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Stepwise achievement of high convection volume in post-dilution hemodiafiltration: a prospective observational study

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Objectives: High-volume online hemodiafiltration (HDF) has been reported to decrease the risk of all-cause and cardiovascular mortality. However, achieving a high convection volume in routine clinical practice is challenging. In this prospective study, we investigated the feasibility of achieving high-volume HDF with ≥21 L substitution fluid volume in clinical practice via modification of blood flow rate (BFR), needle size, and dialysis membrane.

Methods: In 30 patients undergoing hemodialysis, we followed a stepwise protocol and gradually increased the BFR (280→300→330 mL/min; steps 1, 2, and 3, respectively) and needle size (from 16 G to 15 G; step 4). Next, the dialyzer was changed from FX80 to REXEED25A, and the BFR and needle size were similarly increased stepwise (steps 5, 6, 7, and 8).

Results: The total number of dialysis sessions in the 30 patients was 716. The mean substitution volume was 18.7 ± 2.2 L at step 1 and it significantly increased to 25.1 ± 2.6 L by step 8. A substitution volume of 21 L was achieved by 13.3% of patients in step 1 and by 96.7% after step 8. The substitution volume was higher for the dialyzer with a large surface area and for the larger needle (15 G). Between steps 1 and 8, the Kt/V and β2-microglobulin reduction ratios also improved significantly.

Conclusions: High-volume HDF is feasible through a stepwise increase in the BFR, needle size, and surface area of the dialysis membrane.