VITAMIN D IN TYPE 2 DIABETES MELLITUS

Vitamina D no diabetes mellitus tipo 2

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Dear Editor,

Vitamin D is a very relevant substance at the nutritional level, since it regulates blood levels of calcium and phosphorus, participates in bone mineralization, and interferes with immunological processes. Currently, vitamin D has been suggested to improve glycemic control in patients with type 2 diabetes mellitus (T2DM).[1]

An investigation by Issa[2] conducted in Lebanon in 2017 analyzed the association between vitamin D and T2DM. Results show a possible inverse relationship between vitamin D levels and T2DM, as well as associated complications. Vitamin D replacement therapy is likely to decrease T2DM incidence and improve glycemic control, especially by increasing insulin secretion, decreasing insulin resistance, and decreasing inflammation. Although additional studies are required, vitamin D replacement therapy may be beneficial to prevent and improve some diabetic complications, especially nephropathy and cardiovascular diseases.

A review by Wu et al.[3] conducted in China in 2017 assessed the efficacy of vitamin D supplementation in reducing glycated hemoglobin A1c (HbA1c) and fasting blood glucose (FBG) levels. Results of some studies reviewed by Wu et al.[3] showed that vitamin D supplementation is associated with reduced HbA1c levels but had no influence on FBG levels. However, analysis from other studies suggested that vitamin D supplementation was associated with reduced HbA1c and FBG levels. It was possible to conclude that vitamin D supplementation could be effective in improving glycemic control in non-obese or vitamin D deficient patients with T2DM. Similar results were obtained in the review by Lee et al.[4] conducted in the United States in 2017.

A study by Upreti et al.[5] conducted in India in 2018 investigated the effect of oral vitamin D supplementation on glycemic control in patients with T2DM and hypovitaminosis D by conducting a randomized placebo-controlled trial with 60 patients. Case group showed significant decrease in mean HbA1c and FBG levels. Supplementation to achieve normal levels of vitamin D can be a promising adjuvant therapy for T2DM patients and coexisting hypovitaminosis D. It is worth noting that this study has some limitations, including sample size and statistical analyses, since paired and unpaired t-tests were used rather than covariance analysis.

An analysis by Harrison and Sisley[6] conducted in the United States in 2018 revealed that vitamin D deficiency is related to T2DM and showed that this may be due to the action of vitamin D in the paraventricular nuclei in the hypothalamus of the brain.

A clinical trial by Safarpour et al.[7] conducted in Iran in 2018 assessed the effect of vitamin D supplementation on glucose and lipid profiles, blood pressure, and biomarkers of liver and kidney in patients with T2DM. A double-blind randomized clinical trial was conducted with 90 patients with T2DM and serum 25-hydroxy vitamin D levels of less than 30 ng/ml. e

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subjects took 50000 IU vitamin D supplements or placebo for 8 weeks. Additionally, vitamin D supplementation significantly increased serum vitamin D level, superoxide dismutase (SOD) activity, and significantly decreased serum HbA1C level. Results showed that weekly supplementation with 50000 IU vitamin D for 8 weeks may be effective by improving HbA1C and lipid profile in T2DM.

An investigation by Aljack et al.[8] conducted in Sudan in 2019 evaluated serum vitamin D level in T2DM patients and its association with diabetic nephropathy and cardiovascular diseases (CVDs). A total of 205 patients with T2DM from 39 to 75 years of age were recruited. Serum vitamin D, high-sensitivity C-reactive protein, and HbA1c were measured In addition, urinary albumin:creatinine ratio was estimated. Results showed that T2DM patients with vitamin D deficiency are at higher risk for developing CVD and nephropathy.

In a study by Pittas et al.[9] conducted in 2019, 2,423 participants were randomly assigned as follows: 1,.211 to the vitamin D group and 1,212 to placebo group). By month 24, the mean serum 25-hydroxyvitamin D level in the vitamin D group was 54.3 ng per milliliter (from 27.7 ng per milliliter at baseline), as compared with 28.8 ng per milliliter in the placebo group (from 28.2 ng per milliliter at baseline). After a median follow-up of 2.5 years, the primary outcome of diabetes occurred in 293 participants in the vitamin D group and 323 in the placebo group. Results showed that, among persons at high risk for T2DM not selected for vitamin D insufficiency, vitamin D3 supplementation at a dose of 4000 IU per day did not result in a significantly lower risk of diabetes than placebo.

A critical analysis of the results of the scientific studies conducted in different countries in recent years showed that vitamin D is a promising therapy to improve glycemic parameters and comorbidities in T2DM patients. Of note, there was a difference in efficacy of interventions aimed at preventing the development of T2DM and those aimed at treating this condition in individuals with no reported vitamin D deficiency (less plausible). Additionally, it is worth emphasizing that supplementation does not seem to be useful for all individuals at high risk of T2DM. However, further studies should be conducted in this field to address current limitations, such as lack of information on adequate dose, number of weekly doses, treatment duration, increased consumption of foods with high vitamin D content, and nutritional guidelines, as well as to specify the efficacy and safety of supplementation. This is essential in order to provide T2DM patients with the best care possible, based on the latest available health evidence.

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CONFLICT OF INTERESTS

There is no relevant conflict of interests.

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