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EFFICACY OF MEDIUM CUT-OFF DIALYZER AND COMPARISON WITH STANDARD HIGH-FLUX HEMODIALYSIS AND PREDILUTION ONLINE HEMODIAFILTRATION

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Objectives: Large middle molecular uremic toxins, that are poorly removed by conventional hemodialysis (HD) or online hemodiafiltration (OL-HDF), accumulate in HD patients to promote inflammation as well as adverse cardiovascular outcomes. Aim of the study is to evaluate efficacy of medium cut-off (MCO) dialyzers in removal of middle molecules in comparison to conventional high-flux HD and OL-HDF.

Methods: Six stable HD patients were enrolled and dialyzer and treatment efficacies were examined during a single midweek treatment with conventional high-flux HD, pre-dilution OL-HDF, and MCO dialyzer, respectively. Reduction ratio of various uremic toxins as well as other biochemical and hemodynamic profiles were assessed.

Results: MCO-HD showed greater RR for myoglobin and λ -type FLC compared to standard HF-HD and pre-dilution OL-HDF (RR myoglobin 63.1 ± 5.3 % versus 43.5 ± 8.9 %, and 49.8 ± 7.3 %, RR λ -type FLC 43.2 ± 5.6 % versus 26.8 ± 4.4 % and 33.0 ± 9.2 %, respectively, $P < 0.001$). In contrast, MCO-HD showed significantly lower RR for B2M compared to predilution OL-HDF (72.6 ± 3.8 , versus $80.1 \pm 4.9\%$, $P = 0.01$ by post hoc test). MCO-HD showed comparable RR of phosphate, urea, creatinine, and uric acid with standard HF-HD as well as predilution OL-HDF. Moreover, there was no significant difference among MCO-HD, HF-HD and OL-HDF for mean Kt/V (1.45 ± 0.20 , 1.51 ± 0.18 , and 1.51 ± 0.14 , respectively, $P = 0.82$) or RR albumin (4.9 ± 2.8 %, 1.7 ± 3.6 %, and 2.3 ± 4.1 %, respectively, $P = 0.22$) or hemodynamic profiles.

Conclusions: MCO-HD demonstrated superior removal of larger middle molecules and comparable removal of small and other middle molecules compared to standard HF-HD and predilution OL-HDF. Therefore, MCO-HD may be implemented in elderly patients with poor vascular access or in centers lacking access to complex OL-HDF hardware.