RENAL TRANSPLANT ISCHEMIA/REPERFUSION INJURY CORRECTION WITH CYTOKINES ADSORPTION: EARLY AND LONG-TERM RESULTS

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OBJECTIVES:

to assess efficiency of **CPFA** for renal transplant ischemia/reperfusion injury severity management. To assess impact of the method on long-term outcomes of renal transplantation with transplants received from suboptimal donors (expanded criteria donors).

METHODS

We conducted a prospective randomized clinical trial. We applied coupled plasma filtration and adsorption (**CPFA** – fig. 1) in 33 patients of study group. After the operation each patient had one such procedure (procedure duration 8-10 hours). In the control group there were 33 patients who received paired transplants. All 66 transplants were received from expanded criteria donors. We investigated the cytokines serum concentrations (TNF, IL-4, IL-5, IL-6, IL-8, IL-10, IL-12p70) before transplantation, after reperfusion, 4, 8, 12, 24 hours after reperfusion, and 5 days after transplantation. We also investigated transplant function parameters (glomerular filtration rate (GFR), serum creatinine, daily proteinuria) 3, 6, and 12 months after transplantation. Repeated measures ANOVA with a posteriori Tukey test was used for statistical analysis.

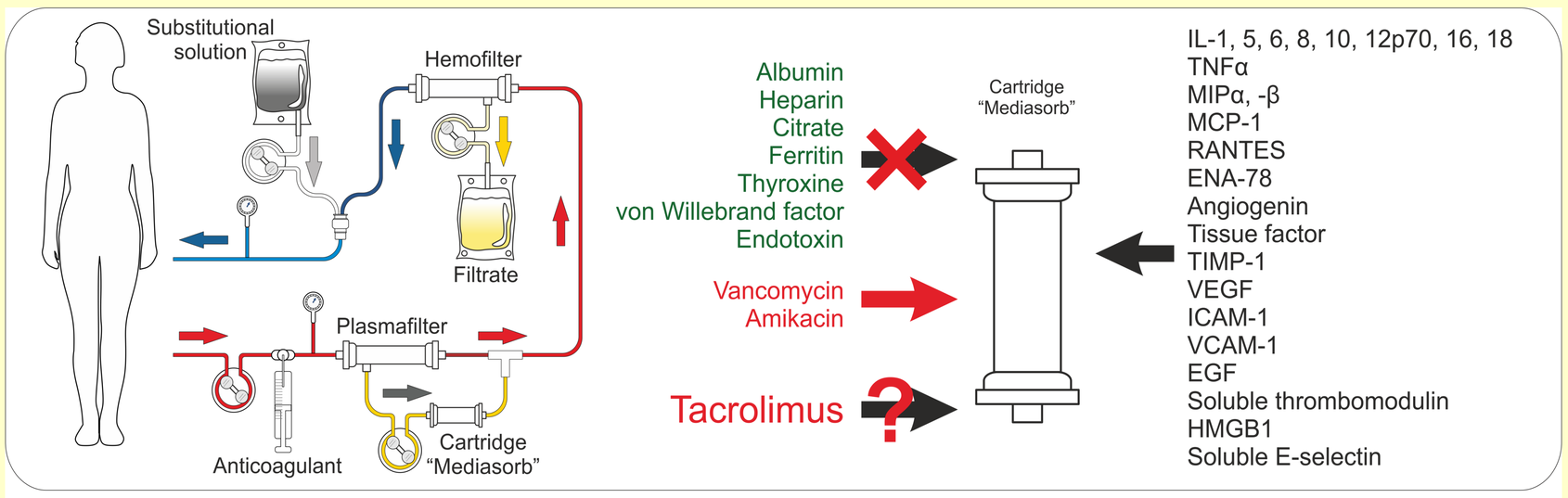

Figure 1. Scheme of the coupled plasma filtration and adsorption (**CPFA**).

