

Study effect of sulfur containing amino acid supplementation on oxidative stress, inflammatory markers and serum lipid in relation to obese subjects.

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Received: 22.09.19, Revised: 22.10.19, Accepted: 22.11.19

ABSTRACT

Obesity is a medical condition caused by an imbalance between energy intake and energy expenditure. Obesity is a state of low-grade chronic inflammation. Taurine is a sulfur-containing amino acid mainly obtained from diet, that is present in mammalian tissues in millimolar concentrations. Taurine has the main biological actions as potent antioxidant and anti-inflammatory, xenobiotic conjugate, regulate blood pressure, osmoregulation, cell membrane stabilizer. Some researchers found decreased levels of plasma taurine in obese subjects and the effects of taurine on the progression of obesity in animal models and humans and the anti-obesity agent. The present study was designed to investigate whether taurine supplementation suppress oxidative stress, inflammatory response and to modulate glucose homeostasis and improve lipid metabolism in obese subjects. A randomized double blind placebo-controlled study was carried out in Basrah governorate, southern Iraq. Fifty obese subjects (20 males and 30 females) with a mean age (37.86±4.39) were recruited from Basrah hospital in Basrah governorate from 20th November 2017 to 25th April 2018. Twenty five of those obese individuals received taurine supplementation as capsule (1gm 3 times daily), others twenty five obese subjects were matched by age and body mass index and randomly assigned to either the placebo (which was identical in appearance to taurine capsule) resistance starch 1gm 3 times daily. The study lasted 8 weeks. After blood samples were collected for laboratory measurement of biochemical parameters: Random blood glucose (RBS), HbA1c, lipid profile (serum total cholesterol (s.TC), serum triglyceride (s.TG), HDL-C, inflammatory marker (IL-1, IL-6, MDA, TNF-α). Both the placebo and taurine groups show significant reduction in weight and BMI (<0.0001) and significant reduction in lipid profile (↓s.TC, ↓s.TG, ↓HDL-c <0.0001), reduction in blood sugar RBS, HbA1c <0.001, significant reduction in inflammatory marker IL-6 <0.001, oxidative stress MDA <0.0001 with no difference between taurine and placebo regarding to IL-1, TNF-α. Taurine ameliorates obesity through stimulation of energy expenditure, modulation of lipid metabolism, down regulates the production of pro-inflammatory and anti-oxidative stress, regulate blood sugar.

INTRODUCTION

Obesity is a medical condition characterized by excess accumulation and storage of fat in body to the extent that it may have a negative effect on health [1]. Obesity is a complex multifactor disease that develops from the interaction between genetic and environmental factors associated with various chronic diseases particularly cardiovascular disease, diabetes mellitus, liver and other metabolic syndrome [2]. It is now shown that obese state is a chronic inflammatory condition characterized by macrophage infiltration and increased production of proinflammatory cytokines (IL-1, IL-6, TNF-α, CRP) [3,4]. Recently, it has been found that obesity associated with systemic inflammation and oxidative stress by activation of immune system [5]. Oxidative stress and reactive oxygen species produce in

human adipose tissue of obese by increased expression of NADPH oxidase and decreased expression of defense system (anti-oxidative enzymes) also increased both oxygen consumption and cell respiration rate and elevated levels of free fatty acid, dysregulated production of cytokine, all these factors may lead to hyperglycemia. Insulin resistance that related to obesity which may induce oxidative stress and inflammation. Inflammatory mediators activate enzyme complex that promote phosphorylation of serine residues and inhibit insulin signaling cascade [6,7]. Taurine (2-amino ethane sulfonic acid) is a β-amino acid that differs from other amino acid by giving a sulfonic acid group instead of a carboxylic acid group [8-10].