

Vitamin D and Type 2 diabetes: From observation to intervention

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Abstract

Vitamin D deficiency has become a public health problem worldwide due to its increasing prevalence and potential health effects. Existing biologic and observational evidence strongly supports protective effects of vitamin D on type 2 diabetes. First, experimental studies have demonstrated that vitamin D is essential for pancreatic insulin secretion and peripheral insulin action through binding to the vitamin D receptor. Human studies, most from cross-sectional studies, have also shown that low dietary vitamin D intake or vitamin D levels were inversely related to glucose intolerance, insulin resistance, decreased insulin secretion, as well as prevalence of the metabolic syndrome. Furthermore, prospective data tended to support an inverse association between serum 25(OH) vitamin D levels and incident type 2 diabetes in a dose-response manner. Data from randomized clinical trials, albeit limited, suggest a protective effect of vitamin D treatment on insulin secretion and action in both non-diabetic and diabetic patients. However, these trials are limited by design due to small sample sizes, short intervention periods, insufficient vitamin D dose, and the lack of objective assessment of vitamin D status and insulin or glucose homeostasis. It remains unclear whether type 2 diabetes can be delayed or prevented by taking vitamin D supplements. Direct evidence from future clinical trials of higher dose vitamin D supplementation, such as the ongoing VITamin D and Omega-3 TriaL (VITAL), will clarify any beneficial effects of vitamin D on primary prevention of type 2 diabetes and thus will inform public health and clinical guidelines for diabetes prevention.

Biography

Yiqing Song has completed his ScD from Harvard School of Public Health and postdoctoral studies from Harvard Medical School. He is Assistant Professor at Harvard Medical School and an epidemiologist at Brigham and Women's Hospital with extensive experience in the evaluation of nutritional, biochemical, and genetic markers of type 2 diabetes in human cohort studies. He is the Principal Investigator of a NIDDK-funded grant studying the effects of vitamin D and omega-3 fatty acid supplementation in diabetes prevention in the VITamin D and Omega-3 TriaL (VITAL). He has published more than 80 papers in reputed journals and 8 book chapters.