During extracorporeal dialysis, some anticoagulation strategy is necessary to prevent the coagulation of blood" Ricci et al (2017).

Abstract:

During extracorporeal dialysis, some anticoagulation strategy is necessary to prevent the coagulation of blood. Heparin has historically been used as an anticoagulant because of its efficacy combined with low cost. However, a variable incidence of hemorrhagic complications (5-30%) has been documented in patients undergoing continuous renal replacement therapy (CRRT) with heparin as an anticoagulant. Citrate has anticoagulation properties secondary to its ability to chelate calcium, which is necessary for the coagulation cascade. Citrate may thus be used in a regional anticoagulation (RCA), limited to the extracorporeal circuit of CRRT, to avoid systemic anticoagulation.

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Recent meta-analysis confirmed the advantage of RCA over heparin in terms of incidence of bleeding during CRRT. Moreover, an increase in filter lifespan is documented, with a secondary advantage in reaching the prescribed dialysis dose. In our experience, we could confirm this positive effect. In fact, with a progressive increase in the proportion of CRRT with citrate as RCA, we obtained a reduction in the number of filters used for every 72 h of

treatment (from 2.4 in 2011 to 1.3 in 2015), and most importantly, a reduction in the difference between the prescribed and delivered dialysis doses (from 22 to 7%). Citrate has an intense effect on the acid-base balance as well, if fully metabolized through the Krebs cycle, due to the production of bicarbonate. Even more severely ill patients, such as those with liver dysfunction, may be treated with RCA without severe complications, because modern machines for CRRT are equipped with simple systems that are able to manage the citrate infusion and control the calcium levels, with minimal risks of metabolic derangements.

Reference:

Ricci, D., Panicali, L., Facchini, M.G. and Mancini, E. (2017) Citrate Anticoagulation during Continuous Renal Replacement Therapy. Contributions to Nephrology. May 23rd. .

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