

Hyperchloraemia in sepsis: saline vs. balanced crystalloids



Chloride, as the major anion of the extracellular fluid, constitutes an important element in the homeostasis of the human organism. Hyperchloraemia, whether a result of the sepsis process or a consequence of its treatment with supraphysiologic chloride fluids, appears to have a negative impact on the clinical outcome of septic patients, according to an article published in *Annals of Intensive Care*.

Acidosis is a frequently identified acid-base disorder in patients with sepsis and is linked to different pathophysiological routes (type II respiratory failure, renal failure, lactic acidosis, ketoacidosis). Chloride, as the body's major anion, represents two-thirds of all negative charges in plasma and is also responsible for one-third of plasma tonicity. Its role and significance in acid-base balance, osmosis, muscular activity and immunomodulation has been overshadowed by other serum electrolytes, even though chloride abnormalities have been detected in 25 percent of patients under critical care.

"The detrimental effect of hyperchloraemic acidosis on the inflammatory response, on haemodynamics and also upon the homeostasis of organs or systems, demonstrated by studies in humans and some experimental models of sepsis, should keep clinicians alert," note the article authors. "Aggressive fluid resuscitation, with chloride-rich crystalloids, during the treatment of sepsis-induced hypoperfusion, may lead to iatrogenic hyperchloraemic acidosis."

The authors advise close monitoring of chloride levels and acid-base homeostasis at all levels of hospitalisation, starting with the early resuscitation treatment in the emergency room.

Balanced crystalloids appear to improve the sepsis outcome, when compared to saline, according to the authors. The SMART randomised trial, for instance, demonstrated a statistically significant higher 30-day in-hospital mortality in septic patients treated with saline compared to those treated with balanced crystalloids. The beneficial effect of balanced crystalloids is supported by the probable harmful effects of saline on mean arterial pressure (MAP), renal haemodynamics and the gastrointestinal tract, particularly in the setting of sepsis-induced systemic hypoperfusion and lastly the higher mortality rates of patients receiving saline.

Up to date, however, saline remains the fluid of choice in septic patients with comorbidities such as severe hyponatraemia, cerebral oedema and brain injury, the authors say.

"Large-scale randomised trials analysing more than one endpoint (mortality, haemodynamics, AKI, haemostatic disorders, other organ damage, length of ICU and hospital stay) are urgently needed in order to confirm the possible beneficial effect of chloride restriction strategies," the authors conclude.

Source: [Annals of Intensive Care](#)

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