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EDITORIAL

Neuropeptides Y and Other Promising Biomarkers in Acute Coronary Syndrome

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Editorial referring to the article: Influence of Neuropeptide Y and Neuropeptide Y 2 Receptor Variants in Acute Coronary Syndrome

Neuropeptide Y (NPY) is a very common neurotransmitter with 36 amino acids that acts as a stimulator of angiogenesis, inflammation and adipogenesis through the NPY2 receptor.[1] The description of high plasma concentrations of NPY in acute coronary syndrome (ACS) and left ventricular dysfunction and its close relationship with the sympathetic nervous system reinforces the possibility of a new prognostic biomarker for risk stratification.[2,3]

In recent years, changes in the NPY signalling pathway have been related to ACS. For example, the NPYc.20T>C mutation is associated with increased serum lipid levels and consequent increase in the risk of ACS, stroke, hypertension, and obesity.[2,3] The NPYc.-485T>C variant has been linked to the development of early atherosclerosis and stroke, and possibly to insulin resistance reduction and development of type 2 diabetes mellitus.[4-8]

Soares et al.,[6] gathered genotypic data of four variants (c.20T>C/c.84G>A/c.150G>A/c.-485T>C) in the NPY gene and two variants (c.-1088C>T/c.-1116A>G) in the NPY2R gene of approximately 500 individuals to determine the correlation of these variants with ACS and TIMI risk.[6] Possibly, discrimination of individuals at intermediate from those at high risk and the correlation with clinical outcomes (morbidity and mortality) would allow a more robust inference of a causal link between variants in the NPY and NPY2R genes and cardiovascular events. Finally, further research is also necessary considering the high phenotypic heterogeneity among individuals and populations, and the potential variability in the association between gene variants and outcomes.[5]

The application of large-scale DNA sequencing methods for the analysis of molecular markers has led to an improvement in these techniques, and the development of larger studies have led to the discovery of new cardiovascular disease biomarkers,[9] including myocardial ischemia (Table 1). The clinical application of these biomarkers has been tested in different scenarios, and advances in genomic, proteomic and metabolomic analyses, with the integration of artificial intelligence, would provide better diagnostic and prognostic information.[10]

Keywords

Acute Coronary Syndrome; Neuropeptide Y; Receptors Neuropeptide Y; Nucleotide Polymorphism; Biomarkers; Obesity; Hypertension; Stroke; Mortality.

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Table 1 – Basic information on biomarkers of cardiomyocyte injury

BIOMARKER	DIAGNOSTIC/ PROAGNOSTIC	ORGAN/CELL OF ORIGIN	HALF LIFE
Troponin I, T	Diagnostic and prognostic	Cardiac thin filament	120 min
hFABP	Prognostic	Cardiomyocyte cytoplasmic protein	27 min
NT-proBNP	Diagnostic and prognostic	Cardiac ventricles	120 min
MR-proANP	Diagnostic and prognostic	Cardiac atrial tissue	60-120 min
CMyBP-C	Diagnostic	Cardiac thin filament	unknown
sST2	Diagnostic	Cardiomyocytes, cardiac fibroblasts, and vascular endothelial cells	unknown
GDF-15	Diagnostic	Multiple cells	unknown
Gal-3	Diagnostic	Multiple cells	unknown
Ceramides	Diagnostic and prognostic	Menbrane lipids	24-72 hours

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