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A STUDY OF COAGULATION, ADIPOGENESIS, AND CHOLESTEROL BIOSYNTHESIS PATHWAYS ASSOCIATED WITH CORONARY ATHEROSCLEROSIS

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ABSTRACT

Integrated systems analyses have helped to elucidate the molecular signatures, potential biomarkers, and therapeutic targets of CA. Elevated homocysteine leads to increased biosynthesis of lipids and cholesterol which are associated with the disease. Homocysteine is involved in the interruption of blood flow by inhibiting NOS which is essential for vascular function. Homocysteine also promotes blood coagulation. It is known to induce platelet degranulation via ADP to promote coagulation. Homocysteine is also known to promote oxidative stress by increasing the production of ROS. Herein we show that transcriptomic analysis of GEO dataset of cartilage from GEO database shows platelet aggregation, adipogenesis, and cholesterol biosynthesis. Based on analysis of our data and those published in the literature, we propose that anti-thrombotic agents and statins concomitant with vitamin B6, B12, and Folate might help in the better management of FHO. We performed differential gene expression analysis of gene expression microarray dataset of cartilage tissue of 12 CA patients compared to that of 12 healthy control samples that were available in the GEO database. Genes with adjusted p. value ≤ 0.05 were considered for further downstream analyses. Pathway enrichment analyses were carried out using the ClueGO plugin of Cytoscape. Reactome and Wikipathways databases were queried to obtain significant pathways and to construct pathway subnetworks. Our analysis showed enrichment of platelet aggregation, adipogenesis, and cholesterol biosynthesis pathways. We constructed the subnetworks of the pathways using the cluepedia plugin of Cytoscape and overlaid the expression values onto the subnetwork to visualize the differential expression.