Obesity is an imbalance between energy intake or lipogenesis / lipolysis in a narrow sense. The World Health Organization (WHO) reports that obesity has doubled in the past 30 years and is the most important health problem of the 21st century. The budget allocated to obesity constitutes 1-3% of health expenditures worldwide. WHO categorizes obesity based on Body Mass Index (BMI). According to this, overweight (BMI = 25.0-29.9 kg/m²) and obesity (BMI ≥ 30 kg/m²). As of 2008, the prevalence of overweight in the world is 35% and the prevalence of obesity is around 11%. Obesity is an epidemic disease that increases the incidence of type 2 diabetes, cardiovascular disease, stroke and cancer. Type 2 Diabetes is parallel to obesity in both sex and all ethnic groups and is closely related to the grade and duration of obesity. Increased visceral, subcutaneous and liver adiposity associated with obesity cause insulin resistance. Insulin resistance locally indicates a decrease in the insulin metabolic response of the target cell and a decrease in the effect of endogenous or exogenous insulin in order to reduce the circulating blood glucose level. Insulin resistance and hyperinsulinemia are accepted as the key event that obesity increases the risk of type 2 diabetes, hypertension, dyslipidemia and cardiovascular events. In the evaluation of obesity and diabetes; anamnesis, physical examination and laboratory are important places. Laboratory tests can be grouped into routine tests, glucose-insulin homeostasis, fat tissue markers, inflammation markers, and omics-based markers: Routine tests: Fasting plasma glucose, postprandial blood glucose, OGTT, HBa1C, lipid profile, uric acid, BUN and creatinine, Liver Function Tests (ALT, AST, GGT, ALP), and microalbumin in urine. Glucose-insulin homeostasis tests: Insulin, insulin-like growth factor and C-peptide. Fat tissue markers: Adiponectin, omentin, apelin, lepin, resistin and fatty acid binding protein-4. Inflammatory markers: C-reactive protein, interleukin-6, tumor necrosis factor-α. Omics-based markers: Metabolites and microRNAs. The number of biomarkers that can be used in diagnosis and treatment of obesity and diabetes is increasing day by day, bringing innovations in risk prediction, screening, diagnosis, and prognosis. However, biological variability and methodological variability are constraints on their use. When biological markers are used; reliability, validity, sensitivity, specificity and interpretation of data are important. Sample collection, storage and use should be standardized and their biological variability should be determined so that these markers can be appropriately verified and made available in the clinical setting. Nowadays, in the "personalized medicine" era, interest in New biomarkers specific to obesity and cardiometabolic diseases is increasing. Promising biomarkers are emerging, including adipokines, cytokines, metabolites and microRNAs.

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CLINICAL OBSERVATION OF BIODIVELUTE IN METABOLIC SYNDROME MONITORING

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Metabolic syndrome; abdominal obesity, insulin resistance, dyslipidemia, hypertension, hypofibrinolysis, inflammation and endothelial dysfunction, resulting in Type 2 diabetes and coronary heart disease. In the development of the metabolic syndrome; high fat and carbohydrate diet, physical inactivity, aging, genetic factors and perinatal malnutrition. Studies have shown that diabetes and insulin resistance and cardiovascular diseases follow each other, suggesting that these diseases may originate from the same root, and this common cause may be inflammation and oxidative stress. Metabolic syndrome is thought to be the most important factor that triggers inflammation and oxidative stress on the basis of genetic and metabolic susceptibility of overnutrition and obesity. A number of adipocytokines are normally secreted from adipocytes. When adipose tissue reaches a certain threshold level as it is obesity, adipocytes cause dysregulation of adipocytokine release. Accordingly, leptin, leptin / adiponectin ratio (LAO), PAI-1, uric acid, IL-6, TNF-alpha, oxLDL are increased while adiponectin, ghrelin, IL10 and PON1 are decreasing. Some ratios, such as high molecular weight adiponectin / adiponectin and leptin/adiponectin ratios, are more important than their individual values. A biomarker is a measurable variable that can be used as an indicator of a biological condition. Biomarkers can be used in diagnosis and treatment if there are no clear clinical signs and anatomical abnormalities in many pathologic conditions or if they are not definite. Biomarkers can also identify individuals susceptible to disease in the community; they can also determine the level of this predisposition. It is suggested that certain cytokines, which may increase their levels in metabolic syndrome, may be used as biomarkers in diagnosis or treatment. These levels of cytokines correlate with both cardiovascular disease and metabolic syndrome components.

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BIOMARKERS IN MOLECULAR NUTRITION: CLINICAL AND RESEARCH APPLICATIONS AND NEW TARGETS METABOLOMICS

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The rapid developments in molecular nutrition science in recent years show the importance of investigating the relationship between diseases and nutritional status of people. For this reason, epidemiology, nutrigenetics, nutrigenomics and related issues between nutrition and diseases are being investigated. The data obtained indicate that biomarkers need to be evaluated in areas such as nutrigenomics and metabolomics. Nutrients may affect directly or indirectly the expression of the gene at cellular level. They act directly as ligands for transcription factor receptors. It is metabolized by metabolic pathways that cause changes in the concentrations of substrates and intermediate mediators in cell signalling and gene regulation. And also nutrients changes the signaling pathways and signaling. Active nutrition compounds in diet may change gene expressions related with the immune system. There is an engaging link between cell intrinsic and extrinsic metabolites and gene expression, with frequently observed experimental evidence of molecular mechanisms resulting in immune cells. The definition of “chrono-nutrition and chrono-immunology” enabled a new understanding about the effect of metabolism on immunity and the role of Warburg effect on immune cell functioning in recent years. The emerging field of metabolomics in human nutrition, as well as the development of valid FFQ and the continued expansion of food metabolome databases will permit the identification of specific dietary components in food, produce more valid biomarkers of exposure to certain foods and possibly advance nutritional science research which aims to evaluate