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Clinical significance of masked hypernatremia in acute kidney injury patients requiring CRRT: Multicenter retrospective study

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Objectives : Hypernatremia is more common in critically ill patients than in the general population and is associated with increased mortality and prolonged ICU stay and mechanical ventilation. In patients with hyperglycemia, elevated corrected sodium may be overlooked when relying only on measured sodium, which can lead to unrecognized hypernatremia and inappropriate sodium correction during continuous renal replacement therapy (CRRT). Evidence regarding masked hypernatremia in CRRT patients is limited. We aimed to investigate the association between masked hypernatremia and mortality.

Methods : Patients were classified into four groups based on measured and glucose-corrected sodium, excluding hyponatremia: (1) normonatremia (both 135–145 mmol/L); (2) masked hypernatremia (measured 135–145, corrected 145–155 mmol/L); (3) mild to moderate hypernatremia (measured 145–155 and corrected >145 mmol/L); and (4) severe hypernatremia (both >155 mmol/L). Kaplan–Meier curves and Cox regression were used to analyze 3-, 7-, and 28-day mortality.

Results : Of 891 patients, 634 (71.2%) had normonatremia, 65 (7.3%) masked hypernatremia, 170 (19.1%) mild to moderate hypernatremia, and 22 (2.5%) severe hypernatremia. SOFA and APACHE II scores were highest in the mild/moderate and severe hypernatremia groups, while the masked hypernatremia group had the highest mechanical ventilation rate and glucose level. Kaplan–Meier curves showed the lowest 28-day survival in the masked hypernatremia group. In Cox regression, masked hypernatremia was significantly associated with 3-day, 7-day, and 28-day mortality. Only masked hypernatremia showed significant associations with both 3- and 7-day mortality, while mild to moderate hypernatremia was associated with 28-day mortality.

Conclusions : In critically ill patients requiring CRRT, masked hypernatremia was significantly associated with mortality at 3, 7, and 28 days. However, no other hypernatremia group was associated with mortality at 3 or 7 days. This suggests that hypernatremia masked by hyperglycemia should not be overlooked, especially in the acute phase (less than 7 days), and highlights the importance of corrected sodium in patients initiating CRRT.