

This is a Fresenius Medical Care summary of:

## Regional citrate anticoagulation for high volume continuous venovenous hemodialysis in surgical patients with bleeding risk

*Kalb R et al. Ther Apher Dial 2013;17:202-212*

### Introduction

Supporting haemodynamic stability, continuous renal replacement therapy (CRRT) is a preferred treatment option in intensive care unit patients on vasopressor support who require renal support due to an acute kidney injury (AKI). However, CRRT usually requires anticoagulation.

Heparin – which is most commonly used for this purpose – is associated with increased bleeding risk especially in postoperative surgical patients.

An alternative anticoagulation to avoid systemic heparin administration is regional citrate anticoagulation (RCA) using the Ci-Ca<sup>®</sup> protocol.

### Objective

Efficacy and safety evaluation of RCA in surgical ICU patients with high risk of bleeding.

### Design

This is a single-centre, prospective, observational, uncontrolled study in 75 adult patients with severe AKI (RIFLE classification F/failure).

RCA was established using the Ci-Ca<sup>®</sup> protocol, including titration of citrate and calcium infusions based on 4 hourly post-filter ionised calcium concentration and arterial blood gas measurements.

### Results

- Filter patency was excellent, with half of the filters reaching the maximum specified in-use-time of 72 h. In filters discontinued for non-CRRT reasons and in the filters showing clotting,  $58 \pm 18$  h and  $62 \pm 19$  h were reached.
- Delivered dialysis dose matched prescribed dialysis dose, apparently reflecting long running times.
- Hypercalcaemia did not occur. Mild, asymptomatic hypocalcaemia did occur at low frequency (1.9%) and could in all cases be corrected by adjusting calcium substitution.
- Acidosis resolved in the majority of acidotic patients. Only mild alkalosis (pH up to 7.6) occurred in less than one third of the patients and was controlled by reduction of blood flow.
- No major clinically relevant adverse effects of RCA were observed.

The findings of this study modified practice in the study center: by restarting circuits on Friday, a stable CRRT becomes likely and workload on the ICU is reduced during weekends.

### Conclusion

The study comes to the conclusion that RCA using the Ci-Ca<sup>®</sup> protocol “can be recommended as a useful tool for renal replacement therapy in critically ill patients in ICU”.