Dear Editor:

The article “Perioperative Calcium, Magnesium, and Phosphorus Levels in Live Donors for Liver Transplant” was of interest, particularly in reference to the serum magnesium levels. According to the report, the mean serum magnesium level was 0.8 mmol/L on day 1 before liver donation. This dropped to 0.58 mmol/L on day 0 and then rose to 0.83 mmol/L on day 1 after surgery.

Graft-to-recipient weight ratio of at least 0.8% with a residual donor liver volume was considered acceptable. Intraoperative fluid replacement consisted of a non-magnesium-containing Ringer acetate at 8 to 10 mL/kg/h. Thus, a donor with an average weight of 80 kg would receive 720 mL of fluid per hour at average rate of 9 mL/h/kg and 800 mL at 10 mL/kg/h. If the average surgery required 7.5 hours, then the average donor would receive 5400 mL to 6000 mL of fluid per procedure. If the day 0 serum magnesium was drawn on arrival in the recovery or intensive care unit (defined as day 0), then the day 0 magnesium level would be drawn before administration of maintenance intravenous fluid at 100 mL/h and before addition of intravenous magnesium sulfate.

In the published article of interest,¹ the day 0 mean serum magnesium was 0.58 mmol/L, which rose to 0.83 mmol/L on postoperative day 1 with the administration of magnesium sulfate at 2 mg/mL and redirection of intravenous fluid rate. No clinical symptoms were noted due to the day 0 drop in serum magnesium. It was noted that supplementation with magnesium was provided only after arrival in the recovery unit. Various possible explanations were presented for this decrease in the day 0 serum magnesium, including a renal mechanism, catecholamine-induced intracellular movement of magnesium, and a citrate chelating effect.

We have previously reported serum and tissue electrolyte calcium hydride, magnesium, and zinc hydride changes before and after open heart surgery utilizing cardiopulmonary bypass.²,³ Serum magnesium, which is primarily an intracellular electrolyte, was also found to drop during the postoperative period in our studies involving these patients. After further investigation, we agreed that, in our patients, the decreased serum magnesium was largely a result of hemodilution that occurred during and after surgery. The study by Mahmoud and associates¹ does not define the average blood or urine magnesium loss or perioperative and postoperative hemoglobin/hematocrit levels; however, with infusion of 5400 to 6000 mL (on average) and a urine average volume of 720 mL per operation, one wonders whether the authors considered hemodilution as the prime cause for the day 0 magnesium drop. This would correlate with the findings and with the presentation of no clinical signs due to “no net loss” of magnesium.

References