
Abstract

BACKGROUND:
Given that role of magnesium in insulin secretion is uncertain, our objective was to determine whether oral supplementation with magnesium chloride (MgCl(2)) improves the ability of beta-cells to compensate for variations in insulin sensitivity in non-diabetic individuals with significant hypomagnesaemia.

MATERIALS AND METHODS:
Eligible individuals were non-diabetic, normo-tensive men and non-diabetic, normo-tensive, non-pregnant women with serum magnesium levels ≤0.70 mM/L; they were enrolled in a randomized double-blind clinical trial to receive either 50 mL of 5% MgCl(2) solution or 50 mL of inactive solution daily for 3 months. The primary trial end point was a change in the AUC of the hyperbolic model of beta-cell function (HMbCF) derived from the fasting state. Individuals, caregivers and personnel who assessed the outcomes were all blinded to the group assignments.

RESULTS:
A total of 54 and 52 individuals were assigned to the MgCl(2) and placebo groups, respectively; five individuals in the MgCl(2) group and four in the placebo group dropped out. There were no serious adverse events or side effects because of MgCl(2) or placebo. At the beginning of the study, the AUC of the HMbCF was similar in both groups (AUC = 7.591 and 7.895 cm(2)); at the end of follow-up, the curve of the MgCl(2) group showed a hyperbolic distribution (AUC = 18.855 cm(2)), whereas in the placebo group, there were no changes (AUC = 7.631 cm(2)).

CONCLUSIONS:
MgCl(2) 2.5 g daily improves the ability of beta-cells to compensate for variations in insulin sensitivity in non-diabetic individuals with significant hypomagnesaemia.