

Opinion

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Vitamin D Link to Diabetes and Obesity: Interesting Promising and Opposing Results to Be Followed Up



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Opinion

Vitamin D (1,25(OH)₂D₃), abbreviated also as 25(OH)D is a steroid hormone that has a range of physiological functions in skeletal and non-skeletal tissues and besides the effects on bone metabolism, vitamin D and calcium might contribute to metabolic disorder accompanied by obesity [1,2]. Possible mechanisms include that low vitamin D impairs insulin action, glucose metabolism and various other metabolic processes in adipose and lean tissue [3,4].

Polymorphisms of the vitamin D receptor, a member of the steroid/thyroid hormone receptor superfamily, gene were suggested to play a role in the pathogenesis of type 2 diabetes by influencing the secretory capacity of beta-cells. Further, genetic variants associated with low plasma 25(OH)D concentrations were shown to be associated with type 2 diabetes and to mediate modestly between obesity and increased risk of diabetes [4-6]. A potential independent role for vitamin D was suggested in the regulation of glucose metabolism in a setting of obese patients previously unknown to possess glucose metabolism abnormalities [7]. Similarly, a potential protective role of UVR-induced mediators, including vitamin D and nitric oxide as well as sun exposure in reducing the development of obesity and cardiometabolic dysfunction [8].

Further, low 25(OH)D was correlated with high body fat, glucose levels and decreased insulin sensitivity and considered a potential risk factor for obesity and development of insulin resistance leading to diabetes type 2 [9] and within a cross-sectional, nationally representative sample, abdominal obesity and insufficient 25(OH)D were shown to interact synergistically to influence the risk of insulin resistance [10]. However, while, higher values of total abdominal fat at the L2-L3 intervertebral level were associated with low 25(OH)D levels in Asian-Indian obese subjects without diabetes [11]; 25(OH)D levels were lower in prediabetic and diabetic than normoglycemic subjects and vitamin D deficiency was found to be associated more

with carbohydrate metabolism than with obesity [12], other researchers showed vitamin D levels to be neither related to obesity in diabetic as well non-diabetic Asian-Indian individuals nor to weight, fat mass or waist circumference in type 2 diabetic obese vitamin D deficient participants of Arab ethnicity after one year of vitamin D supplementation [13,14]. Ongoing research would inevitably elucidate the masked mechanisms and the reasons for infrequent difference in therapeutic responses.

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