Editorial
Volume 12:5, 2021

Journal of Molecular Biomarkers & Diagnosis

ISSN: 2155-9929 Open Access

Future of Biomarkers for Heart Failure

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Editorial

Heart failure, a serious and rising public health concern, believed to be caused by a complex interplay of genetic, neuro-hormonal, inflammatory, and metabolic alterations acting on cardiac myocytes, the cardiac interstitium, or both. Heart failure (HF) is often regarded as the last stage of all cardiovascular diseases. Heart failure (HF) is a life-threatening illness in which the heart is unable to pump enough blood and oxygen to sustain the body's other organs. Enzymes, hormones, biologic substances, and other biomarkers of cardiac stress and dysfunction, as well as myocyte injury—collectively known as biomarkers—appear to be gaining therapeutic value. Although biomarkers include genetic variants, clinical images, physiological tests, and tissue specimen biopsies, the focus of this review is on biomarkers derived from the blood or urine that are not serum levels of haemoglobin, electrolytes, liver enzymes, or creatinine, which are routinely determined as part of clinical care.

Chromogranin A, a polypeptide hormone generated by the myocardium that has significant negative inotropic effects and higher plasma levels in heart failure patients, is one of the biomarkers. Another is galectin-3, a protein generated by activated macrophages, whose plasma levels have been linked to poor outcomes in heart failure patients. The third is osteoprotegerin, a member of the tumour necrosis factor receptor superfamily that has been linked to the development of left ventricular dysfunction as well as the prognosis of individuals with heart failure following a myocardial infarction. Growth differentiation factor 15, a stress-response member of the transforming growth factor superfamily, also predicts mortality risk in heart failure patients and needs further investigation.

Proteomics, which involves analyzing proteins using mass spectrometry and high-pressure liquid chromatography, is expected to produce entirely new classes of biomarkers for heart failure. Large platforms that allow for the investigation of hundreds of proteins are anticipated to become accessible, potentially opening up new paths for early identification of ventricular dysfunction, understanding its pathophysiology, and monitoring heart failure treatments in novel ways.

How to cite this article: Rosie Carella. "Future of Biomarkers for Heart Failure." J Mol Biomark Diagn 12 (2021): 467.

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Received 11 May 2021; **Accepted** 18 May 2021; **Published** 25 May, 2021