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Elucidating the Diagnostic Potential of miRNA in Coronary Artery Disease by Identifying Transcription Level Variations in Patients

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Abstract

Cardiovascular diseases are the leading cause of death worldwide with an annual death toll of 17.9 million. As per the report of the World Heart Federation 2023, 85% of cardiovascular-associated deaths are due to coronary artery disease and stroke. Coronary artery disease develops due to occlusion of the coronary arteries, causing inflammation, hypoxia, and apoptosis in cardiomyocytes. So, the development of an innovative diagnostic biomarker strategy for CAD is a need of time. miRNA profiling acts as an innovative, noninvasive, and disease-specific diagnostic biomarker. miR-1-3p is cardiac-specific and is involved in modulating proliferation and differentiation during cardiogenesis. In this study, we aimed to elucidate the potential of miR-1-3p in CAD diagnosis. The expression level of miR-1-3p was analyzed using real-time PCR followed by statistical analysis. Putative target gene analysis was also performed using TargetScan database. This study was conducted on whole blood samples of controls with <50% stenosis and CAD patients with >50% stenosis, as confirmed by angiography. Patients with CAD demonstrated significantly higher circulatory expression levels of miR-1-3p in contrast to controls. Bioinformatics analysis revealed an important 8-mer putative target gene of miR-1-3p likely to be involved in the dysregulated signaling pathways in CAD. Hence, it can be concluded that miR-1-3p may serve as an early, non-invasive, and cardiac-specific diagnostic biomarker for CAD with the potential to disrupt key signaling pathways in the pathological states.

Conflict of Interest:
All authors declare no conflict of interest.