Letters to the editor

Hypomagnesaemia and Type 2 (non-insulin-dependent) diabetes mellitus

Dear Sir,

The recent publication by Schnack et al. [1] has once again drawn attention to the importance of magnesium homeostasis in patients with diabetes mellitus. In connection with this, we would like to comment on the interpretation of plasma magnesium values.

Although reduced mean plasma magnesium has been reported by some investigators in diabetic patients compared to non-diabetic subjects [1, 2], others could not corroborate this finding [3, 4]. A geographical influence and possibly, dietary factors may be involved. The mean values that have been found are well within the normal range of plasma magnesium and the clinical relevance of a reduction is unknown. Percentages of patients with true hypomagnesaemia (mean $\pm$ 2 SD) are not mentioned by Schnack et al. [1]. In a survey of 53 Type 2 (non-insulin-dependent) diabetic patients seen at our out-patient clinic, mean plasma magnesium was indeed significantly lower compared to 72 non-diabetic subjects: 0.85 ± 0.14 (SD) mmol/l vs 0.92 ± 0.14 mmol/l, $p < 0.01$, but only 3.8% of the diabetic patients and 1.4% of the non-diabetic patients were actually hypomagnesaemic (plasma magnesium less than 0.70 mmol/l in our laboratory) ($p = 0.39$, Fig. 1). None of the subjects had a plasma magnesium of less than 0.60 mmol/l and all of these patients had a plasma creatinine within normal limits. No associations were found between plasma magnesium and plasma glucose, or HbA_{1c}.

We are therefore of the opinion that true hypomagnesaemia is as rare in stable Type 2 diabetic patients as in non-diabetic subjects.

Yours sincerely,

H. W. de Valk, J. R. E. Haalboom and A. Struyvenberg

Fig. 1. Plasma magnesium in Type 2 (non-insulin-dependent) diabetic patients (■) and non-diabetic control subjects (▨) measured in mmol/l

References

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Dr. H. W. de Valk
Department of Internal Medicine
F02.126
University Hospital Utrecht
Heidelberglaan 100
NL-3584 CX Utrecht
The Netherlands

Response from the authors

Dear Sir,

In response to the comments by de Valk et al., we agree that the relevance of the reduction of serum magnesium levels in diabetic patients is not precisely defined and that further studies are mandatory to reveal the clinical importance of this phenomenon.

However, hypomagnesaemia is important in connection with cardiovascular complications [1, 2] and seems to be associated with the insulin resistant state [3–5]. Therefore, the clinical importance of hypomagnesaemia in diabetic patients might have been underestimated in recent years. Very recent data indicate, that hypomagnesaemia may be linked to the development of diabetic complications via reduction in the rate of inositol transport and subsequent intracellular inositol depletion [6].

The interpretation of serum magnesium levels within the normal range of clinical laboratories is difficult, since individuals with insulin resistance (e.g. hypertension, obesity) might have been included as healthy control subjects. Therefore, especially the lower limit of the normal range should be considered with caution and possibly a new evaluation of the normal range of serum magnesium is necessary.

Nevertheless, in contrast to the observations by de Valk et al., in our study [7] hypomagnesaemia (plasma magnesium levels < 0.7 mmol/l in our laboratory) was detected in eight diabetic patients (16%) compared to none of the control subjects ($p < 0.0001$). The lowest magnesium concentration observed in diabetic patients

was 0.53 mmol/l, the lowest magnesium level found in non-diabetic control subjects was 0.74 mmol/l. Twelve diabetic patients (24%) had magnesium levels lower than the mean value -2 SD of our healthy control subjects.

In conclusion our findings suggest that serum magnesium levels of Type 2 diabetic patients are significantly reduced and that "true" hypomagnesaemia is not as rare as in non-diabetic subjects.

Yours sincerely,

Ch. Schnack and G. Schernthaner

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Dr. Ch. Schnack
Department of Medicine I
Rudolfstiftung Hospital
Juchgasse 25
A-1030 Vienna
Austria