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Renal replacement therapy during surgery: an observational cohort feasibility study

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Position du problème et objectif(s) de l'étude:
Continuous renal replacement therapy (CRRT) is often indicated for the management of metabolic changes in critically ill patients who exhibit acute kidney injury. A growing number of studies address the effect of intraoperative renal replacement therapy (IoRRT) on patient outcomes in case of orthotopic liver transplantation and cardiac surgery. We aimed to assess the feasibility and safety of this method on surgical patients undergoing other types of surgery.

Matériel et méthodes:
Protocol was approved by our local review board. This retrospective cohort study included all adult (18 years and older) patients who underwent IoRRT during non cardiac non liver transplantation surgery between January 1, 2013, and January 31, 2021, at the Hospices Civils de Lyon, France. Patients were divided into 2 groups: emergency surgery and elective surgery. Outcomes of interest included feasibility and safety with complications related to the technique, kidney function at hospital discharge, as well as indication of IoRRT, hospital length of stay and patient survival.
Quantitative data are expressed as medians and interquartile ranges (IQR) and compared using the Wilcoxon rank sum test. Qualitative data are described using numbers and percentages and compared using the Fisher's exact test. Statistical tests were two tailed and $p < 0.05$ was considered significant. All analyses were performed with R v. 4.2.2.

Résultats & Discussion:
Forty-three patients were included. IoRRT was feasible with adequate human and material resources management. No IoRRT complication such as filter clotting or circuit interruption was observed. No citrate accumulation was reported. At hospital discharge amongst survivors, no patients entered terminal chronic kidney disease, 4 (29%) had a glomerular flow rate between 60 and 90 mL/min/1,73m² and 10 (71%) over 90 mL/min/1,73m². The main indication for IoRRT in the emergency group was severe acidosis (82%). In the elective surgery group, RRT was systematically initiated as prevention for high-risk surgeries. Overall, 29 patients died (67%). Among survivors, the median length of stay in the intensive care unit was 11.5 days.
This study highlights the feasibility of continuous IoRRT for managing metabolic disorders and AKI, particularly in critically ill patients with multi organ failure. The low incidence of complications allowed for the safe and effective use of RRT in this context.

Conclusion:
Intraoperative CRRT seems to be a feasible and safe adjunctive therapy during emergency or elective surgery with severe metabolic disorders. No complication linked to IoRRT was reported. Kidney function seemed to have been preserved. Further prospective studies with larger sample sizes are warranted toconfirm these findings and to identify prognostic factors that may help choosing whether or not to introduce RRT during these types of surgery.

Les auteurs déclarent avoir une relation financière impliquant l'auteur ou ses proches (salaires, honoraires, soutien financier éducationnel) et susceptible d'affecter l'impartialité de la présentation.: Thomas Rimmele : activité de consultant chez Fresenius