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Randomized controlled trial of medium cut-off or high-flux dialyzer on quality-of-life outcomes in maintenance hemodialysis patients

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Objectives: Novel medium cut-off (MCO) dialyzer could remove middle-sized molecules known to be associated with variable subjective symptoms. However, there is no clinical data about patient-reported outcomes after using MCO dialyzer. We investigated the effect of MCO dialyzer on the improvement of quality of life in maintenance hemodialysis (HD) patients.

Methods: In this randomized controlled trial, 50 HD patients with high-flux dialyzer for more than 3 months were assigned to either MCO or high-flux dialyzer. Kidney Disease Quality of Life Short Form 36 (KDQOL-36) and pruritus assessment using questionnaire and visual analog scale (VAS) were surveyed at baseline and 3 months after randomization. Reduction ratios of middle-sized molecules such as kappa and lambda free light chains (FLCs) were also evaluated.

Results: Two groups did not differ in laboratory markers including serum albumin at the baseline and follow-up period. Removal of kappa and lambda FLCs was significantly greater for MCO dialyzer than high-flux dialyzer (55.8 ± 15.7 % vs. 40.6 ± 14.6 %, p=0.001 and 56.1 ± 11.4 % vs. 42.5 ± 8.5 %, p<0.001). Patients with MCO dialyzer showed significantly higher scores at 3 months in the domain of physical functioning (75.2 ± 20.8 vs. 59.8 ± 30.1, p=0.042) and physical role (61.5 ± 37.6 vs. 39.0 ± 39.6, p=0.047) than patients with high-flux dialyzer. The mean scores of morning pruritus distribution (1.29 ± 0.46 vs. 1.64 ± 0.64, p=0.034) and frequency of scratching during sleep (0.25 ± 0.53 vs. 1.00 ± 1.47, p=0.023) were significantly lower in MCO group than high-flux group.

Conclusions:

MCO dialyzer improves patient-reported outcomes, especially physical component and uremic pruritus in the maintenance HD patients. HD using MCO dialyzer provides superior removal of kappa and lambda FLCs to high-flux HD. MCO dialyzer has non-significant effect on serum albumin concentration over 3 months of study duration. (Trial registration: cris.nih.go.kr, KCT0003026)