Intensive Care Med (2016) 42:1838–1839
DOI 10.1007/s00134-016-4459-4

CORRESPONDENCE

Renal replacement therapy modalities in the ICU: the continuity is intermittent

Joerg C. Schefold*

Dear Editor,
We read with great interest the article "Continuous renal replacement therapy versus intermittent hemodialysis in intensive care patients: impact on mortality and renal recovery" [1] in which Dr. Truche and colleagues assess the impact of renal replacement therapy (RRT) modality on patient outcome. Following the inclusion of 1360 patients with the need for RRT into an observational study aiming to minimize bias using a marginal structural Cox model, the authors found no significant differences regarding 30-day or 6-month mortality between patients initially treated with continuous RRT (CRRT) versus intermittent hemodialysis (iHD). Moreover, patients with higher weight gain at RRT initiation seemed to benefit from CRRT, whereas CRRT was associated with adverse outcome in patients without hemodynamic insufficiency.

The debate on a potential "best" modality is long-existing and has triggered a number of previous larger prospective RCTs [2–4]. Although challenged by retrospective data [5], earlier RCT data [2–4] and current observational data [1] now seem to answer two important questions. First, mounting evidence demonstrates that CRRT and iHD should indeed be considered equivalent approaches in a general population of critically ill patients [1–4]. Nevertheless, it seems important to note that CRRT allows for a wide combination of diffusive and convective measures and the introduction of new techniques that require different machine settings (e.g., citrate anticoagulation) might have occurred during the observational interval. Thus, it would be interesting to understand which set-ups were used and what specific delivered RRT dose(s) were applied.

Second, the current data may underline that hemodynamic unstable patients must not be treated using CRRT per se. Instead, an individualized approach in regard to choosing RRT modality should apply and take, e.g., the degree of hemodynamic instability, individual metabolic status, and other co-morbidities (e.g. the presence of brain injury) into account. In experienced hands and in cases of adequate protocols being installed, performing of iHD might be equally appropriate in cases without severe hemodynamic instability. Nevertheless, when analyzing data on RRT modality, it must be noted that switching of RRT modality (typically occurring in response to "stepping-down" of treatment intensity) may significantly impact on respective data, and this might only be partially compensated for by using sophisticated statistical models. In the light of the complexity of the longitudinal course of critical illness, it may therefore remain unclear which patient benefits from what modality at which time. In addition, the current trial demonstrates that patients with higher weight gain might benefit from CRRT [1]. Nevertheless, although defining weight gain might be challenging in this complex longitudinal context, it appears that fluid overload should be taken into account in future studies.

In summary, the strategy of the future might most likely not be based on a single one-size-fits-all RRT modality, but should embrace all available RRTs in a complementary fashion. Besides continuous or intermittent modalities, combination approaches such as alternating daily IHD/ultrafiltration or sustained low-efficiency dialysis seem promising and might be useful in the future. In the light of the current excellent trial, this may become even more evident.

*Correspondence: joerg.schefold@insel.ch
Department of Intensive Care Medicine, Inselspital, Bern University Hospital, Freiburgstrasse 10, 3010 Bern, Switzerland

A response to these comments is available at doi:10.1007/s00134-016-4559-1.

Compliance with ethical standards

Conflicts of interest
The author has no conflict of interest to disclose.

Accepted: 19 July 2016
Published online: 30 September 2016-

References

1. Truche AS, Darmon M, Bailly S, Clec'h C, Dupuis C, Misset B et al (2016) Continuous renal replacement therapy versus intermittent hemodialysis in intensive care patients: impact on mortality and renal recovery. Intensive Care Med. doi:10.1007/s00134-016-4404-6 (erratum doi:10.1007/s00134-016-4418-0)
2. Lins RL, Elseviers MM, Van der Niepen P, Hoste E, Malbrain ML, Damas P et al (2009) Intermittent versus continuous renal replacement therapy for acute kidney injury patients admitted to the intensive care unit: results of a randomized clinical trial. Nephrol Dial Transpl 24(2):512–518
3. Schefold JC, von Haehling S, Pschowski R, Bender T, Berkmann C, Briegel S et al (2014) The effect of continuous versus intermittent renal replacement therapy on the outcome of critically ill patients with acute renal failure (CONVINT): a prospective randomized controlled trial. Crit Care 18(1):R11
4. Vinsonneau C, Camus C, Combes A, Costa de Beauregard MA, Klouche K, Boulain T et al (2006) Continuous venovenous haemodiafiltration versus intermittent haemodialysis for acute renal failure in patients with multiple-organ dysfunction syndrome: a multicentre randomised trial. Lancet 368(9533):379–385
5. Wald R, Shariff SZ, Adhikari NK, Bagshaw SM, Burns KE, Friedrich JO et al (2014) The association between renal replacement therapy modality and long-term outcomes among critically ill adults with acute kidney injury: a retrospective cohort study*. Crit Care Med 42(4):868–877