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Effects of Metabolic syndrome

Jhansi Rani G1, Srilatha D 2*

1Department of pharmacy, Padmavathi College of pharmacy, Dharamapuri, Tamil nadu, India

2Department of Biotechnology, Villa-marie College, Hyderabad, India

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*Correspondence:

Department of Biotechnology,
Villa-marie College, Hyderabad,
India

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ABSTRACT

Metabolic syndrome (MetS) is allied with abdominal obesity, blood lipid disorders, inflammation, insulin resistance, diabetes, and increased risk of developing cardiovascular disease (CVD) and also finally death [1,2,3]. The prevalence of this sorting affects nearly 1 in 3 adults in the United States. Due to the high frequency of this syndrome, proper documentation of persons with MetS is vital in order to prevent and/or alter the multiple predictor variables associated with CVD related disease and mortality as well as its high healthcare costs [5-9]. The lethal consequences are probably due to the smoking and excess weight induced chronic inflammatory development on the endothelial system for a long run. White coat hypertension (WCH) is a first sign of the accelerated systemic atherosclerotic process which can be easily detected and treated by preventing weight gain. Diabetes is the largest non-contagious disease, currently affected are more than 382 million people aged between 20-79 years across the globe and type 2 diabetes indisputably is the main underlying subtype [10,11]. Type two diabetes mellitus (T2DM) is the main leading factor to cardiovascular mortality worldwide. [12]. Nevertheless, both clinical conditions T2DM and MetS are considered as high risk factors that are responsible for cardiovascular outcomes through collaboration of similar pathogenesis' mechanisms [13]. Common to these diseases of metabolism is the associated development of Atherosclerotic Cardiovascular Disease (ASCVD). Studies have shown a strong link between CMS and increased prevalence of peripheral vascular diseases, corona artery disease and myocardial infarctions as well as cerebro-vascular arterial diseases and stroke [9]. It consists of atherogenic dyslipidemia elevations of blood pressure (BP) and glucose, and prothrombotic and proinflammatory states [14-16]. Metalic syndrome is considered as Obesity faced by many people. The constellation of Excess of lipids especially cholesterol, elevated blood pressure, impaired glucose tolerance, and central obesity is now classified as metabolic syndrome, also called syndrome X [16-18].

INTRODUCTION

With the beginning of the MS as a recognized body, it is now realized that all these separate risk factors are mostly part of the same overall problem. The most important effective disease due to MS is coronary vascular disease. This puts transplant patients who have the MS at increased risk in two ways: 1) it is adding as one more risk factor to the patient to be considered in the pre-removal workup, along with any other risk factors; and 2) the combined risk of cardiovascular disease post-transplantation as a side effect of not responding to immunity provided by medication together with the risk from cardiovascular disease developing from the MS might put a post-transplantation patient at massively increased risk for a cardiovascular event [19-25]. Diabetes is triggered by the deficient secretion of insulin .by the pancreatic β -cell (T1D) or the resistance of peripheral tissues to the action of this hormone

(T2D) . Chronic elevation of blood glucose levels is the major consequence of insulin deficiency or resistance, and also the main cause of long-term diabetic problems [25-27].

Reason for Obesity

Obesity is characterized by increased adipocyte tissue number and its hypertrophy with subsequent increase in adipose (fat) tissue formation. The increase in adipose tissue, contributes to obesity [28].

Many people are addicted to different things including harmful substances like heroine, morphine; internet; smoking and drinking, among others. Glucose addiction among diabetic patients has not been described in literature. But can be considered as an addiction [29].

TREATMENTS

Glycemic Index (GI) is the measure of increase in blood glucose level after intake of food rich in carbohydrate concerned to glucose. It measures the rate at which the carbohydrate in certain food is digested and absorbed into blood stream as glucose, i.e. GI of food represents its blood-glucose raising potential [1]. It ranks carbohydrate according to their effects on blood glucose levels [30-33].

Apolipoprotein E (apoE) is a multifunctional apolipoprotein that is manufactured by a number of tissues and cell types, including liver, adipose tissue and macrophages ApoE is a constituent of all major lipoprotein classes in plasma. ApoE is analytically involved in lipid homeostasis by easing receptor-mediated uptake of apolipoprotein B (apoB)-containing lipoproteins. It is widely appreciated that apoE has anti-atherogenic properties, as evidenced by accelerated atherosclerosis development in apoE knock-out mice. Besides multiple effects on lipoprotein metabolism, apoE also exerts anti-oxidative and anti-inflammatory properties [34-36].

