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CORRESPONDENCE

Ceremonial purification: which rite is right in liver failure?

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Saliba et al. have provided a detailed and scoping review of the role of extra-corporeal liver support devices in patients with liver failure [1]. However, they do not discuss the role of continuous renal replacement therapy (CRRT) in ammonia clearance. Ammonia is an extremely important toxic metabolite in severe liver failure and contributes to the development of hepatic encephalopathy. Ammonia is also water-soluble and has low molecular mass, rendering it readily removed by conventional renal replacement techniques.

There is increasing evidence supporting the use of conventional renal replacement techniques for managing acute liver failure (ALF) [2]. We have recently published our experience with the use of high-volume CRRT in acute liver failure [3, 4]. In 62 patients with ALF admitted to the Intensive Care Unit, we found that ammonia clearance was related to CRRT dose (median 43 ml/kg/hr), and duration of CRRT (median 75 h (57–78)) [3, 4]; additionally, the use of CRRT significantly decreased the number of patients with life-threatening hyperammonaemia (defined as > 150 μmol/L) by approximately 75% in less than 48 h [4]. Furthermore, recent research suggests there is no significant difference in ammonia clearance between different CRRT techniques [5]. Thus, we argue that high-volume CRRT should be included in any discussion regarding the use of extra-corporeal devices in liver failure. Moreover, we believe that future studies of novel blood purification techniques in ALF should include high-volume CRRT as the comparator. Finally, we suggest that early intervention with CRRT targeted to ammonia levels (and not uraemia) is fundamental in ALF patients.

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Declarations

Conflicts of interest
The authors declare no conflict of interest.

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References

1. Saliba F, Bañares R, Larsen FS, Wilmer A, Parés A, Mitzner S et al (2022) Artificial liver support in patients with liver failure: a modified DELPHI consensus of international experts. Intensive Care Med 48(10):1352–1367
2. Naorungroj T, Yanase F, Eastwood GM, Baldwin I, Bellomo R (2021) Extracorporeal ammonia clearance for hyperammonemia in critically Ill patients: a scoping review. Blood Purif 50(4–5):453–461
3. Warrillow S, Fisher C, Tibballs H, Bailey M, McArthur C, Lawson-Smith P et al (2020) Continuous renal replacement therapy and its impact on hyperammonaemia in acute liver failure. Crit Care Resusc 22(2):158–165
4. Warrillow S, Fisher C, Bellomo R (2020) Correction and control of hyperammonemia in acute liver failure: the impact of continuous renal replacement timing, intensity, and duration. Crit Care Med 48(2):218–224
5. Fisher C, Baldwin I, Fealy N, Naorungroj T, Bellomo R (2022) Ammonia clearance with different continuous renal replacement therapy techniques in patients with liver failure. Blood Purif 51(10):840–846