Hypomagnesemia in Alcoholic Patients

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A CUTE AND chronic alcoholism are the most common settings for hypomagnesemia in everyday clinical practice. In almost all studies addressing this issue, the total serum magnesium concentration was measured, although there are limitations on its use in evaluating total body magnesium stores. Recently, commercially available instruments with new ion-selective electrodes for ionized magnesium, the biologically active form of magnesium, have made its measurement possible. However, as has been pointed out, the determination of ionized magnesium activity in biological fluids is influenced by several factors, and the values found for it may differ when measured with different instruments. In particular, the usefulness of ionized magnesium determination is problematic in alcoholics, in whom significant differences in ionized magnesium have been found when two different instruments were used.

We are deeply involved in the study of the acid-base and electrolyte abnormalities observed in chronic alcoholic patients, and we have extensively studied the pathogenetic mechanisms of hypomagnesemia in alcoholic patients admitted to our university hospital for causes related to alcohol abuse. The mean (SD) total serum magnesium level was 0.7 ± 0.2 mmol/L, which was significantly lower than that observed in 203 normal controls (0.9 ± 0.3 mmol/L, \( p < 0.01 \)). These values are in agreement with the results reported by De Marchi et al. in a smaller group of patients with chronic alcoholism. Of interest, hypomagnesemia (total serum magnesium < 0.65 mmol/L) was the most common electrolyte disturbance observed in 38 of the 127 patients (29.9%), a value comparable to that reported by De Marchi et al. but a lot higher than the values obtained by Hristova et al.

The determination of total serum magnesium, the most common method clinically available to assess the magnesium status of patients, reflects only a small part of the total body content of this ion. Because 25% to 30% of serum magnesium is bound to albumin and is therefore inactive, measuring total serum magnesium may provide a spuriously low value in hypoalbuminemic states. Because a considerable number of malnourished alcoholics have low serum albumin levels, to overcome this problem we have used the Kroll proposed formula to correct serum magnesium for hypoalbuminemia: Corrected serum magnesium (mmol/L) = measured total serum magnesium (mmol/L) + 0.005 (40 − albumin g/L).

In our study, 16 patients (12.5%) had coexisting hypomagnesemia (serum albumin < 40 g/L); whereas the mean (SD) serum albumin concentration was 41 ± 6 g/L. Thus, the mean value of the corrected serum magnesium was 0.73 mmol/L, which, statistically, was not significantly different from the uncorrected value (\( p = 0.07 \)), but only two of the 38 hypomagnesemic patients now had values within the normal limits (0.66 and 0.67 mmol/L, respectively). Thus, in view of the significant problems encountered in the determination of ionized magnesium, we suggest that in evaluating the magnesium status in clinical practice, the total serum magnesium should be measured after correction for coexistent hypoalbuminemia.

REFERENCES