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Role of Non-Coding RNA's as Myocardial Ischemia in Biological Markers

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DESCRIPTION

Non-coding RNAs (NCRNAs) are a type of RNA molecule that has tissue-specific expression but lacks protein-coding potential. A substantial body of evidence suggests that aberrant NCRNA expression is important in disease onset and progression. The biochemical properties of NCRNAs, such as disease-associated concentration changes, structural stability, and abundance in body fluids, make them promising prognostic and diagnostic biomarkers. Myocardial Infarction (MI) is the leading cause of death in the world. Physical examination, Electrocardiogram (ECG), and the presence of specific biomarkers are used to diagnose Acute Myocardial Infarction (AMI), the term used to describe the early stage of MI. In this regard, NCRNAs appear to provide better sensitivity and specificity than standard MI biomarkers such as Cardiac Troponin Isoforms (cTnT & cTnI) and Creatinine Kinase (CK), ensuring a rapid and correct diagnosis, earlier treatment, and thus a good prognosis for patients. Myocardial Infarction (MI) is a type of Cardiovascular Disease (CVD) that is on track to become the leading cause of death worldwide. MI is caused by a sudden and prolonged lack of oxygen and nutrients (Ischemia) to the heart muscle (Myocardium), resulting in myocardial damage and cardiac tissue death caused by a series of abnormal metabolic and biochemical events. MI, which is frequently caused by spasms or coronary atherosclerosis, is linked to a sedentary lifestyle, smoking, excessive alcohol consumption, and high cholesterol. Acute Myocardial Infarction (AMI) is the term used to describe the early stages of MI, which include numerous pathological changes such as ischemia, hypoxia, edoema, and necrosis. AMI is typically diagnosed through physical examination and Electrocardiogram (ECG), as well as the presence or absence of specific biomarkers. Biomarkers are biological molecules that identify a biological event or process. Because they can be quantified and are associated with normal and pathological processes or pharmacological therapy responses, they are primarily used to improve disease diagnosis and monitoring. For MI diagnosis, several types of cardiac biomarkers have been developed. These include I biomarkers originating from damaged myocardial tissues, such as Cardiac Troponin Isoforms (cTnT & cTnI), Creatinine Kinase (CK), Brain Natriuretic Peptide (BNP), or (ii) biomarkers released from non-myocardial tissues as a result of MI-induced system reactions, such as Vascular Endothelial Growth Factor (VEGF), Interleuk (circRNAs) NCRNAs appear to have higher sensitivity and specificity, resulting in a faster and more accurate diagnosis, earlier treatment, and, as a result, a better prognosis. Despite being overlooked for many years due to their lack of protein-coding potential, recent research has shown that NCRNAs are functionally active molecules that regulate gene expression at the epigenetic, transcriptional, and post-transcriptional levels. NCRNAs are classified into two types based on their Nucleotide (nt) number: I small NCRNAs (less than 200 nt) such as MicroRNA (MIRNA), Small Interfering RNAs (SIRNAs), Piwi-interacting RNAs (PIRNAs), and (ii) long NCRNAs (more than 200nt) MIRNAs are the most common type of small NCRNA and generally act at the RNA level by binding the 3'UTR of target mRNAs to destabilise and inhibit translation.

CONCLUSION

NCRNAs circulate in body fluids and extracellular space, acting as hormone-like messengers to regulate autocrine, paracrine, and endocrine communications.

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CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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