Despite the pivotal role of apoE in lipoprotein metabolism, and the importance of genetic variations in APOE on the development of cardiovascular disease (CVD) remarkably little is known about the association of plasma apoE levels with incident cardiovascular disease [37].

Highly active antiretroviral therapy (HAART) has significantly improved the clinical outcome of HIV infection. However, HAART has been associated with theoretically severe side effects in HIV-infected adults as well as in children. HIV-1-infected patients on HAART often develops a metabolic syndrome - in particular lipodystrophy syndrome (LS), which is categorized by peripheral lipoatrophy and visceral fat redistribution and is associated with metabolic alterations including Excess of lipids especially cholesterol, insulin resistance and cardiovascular risk .The atherogenic profile of this syndrome, may increase the risk of cardiovascular disease (CVD) even in young HIV-infected patients [38-41].

Protease inhibitors (PI) and stavudine are frequently associated with abnormalities of the body composition. The present study aimed to evaluate the body fat composition of HIV-infected Congolese patients receiving antiretroviral other than PI or stavudine [41-43].

Neonatal diabetes mellitus (NDM) is a rare form of diabetes with an estimated prevalence of 1 in 100,000-300,000 live births [44]. Patients with NDM can be grouped into two well-defined subgroups, permanent and transient, each accounting for approximately 50% of patients. Approximately 20% of individuals with mutations in KCNJ11 have associated neurologic findings called the DEND syndrome [45-47].

Methods to control metabolic syndrome

The ketogenic diets (KDs) have been used for the treatment of medication-resistant epilepsy since the 1920s. The classical KD is a highly restrictive diet with a 3:1-4:1 ketogenic ratio, calculated as the weight of fat divided by that of carbohydrates plus protein [48-52]

Currently there are four different types of ketogenic diet: classic ketogenic diet, medium chain triglycerides (MCT) diet, Modified Atkins Diet (MAD) and Low Glycaemic Index Diet Treatment (LGIT) [16] Contrary to the classical KD, these diets can be provided without restriction of calories, protein and fluid

intake, and calculation of ketogenic ratio is not necessary. Figure 1 shows the distribution of major nutrients in calories in each diet [53-57]

Chronophysiology is an evolutionary multiscience that enables animals including humans to cope with the changing environment. Timing of food intake has been discovered to orchestrate postprandial circadian rhythms of nutrient ingestion, digestion, transport, and metabolism. As such, chrono-orchestration of food intake regulates appetite and eating rate.[58-62] Chrononutritional physiology is a major unnoticed sound science that, in light of realistic modeling and understanding of voluntary feed intake in food-producing ruminant models, offers practical perceptions towards establishing healthimproving feasible nutritional programs and regimens This is crucial considering that reliable hunger and nutrient intake predictions are indispensable to healthy and onchophobic provision of foods and nutrients to human cells. Such insightful knowledge can help formulate guidelines to prevent overnutrition and health issues namely overweight gain, obesity, and diabetes [63-69]

Complementary and alternative medicine (CAM) offers an opportunity for treatment by using nutraceutical food supplementation. The nutraceutical combination which is proposed here is constituted of Momomordica charantia (bitter melon or bitter gourd) extract, together with the antioxidants Astaxanthin and coenzyme Ubiquinone Q10, the anti-inflammatory proanthocyanidin in pine bark extract, vitamins B6, B9 and B12, the phyto-adaptogen Lepidium meyenii (Maca), and the amino acid L-acetyl carnitine [70-76]

Statistics

The World Health Organization projected that 300 million people will suffer from diabetes by 2025. Diabetes, the fourth leading cause of death has affected an estimated 246 million people in the world. Type 2 diabetes accounts for 90 to 95% of the incidence of diabetes and is associated with a strong genetic predisposition as well as age, obesity and lack of physical activity [77-83]

women of childbearing age (aged 20-44 years) was 24.5% in United States. Park et al. compared the prevalence of MS in the US and Korea among young adults aged 20 to 39 years and found large variations between the two countries, 21.6% vs. 6.9% and 23.0% vs. 6.9%, according to National Cholesterol Education Program- Adult Treatment Panel III and International Diabetes Federation criteria, respectively. [83,84]

A total of 366 million people worldwide—8.3% of the global population—has diabetes mellitus, and an additional 280 million persons have impaired glucose tolerance [85-89]

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