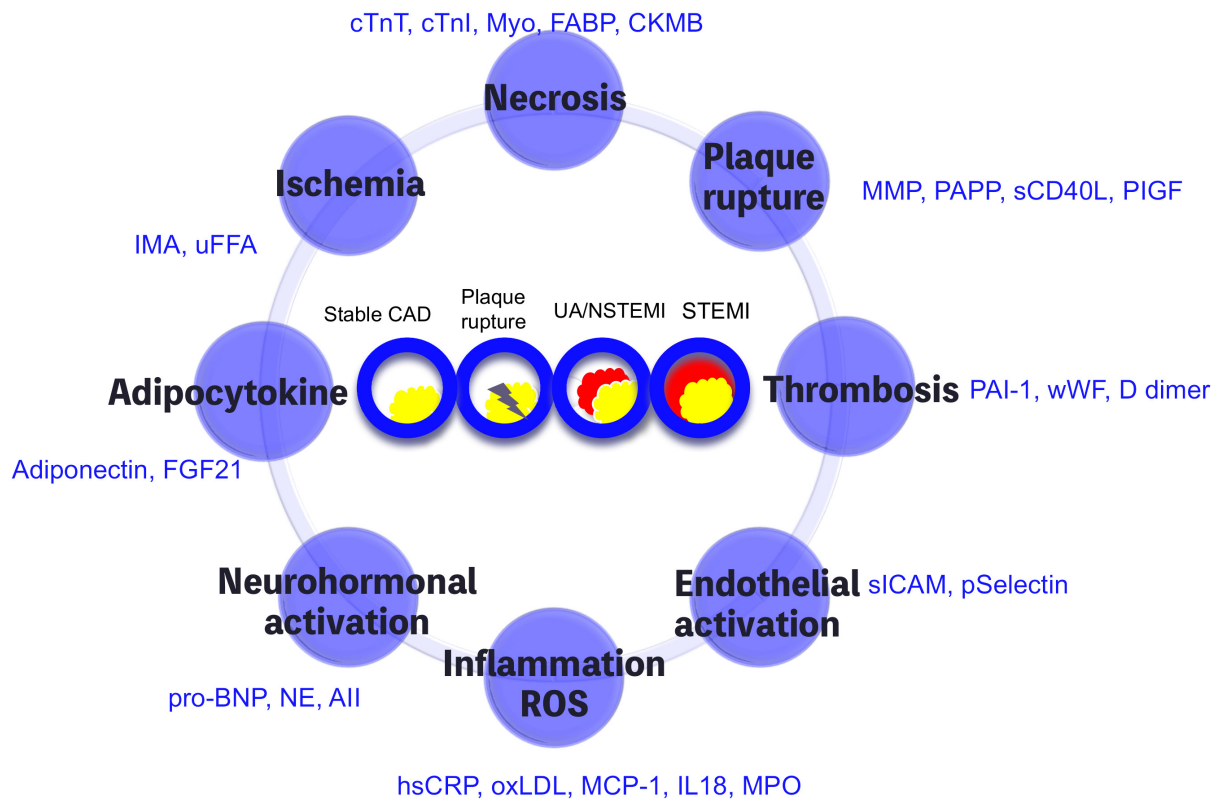


Fig. 1. Multiple biomarker strategy for acute coronary syndrome

Biomarkers for acute coronary syndrome are subgrouped into eight categories by modifying deLomos JA, University of Texas Southwestern at Dallas. CAD: coronary artery disease; UA: unstable angina; NSTEMI: non-ST-elevation myocardial infarction; STEMI: ST-elevation myocardial infarction.

tion of the infarct size. It has been reported that expression of protective effects of adiponectin in the cardiovascular system requires coexistence of T-cadherin⁹⁾. In a genome-wide association study based on independent cohorts, genetic variations in *CDH13* gene-coding T-cadherin influence circulating adiponectin levels and cardiovascular events¹⁰⁻¹²⁾. Thus, T-cadherin-mediated accumulation of adiponectin in the cardiovascular system may play a crucial role in cardiovascular events. Collectively, it can be suggested that accumulation or adhesion of adiponectin to the local ischemic area is critically operative via T-cadherin and the phenomenon is reflected by serial changes in serum adiponectin levels in patients with STEMI.

The introduction of new biomarkers has undoubtedly moved our approach several steps forward, but it also given rise to novel issues that need to be addressed by future research. Future analysis of serum and local dynamics of adiponectin at the acute phase of ACS may uncover pathophysiological perceptions in terms of accumulation or adhesion property of adiponectin, and large clinical trials may provide more persuading evidences showing that serial changes

in adiponectin are useful in the prediction of prognosis after PCI-treated STEMI subjects.

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