Effect of Dialysis Membranes on Inflammatory and Immune Processes in Hemodialysis

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Study Group

A total of 52 patients older than 18 years and under 65 years of age who have been undergoing hemodialysis for more than 3 months will be included in the study. The planned study time is 6 months. Patients will be randomized in two groups by a computer program. 26 patients were dialyzed by high-flux dialyzer and 26 patients by middle cut-off dialyser for 3 months. At the end of the third month, the dialysers will be crossing in the same groups. The study will end in three months after crossover.

Clinical Evaluation

All patients will be dialyzed according general recommendations with Kt/Vurea higher than 1.4. The dialysate flow rate and pump speed will be maintained at the recommended values according to the patient's vascular access pathway. Serum samples will be taken at 0 (beginning), 4th (90th day) and 7th (180th day) months in the beginning and at the end of dialysis. Blood count, electrolytes, serum albumin and total protein levels will be determined at 0, 4th and 7th months. Urea, creatinine, albumin, free light chain kappa and lambda, β 2 microglobulin, myoglobulin levels will be examined; Kt/Vurea values will be calculated. Between the two groups, serum light chain kappa, serum light chain lambda and β 2 microglobulin and myoglobulin levels will be compared. The decrease in serum albumin values over time will be compared between the two groups.

Anti-human CD4, anti-human CD4, anti-human CD16, anti-human CD19, and anti-human CD14 / CD45 fluorescent-labeled monoclonal antibodies will be used for immunophenotyping with flow-cytometry. Cell Quest (BD) and FlowJo analysis programs will be used for data analysis to determine cell groups.

Peripheral blood mononuclear cells will be isolated to determine IL-17A (Th17), IL-10 (Treg), IFN gamma and TNF alpha (Th1) and IL-4 (Th2) intracellular cytokine contents. Cells from culture will be staining with anti-CD3, anti-CD4, anti-CD8 and anti-CD25 monoclonal antibody to determine cell surface molecule expressions, and then undergo intracellular cytokine staining.

IL-17A, IL-10, IFN-gamma, TNF-alpha, IL-18, MCP-1, NLRP3, RANTES and calcification, which are specific for T cell subtypes by ELISA and luminex (multi-bead) method and evaluated as a marker of inflammation simultaneously in patient sera. The FGF-23 levels will be determined according to the manufacturer's instructions.

Statistical Analysis

The clinical and demographic characteristics of the patients were determined by the Student t-test if the distribution of the continuous variables was normal, if not with the Mann-Whitney U test; categorical variables will be compared with chi-square test. Kappa and lambda levels, serum albumin levels, Kt / V, FGF-23, intracellular cytokine levels if the distribution is normal with Student's t-test and if not with the Mann-Whitney U test. In cases where more than two groups have flow cytometry, ANOVA and Tukey's post-hoc test will be compared with Student's t-test in two groups.