**The Absorption of Magnesium Oxide Compared to Citrate in Healthy Subjects**

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Background: Magnesium content in food is steadily decreasing in the Western world. Hypomagnesemia is associated with increased incidence of diabetes mellitus, metabolic syndrome, all-cause and coronary artery disease mortality. Two common oral magnesium supplements are magnesium oxide and citrate; however, data regarding the differences in their absorption in humans are sparse.

Methods: In a randomized, prospective, double-blind, crossover study, 41 (20 women) healthy volunteers [mean age 53±8 (range 31-75) years] received either magnesium oxide monohydrate tablets (520 mg/day of elemental magnesium) or magnesium citrate tablets (295.8 mg/day of elemental magnesium) for 1 month (phase 1), followed by a 4-week wash-out period, and then crossover treatment for 1 month (phase 2). Intracellular magnesium concentrations ($[Mg^{2+}]i$) were assessed from sublingual cells through x-ray dispersion (normal values 37.9±4.0 mEq/L), serum magnesium levels, platelet aggregation, and quality-of-life questionnaires were assessed before and after each phase.

Results: Oral magnesium oxide, rather than magnesium citrate, significantly increased $[Mg^{2+}]i$ (34.4±3 vs 36.3±2 mEq/L, $p<0.001$ and 34.7±2 vs 35.4±2 mEq/L, $p=0.097$; respectively), reduced total cholesterol (201±37 vs 186±27 mg/dL, $p=0.016$ and 187±28 vs 187±25 mg/dL, $p=0.978$; respectively) and low-density lipoprotein (LDL) cholesterol (128±22 vs 120±25 mg/dL, $p=0.042$ and 120±23 vs 121±22 mg/dL, $p=0.622$; respectively). However, both treatments significantly reduced epinephrine-induced platelet aggregation (78.9±16% vs 71.7±23%, $p=0.013$ and 81.3±15% vs 73.3±23%, $p=0.036$; respectively).

Conclusions: Oral magnesium oxide treatment significantly improved $[Mg^{2+}]i$, total and LDL cholesterol compared with magnesium citrate, although both treatments similarly inhibited platelet aggregation in healthy subjects with no apparent heart disease.