

Usefulness of Magnesium Supplementation in the Control of Metabolic Glucose Disorders

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Editorial

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Editorial

Magnesium participates as essential cofactor in the vast majority of the enzymatic process related with energetic metabolism [1,2] furthermore, emerging clinical evidences show that magnesium deficiency is associated with the triggering of low-grade chronic inflammatory syndrome [3] which is implicated with the increase of insulin resistance [4]. Furthermore, recently, we show that magnesium supplementation improves the insulin secretion to compensate the decrease of peripheral insulin action [5].

Given that blockage of phosphorylation pathways and the low-grade chronic inflammation are related with decrease of insulin action, it is rationale to assume that magnesium deficiency is related with the pathogenesis of metabolic glucose disorders.

With this regard, although evidence from epidemiological studies consistently show that dietary magnesium intake is inversely associated with insulin-mediated glucose uptake, insulin sensitivity, and markers of chronic inflammation, results from randomized double blind controlled clinical trials regarding the efficacy of magnesium supplementation to decrease serum glucose levels are scarce and inconsistent [6].

In the search for answers to explain this paradox, recently we conducted a systematic review and meta-analysis of randomized controlled trials in order to evaluate the effect of oral magnesium supplementation on insulin sensitivity and glucose control of individuals with

type 2 diabetes and prediabetes [7]. Results of this analysis that included 1362 individuals enrolled in 21 clinical trials showed that magnesium supplementation, during a period equal or greater than four months, significantly improves the insulin action (as an indirect measurement using HOMA-IR index) and fasting glucose in both diabetic and non-diabetic subjects.

In addition, our analysis showed that effect of magnesium supplements, on fasting glucose and HOMA-IR, is significantly related with hypomagnesemia; finding that supports the statement that efficacy of magnesium supplementation, on the glucose metabolic disorders, depends of baseline magnesium status [8].

Furthermore, is necessary to keep in mind that, consistently, the randomized clinical trials using magnesium supplements show that adverse events or side effects due to magnesium salts are infrequent and characterized by slight abdominal pain and mild diarrhea that not require treatment or discontinuation of magnesium administration [9].

Regarding the serum magnesium levels, as biomarker of hypomagnesemia, should be taken into account that magnesium is a predominantly intracellular cation; thus, the serum magnesium level could not be the best indicator of magnesium deficiency. However, currently, there is not a reliable biomarker of hypomagnesemia available for clinical setting. Further research is mandatory and welcome in this matter.

As conclusion, current evidence strongly supports the use of magnesium supplements as adjuvants in the treatment of type 2 diabetes and among measures focused to decrease incidence of type 2 diabetes, seems to be highly recommended.

In order to reach the best results, magnesium supplements should be used in those individuals with metabolic glucose disorders, who exhibit serum magnesium levels equal or lower than 1.8 mg/dL (0.74 mmol/L), and during a minimum of four months.

Finally, is necessary to highlight that, irrespective of magnesium salt used, its dose should be the appropriate to reach a total of 380 to 450 mg of elemental magnesium per day, the current recommended daily dose of Mg²⁺ [10].

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