

# Abstract

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## Low serum magnesium levels and foot ulcers in subjects with type 2 diabetes.

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**BACKGROUND:** Hypomagnesemia is associated with the development of neuropathy and abnormal platelet activity, both of which are risk factors for the progression of ulcers of the feet. Thus, the aim of this study was to determine the relationship between low serum magnesium and foot ulcer in subjects with type 2 diabetes.

**METHODS:** Thirty-three out-patients with type 2 diabetes and foot ulcers (16 women and 17 men) were compared with a control group of 66 out-patients with type 2 diabetes without foot ulcers (35 women and 31 men), matched by age, diabetes duration, HbA1c, and glycemia. Patients with foot ulcers were included in the study only if a foot ulceration onset not exceeding 2 months was established. Patients diagnosed with reduced renal function, a history of alcohol intake, or as having received magnesium supplementation or diuretics were not included. Serum magnesium was measured by colorimetric method. The relationship between serum magnesium and foot ulcers was assessed by logistic regression.

**RESULTS:** Hypomagnesemia was identified in 31 (93.9%) subjects with foot ulcers, and 49 (73.1%) control subjects,  $p = 0.02$ . Subjects with foot ulceration had lower serum magnesium levels ( $1.48 \pm 0.33$ ) than those in the control group ( $1.68 \pm 0.32$ ),  $p < 0.001$ . Logistic regression analysis showed a significant relationship between low serum magnesium levels and foot ulcers (odds ratio [OR] 2.9, CI 95% 1.7-6.8;  $p = 0.01$ ).

**CONCLUSIONS:** Serum magnesium depletion is present and shows a strong relationship with foot ulcers in subjects with type 2 diabetes and foot ulcers, a relationship not previously reported.

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