Editorial

Recent findings related to Nutrition and Diabetes Mellitus

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Roux-en-Y Gastric Bypass surgery is superior to medical treatment for short- to medium-term remission of Type 2 diabetes (T2DM) [1]. Recent research indicates that the improvements in insulin sensitivity following bariatric surgery are associated with elevated circulating bile acid concentration and remodeling of gut microbiota [2]. Gut microbiome can be considered as a target of dietary interventions or medicines to prevention/treatment of hyperglycemia in T2DM. Since, the glucose-lowering effects of metformin are mediated by changes in the composition and function of gut microbiota [3,4].

Branched Chain Amino Acids (BCAA) might not only elevate insulin resistance but also considered as useful biomarkers for early detection of IR; moreover, genes related to BCAA catabolism might serve as potential targets for the treatment of IR associated metabolic disorders [5]. Kevin et al. in 2016, claimed that dietary protein source is correlated with glucoregulatory markers and type 2 diabetes. For example, plant protein foods (with fibers and numerous phytochemicals) are beneficial, while processed meats (sodium, nitrates, and heme-iron) are unfavorable, but dairy foods with matrix rich in high quality proteins, calcium, magnesium, potassium, trans-palmitoleic fatty acids, low-glycemic-index sugars, and oligosaccharides have beneficial effects on aspects of glucose control, insulin secretion, insulin sensitivity, and/or T2DM risk [6]. With this regards, nuts favorably influence glucose homeostasis, weight control and vascular health through its unique nutrient composition and bioactive compounds such as: Unsaturated Fatty Acids, fiber, polyphenols, Arginine and magnesium [7]. Mediate-intake of Oat β-Glucan (OBG) for 3–8 weeks favored the glycemic control of T2DM patients but did not improve their insulin sensitivity [82]. Furthermore, compared with widely consumed common wheat (Triticum aestivum L.) spelt with bioactive compounds, fiber, phytochemicals (phytic acid and alkylresorcinols), and antioxidant compounds is beneficial for glycemic control, insulin sensitivity and hyperinsulinemia [9].

Regarding dietary patterns, vegetarian diet or Mediterranean diet with plant-based (whole grains, vegetables, fruits, legumes, nuts, fish, and olive oil) is inversely associated with diabetes risk; however, the duration of the adherence to these diets, and type of vegetarian needs further research [10,11]. Meta-analyses of prospective cohort studies and intervention studies using hydrogen carbonate and magnesium supplements suggest a probable positive effect of drinking water and mineral water on glycemic parameters especially those substituting diet beverages or caloric beverages with water, bicarbonate/magnesium-rich water [12].
A recent review highlights the potential protective effects of 4 non-provitamin A carotenoids (lutein, zeaxanthin, lycopene, and astaxanthin) in the development and progression of diabetic microvascular complications via scavenging reactive oxygen species, modulating gene expression, and reducing inflammation [13]. A meta-analysis on 14 eligible studies indicated that Co-Q10 supplementation slightly but significantly reduced fasting plasma glucose, but not fasting plasma insulin and HbA1C [14]. Costello et al. concluded that Cinnamon supplements added to standard hypoglycemic medications and other lifestyle therapies had modest effects on FPG and HbA1c via its bioactive ingredients; however, only 4 studies reached the ADA treatment goals of FPG <130 mg/dL/7.2 mmol/L or HbA1c <7.0% [15]. Moreover, he observed that chromium supplements have limited effectiveness, and there is little rationale to recommend their use for glycemic control in T2DM patients [16]. McNally et al. work highlighted the fact that obesity, type 2 diabetes and the metabolic syndrome are associated with a decrease in NO bioavailability; besides, dietary inorganic nitrate can be a beneficial agent with both anti-obesity and anti-diabetic effects, as well as improving vascular function [17].

References

