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Efficacy of Medium Cut-Off Dialyzer on Elimination of Free Light Chain Compared to High-flux Dialyzer in Patients undergoing Hemodialysis

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Objectives: Elevated serum free light chains (FLCs) levels, middle to large molecule uremic toxins, are reported in patients with renal impairment, due to the decreased capacity of their elimination. As FLC is associated with chronic inflammation and vascular calcification, elevated FLCs lead to high morbidity and mortality. Recent studies suggest that middle to large molecules are more efficiently removed by medium cut-off (MCO) dialyzers than high-flux dialyzer. This study aimed to investigate the efficacy of MCO dialyzer on elimination of FLC compared to high-flux dialyzer in patients undergoing hemodialysis.

Methods: A randomized prospective study was performed with 68 participants, divided into MCO dialyzer group and high-flux dialyzer group. Serum levels of middle to large molecules including kappa and lambda FLCs, and beta-2 microglobulin, and their reduction ratios were measured at baseline and after 6 months, and compared between two groups.

Results: The serum levels of albumin, calcium, inorganic phosphate and hemoglobin, and Kt/V did not differ between two groups. Lambda FLC level significantly decreased in MCO dialyzer group from 204.9±60.3 mg/L to 179.3±59.0 mg/L, while it increased from 191.6±52.0 mg/L to 198.8±78.2 mg/L in high-flux group after 6 months. The reduction ratio of kappa and lambda FLC in MCO group was 9.9±15.1% and 11.9±16.2% respectively. However, the level of beta-2 microglobulin did not show remarkable differences between two groups, as well as the reduction ratios.

Conclusions: Using MCO dialyzer shows more efficiency in reduction of FLCs, with preserved dialysis adequacy. Further studies are needed to establish the long-term effect of MCO dialyzer on clinical outcome