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Metabolic syndrome, inflammation and biomarkers

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Abstract

The epidemic of obesity is linked to an increasing incidence of several chronic diseases, such as metabolic syndrome (MetS), type 2 diabetes (T2DM) and cardiovascular disease. MetS constitutes a constellation of cardio-metabolic risk factors including abdominal obesity, hyperglycemia, hypertension, dyslipidemia comprising high triglycerides (TG) and/or low levels of high density lipoprotein-cholesterol levels. 1 in 2 US adults have the MetS and it is growing at an alarming rate in adolescents. MetS constitutes an increased risk for both diabetes and cardiovascular disease. Oxidative stress is central to the pathogenesis of obesity and its related complications. In addition to systemic biomarkers of oxidative stress, cellular redox tone, inflammation, and energy metabolism are key regulatory pathways that are modulated by changes in cellular oxidative stress. Furthermore, both insulin resistance and low grade inflammation are common manifestations and could play a role in the pathogenesis of MetS and its sequelae. Multiple factors contribute towards MetS including central appetite dysregulation, genetic predisposition, dietary factors and lack of physical activity. Increased volume of adipose tissue also results in release of biomediators such as monocyte chemotactic protein (MCP-1) which induce macrophage infiltration in adipose tissue. Activated macrophages in the adipose tissue further trigger an inflammatory cascade. Several novel biomarkers have now been identified using metabolomics and include branched chain amino acids and other such biomolecules that could form the signature of the Metabolic Syndrome in individuals and could be used to target therapies to reduced the cardiovascular burden in these individuals.

Biography

Dr.Devaraj has completed her Ph.D in Clinical Biochemistry and is a Diplomate of the American Board of Clinical Chemistry. She is currently Medical Director of Chemistry at Texas Childrens Hospital and Professor of Pathology and Immunology at Baylor Collegeof Medicine. She has published more than 25 papers in reputed journals and serves on the Editorial Board of several journals and is Associate Editor of Atherosclerosis and Archives of Pathology and Laboratory Medicine.