

Hypermagnesemia: Elderly Over-the-counter Drug Users at Risk

The article by Fung et al¹ published in the August 1995 issue of the ARCHIVES probably created public panic unnecessarily. The 69-year-old woman with hypermagnesemia most likely had abnormal renal function when she consumed the bottles of magnesium-containing antacids. From the case report, the estimated creatinine clearance,² calculated from age, sex, and serum creatinine levels, was 0.47 mL/s (28.3 mL/min) (normal range, 0.76-1.19 mL/s [45.7-71.4 mL/min]), suggesting that this patient did indeed have impaired renal function. A patient with normal kidney function secretes magnesium rapidly through the kidneys. In a normal state, the kidney filters approximately 2.5 g of magnesium and reclaims 95%, excreting some 100 mg/d in the urine to maintain homeostasis. Approximately 25% to 30% is reclaimed in the proximal tube through a passive transport system that depends on sodium reabsorption and tubular fluid flow. Usually, as serum magnesium concentration increases, there is a linear increase in urinary magnesium excretion, paralleling that of insulin.³ With normal kidney function, hypermagnesemia or magnesium intoxication usually does not develop,⁴ even during high intravenous magnesium infusion.^{5,6} In the ISIS-4 study,⁶ about 20 000 patients received 17 g/d of intravenous magnesium without intoxication.

Age per se is not a risk factor for development of hypermagnesemia as written in the article by Fung et al. The magnesium intake of the elderly tends to be low, and their susceptibility to magnesium deficiency is intensified by diminished intestinal absorption and increased urinary output of magnesium.^{7,8} Elderly persons, who are subject to disorders that impair absorption and renal function, and who may be taking magnesium-wasting medications, are likely to be particularly vulnerable to magnesium deficiency.⁹ Without renal function parameters and magnesium levels, it is unfair to compare other case reports as the authors did in their Table 2.¹ From this table, it is impossible to blame magnesium by itself as the cause of patients' signs and symptoms.

Unfortunately, the name of the article is misleading and might adversely affect the treatment of the elderly population and those who need magnesium supplementation. This case report describes the occurrence of magnesium intoxication due to impaired renal function and magnesium overdose, and not a normal phenomenon seen with magnesium supplementation. Therefore, a better title of the article might have been: "Elderly Patients With Impaired Renal Function and Anticholinergic/Narcotic Medications Should Be Aware

of the Possibility of Magnesium Intoxication by an Overdose of Magnesium-Containing Antacids."

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On behalf of Blaine Company, Inc, I would like to respond to the article, "Hypermagnesemia: Elderly Over-the-counter Drug Users at Risk" by Fung et al¹ in the ARCHIVES.

The authors used the work of Whang and Ryder² in an incomplete and misleading way. Whang and Ryder reported, "Serum magnesium abnormalities were identified in 546 of the 1033 specimens (hypomagnesemia [<0.74 mmol/L], 487; hypermagnesemia [>0.99 mmol/L], 59."

Fung et al fail to include the data in parentheses, which state that 89% of the 546 "abnormal levels" are hypomagnesemic and only 11% are hypermagnesemic. I think that deleting data from a report to support one's point of view is inappropriate to say the least.

Fung et al report on a patient who consumed bottles of antacid (who had been admitted and discharged the previous month for the same condition): "in her second comatose day . . . a routine laboratory screen that had been ordered earlier in the day by a medical resident revealed a serum magnesium level of 6.65 mmol/L (16.2 mg/dL). . . ."

According to Webster's *College Dictionary*, routine is "customary, regular, habitual." The magnesium screen was not routine or it would have been ordered immedi-