

Why Convection Volume of Hemodiafiltration Matters?

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Despite major technical advances, better understanding of uremic toxicity and improvement in patient care due to best practices implementation, mortality of dialysis patients remains desperately high. The interest for middle and larger uremic compounds has resurfaced following recent clinical trials and outcome-based studies. On one side, increasing small molecule clearance (e.g., Kt/V urea, HEMO Study) has not been shown to improve patient survival. On the other side, increasing middle molecules removal with high flux dialyzer has been associated with positive effects on patient survival (e.g., HEMO Study and MPO study).

Following findings of DOPPS study (2006) associating convective dose and dialysis patient outcomes, four large prospective randomized controlled trials (RCTs) have been conducted in Europe to compare survival outcomes in prevalent patients receiving conventional hemodialysis with online postdilution post-dilution HDF (ol-HDF). Combined together, these RCT studies and individual patient data meta-analyses (IPD-MA) support the conclusion that convection volume matters on patient outcome in a dose relationship manner. High volume postdilution HDF (>23L/1.73m²/session) is associated with improved overall survival in all-cause (≈20%) and CV mortality (≈25%). Today, this threshold volume represents a new adequacy target for optimal HDF delivery. Interestingly, these findings have been corroborated with the same order of magnitude by three national large database studies including France, Australia-New Zealand and Japan reporting significant reduction of mortality (e.g., all-cause and CV mortality) in dialysis patients receiving mainly or exclusively HDF.

This advantage results predominantly from a lower cardiovascular mortality, possibly due to better preservation of left ventricle mass and function. Improved intra-dialytic blood pressure stability may contribute to the beneficial effect of high volume post-dilution HDF on survival. Additional beneficial effects have been observed on endothelial dysfunction, vascular stiffness, on inflammation and oxidative stress markers or other biomarkers such as β 2-Microglobulin. The beneficial effect is not restricted to selected subgroups (e.g., elderly, diabetes, highly comorbid, high dialysis vintage) but tends to be observed through all spectrum of patients.

Interestingly, there are still no studies or case reports published reporting adverse clinical outcomes in online HDF treated patients confirming the safety of the therapy.

In this presentation, a review of most clinical findings and evidences will be discussed. Today, all clinical findings support the choice of high volume post-dilution HDF over the current dialysis modalities to improve dialysis outcomes. Further step to show superiority of high volume post-dilution HDF will be discussed as well as some missing finding such as patient experience.