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# ANTIOXIDANT EFFECTS OF VITAMINS SUPPLEMENTATION IN TYPE 2 DIABETES: A SYSTEMATIC REVIEW WITH META-ANALYSES OF RANDOMIZED CONTROLLED TRIALS

María Eugenia Balbi[1]*, Fernanda S. Tonin[2], Antonio E. M. Mendes[2], Helena H. Borba[1], Astrid Wiens[3], Fernando Fernandez-Llimos[4], Roberto Pontarolo[3].

*[1]Departamento de Farmácia, Universidade Federal do Paraná, PR, Brasil.2 Pós graduanda do Programa de Pós-graduação em Ciências Farmacêuticas, Universidade Federal do Paraná, PR, Brasil. [3]Programa de Pós-graduação em Ciências Farmacêuticas, Universidade Federal do Paraná, PR, Brasil. [4] Institute for Medicines (iMed.ULisboa), Department of Social Pharmacy, Faculty of Pharmacy, Universidade de Lisboa, Lisbon, Portugal *bromatologia.ufpr@gmail.com.*

## INTRODUCTION

Current evidence shows that oxidative stress plays an important role in the pathogenesis of diabetes mellitus type 2 (T2DM), and may diminish the antioxidative defense system. Several studies have shown that individuals with low concentration of antioxidants are at increased risk of diabetes complications and that T2DM is straightly associated with endothelial dysfunction. These conditions may develop macro and microvascular diseases which are the main causes of morbidity and mortality worldwide.

## MATERIAL AND METHODS

We performed a systematic review with meta-analysis. Electronic searches were conducted in PubMed, Scopus, Web of Science. Randomized controlled trials evaluating any vitamin or vitamin complex supplementation on antioxidant status as primary outcome (malodialdehyde – MDA; glutathione peroxidase – GPx; total antioxidant capacity – TAC, superoxide dismutase enzyme – SOD, and thiobarbituric acid reactive substances – TBARS) were included. Other outcomes of glycemic control were also evaluated. Pairwise meta-analyses were performed comparing vitamins against placebo.

## RESULTS

Thirty trials fulfilled the inclusion criteria of the systematic review, but only 12 were able to be included in the meta-analyses of antioxidant outcomes. The main reported vitamins were B, C, D and E. Vitamin E was related to significantly reduction of blood glucose as well glycated hemoglobin, while both vitamins C and E were mainly referred in reducing MDA and TBARS and elevating GPx, SOD and TAC. However, outcome report in this field is still inconsistent (e.g. lack of standard measures).

## CONCLUSIONS

The supplementation of vitamin E can be a valuable strategy for controlling diabetes complications and enhancing antioxidant capacity. The effects of other micronutrients should be further investigated in larger and well-designed trials to properly place these complementary therapies in clinical practice.

## REFERENCES

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