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Effects of citrate dialysate in high-volume online hemodiafiltration using central delivery system

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Objectives: Recently, the adverse effects of acetate-based dialysate (AD) have increased interest in citrate-based dialysate (CD). However, there is not much research on whether CD is safe and effective even in high-volume hemodiafiltration (HDF), and especially in using central delivery system (CDS). The aim of this study was to investigate the efficacy and safety of CD in high-volume HDF using CDS.

Methods: In the present study, the efficacy and safety parameters of CD were analyzed in 28 patients who received OL-HDF using CDS from October 2018 to April 2019. For the first 12 weeks, each patient received OL-HDF with AD (AD period), followed by another 12-weeks period during which they received OL-HDF with CD (CD period). Dialysis parameters, laboratory parameters, and safety parameters between two periods were compared and analyzed.

Results: The total dialysis session was 3,061 times. The average convective volumes for AD and CD period were 24.1 ± 2.0 L/session and 24.0 ± 2.2 L/session, respectively (p=0.786). After the change from AD to CD, heparin dose was decreased by 17% (p<0.001), Kt/V was increased by 3.8% (p=0.026), and predialytic B_2-microglobulin level was decreased by 11.6% (p<0.001). Serum calcium level decreased in CD period, but there was no symptomatic hypocalcemia. PTH level was maintained within the target range (i-PTH<300 pg/mL) despite increasing. During study period, there were no adverse events including GI bleeding, cerebral hemorrhage, or sepsis. The occurrence of vascular access occlusion did not differ between the two period. (AD vs. CD, 5 vs. 4 cases).

Conclusions: For patients with high volume OL-HDF using CDS, the use of CD instead of AD may have benefits including reducing heparin dose and increasing dialysis efficiency without significant adverse effects.

Table 1. Dialysis parameters for online hemodiafilteration

	AD period	CD period	P
Heparin dose (unit/session)	4333.0±1208.0	3610.0±866.0	<0.001
Kt/V	1.920±0.357	1.993±0.393	0.026
Predialytic B_2-MG (mg/L)	26.8±5.4	23.7±4.9	<0.001
Ca (mg/dL)	9.0±0.6	8.5±0.7	<0.001
P (mg/dL)	5.0±0.9	5.6±1.0	<0.001
i-PTH (pg/mL)	226.6±167.8	290.6±96.6	0.004