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Letter to the Editor

Letter to the editor: Clinical impact of hypermagnesemia in acute kidney injury patients undergoing continuous kidney replacement therapy: A propensity score analysis utilizing real-world data.

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The recent article by Chan et al., entitled "Clinical impact of hypermagnesemia in acute kidney injury patients undergoing continuous kidney replacement therapy: A propensity score analysis utilizing real-world data," addresses an important clinical question regarding the impact of hypermagnesemia in critically ill patients undergoing continuous kidney replacement therapy (CKRT) [1]. However, their conclusions warrant further scrutiny in light of contrasting real-world data.

Notably, the authors did not reference several important studies reporting findings that contrast with their conclusions. For example, a study by Pérez-García et al. found that low serum magnesium (Mg) levels were significantly associated with increased mortality among hemodialysis patients, which contrasts with the work of Chan et al. that showed adverse outcomes associated with higher magnesium levels [2]. In their cohort of 137 patients (mean age of 67 years), Pérez-García et al. reported that serum Mg levels were significantly influenced by the type of dialysis fluid used. Patients with higher serum Mg ($>$ 2.1 mg/dL) exhibited significantly better survival rates ($p = 0.008$). These findings underscore the potential protective effect of higher serum Mg levels in this population.

Similarly, Gu et al. conducted a large retrospective cohort study using the MIMIC-IV database (Medical Information Mart for Intensive Care-IV), analyzing critically ill septic patients to assess the effect of magnesium sulfate administration on mortality [3]. After propensity score matching (PSM), their analysis revealed a significant reduction in 28-day all-cause mortality among patients who received magnesium sulfate (HR 0.70; 95 % CI, 0.61–0.79; $p < 0.001$), with consistent benefits across both hypo- and normomagnesemic patients. Additional analyses showed reductions in ICU mortality (OR 0.52), in-hospital mortality (OR 0.65), and need for renal replacement therapy (OR 0.67), further supporting a potential therapeutic role for magnesium sulfate in critical care.

These findings contrast starkly with the results reported by Chan et al., who observed an association between hypermagnesemia and poorer outcomes in patients with acute kidney injury undergoing continuous kidney replacement therapy. While Chan et al.'s study is robust in design, the omission of contrasting evidence—particularly from studies with similarly rigorous methodologies—limits the discussion's scope and may affect how the findings are interpreted and generalized.

In addition to observational data, growing interest in magnesium therapy in the intensive care unit (ICU) setting is reflected in recent interventional studies. A systematic review has indicated that magnesium sulfate may aid in restoring sinus rhythm in critically ill patients with new-onset atrial fibrillation. Furthermore, two randomized controlled trials have reported a lower risk of acute kidney injury following magnesium sulfate administration in the ICU setting [4,5].

In conclusion, while the literature continues to present conflicting findings regarding the impact of hypermagnesemia and magnesium supplementation, there is strong and growing evidence that hypomagnesemia is deleterious. It is associated with life-threatening complications such as malignant arrhythmias, coronary vasospasm, and sudden cardiac death, as well as increased mortality, mechanical ventilation requirements, and prolonged ICU stays in critically ill populations. Given the divergent findings across studies, prospective trials are essential to clarify magnesium's therapeutic role and guide clinical practice.

CRediT authorship contribution statement

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Declaration of competing interest

The authors declare to have no competing interests.

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