RESULTS

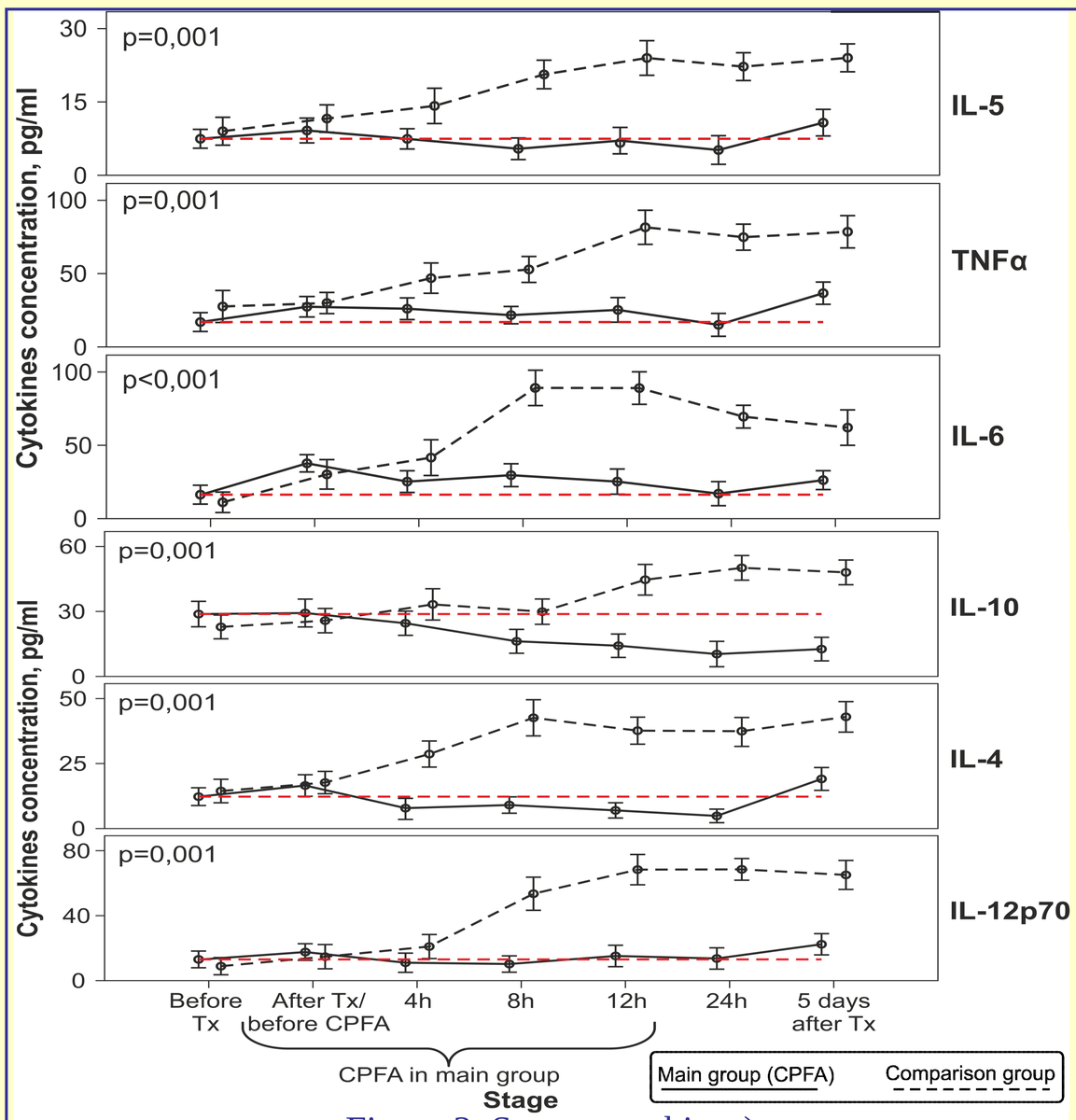

Figure 2. Serum cytokines).

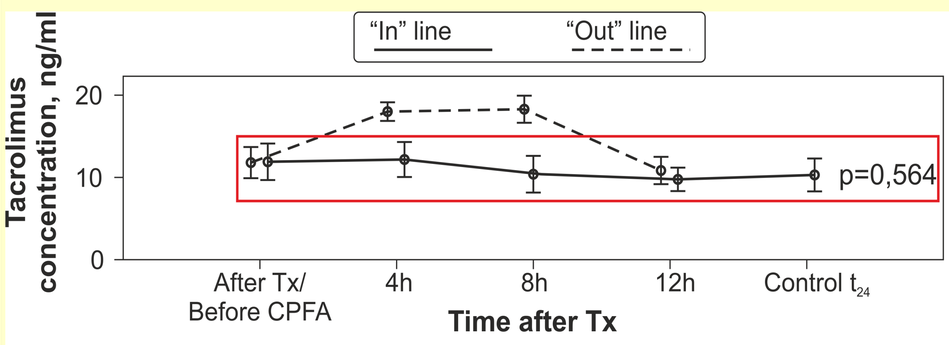

Figure 3. Tacrolimus concentration.

Ischemia/reperfusion is followed by a significant release of cytokines into blood that was observed in patients of control group – fig. 2. In addition to this, maximum peak was recorded 4-6 hours after reperfusion. In patients of the study group cytokine concentration remained stable after CPFA. Even 5 days after transplantation cytokine concentration was significantly lower than in control group. In patients of the main group transplant function improvement was observed: a higher rate of diuresis and GFR, blood creatinine improvement, microcirculation improvement (less resistive index).

CPFA has no effect on tacrolimus blood concentration - fig. 3.

3 months after transplantation patients of the main group had a significantly lower level of daily proteinuria (p>0.001); 6 months – higher GFR (p=0.001) and lower daily proteinuria (p=0.02) - fig. 4. 1 year after transplantation patients of the main group had lower creatinine plasma level (p=0.001), higher GFR (p=0.001), daily proteinuria 2.5 times lower (p=0.001) versus patients of control group.

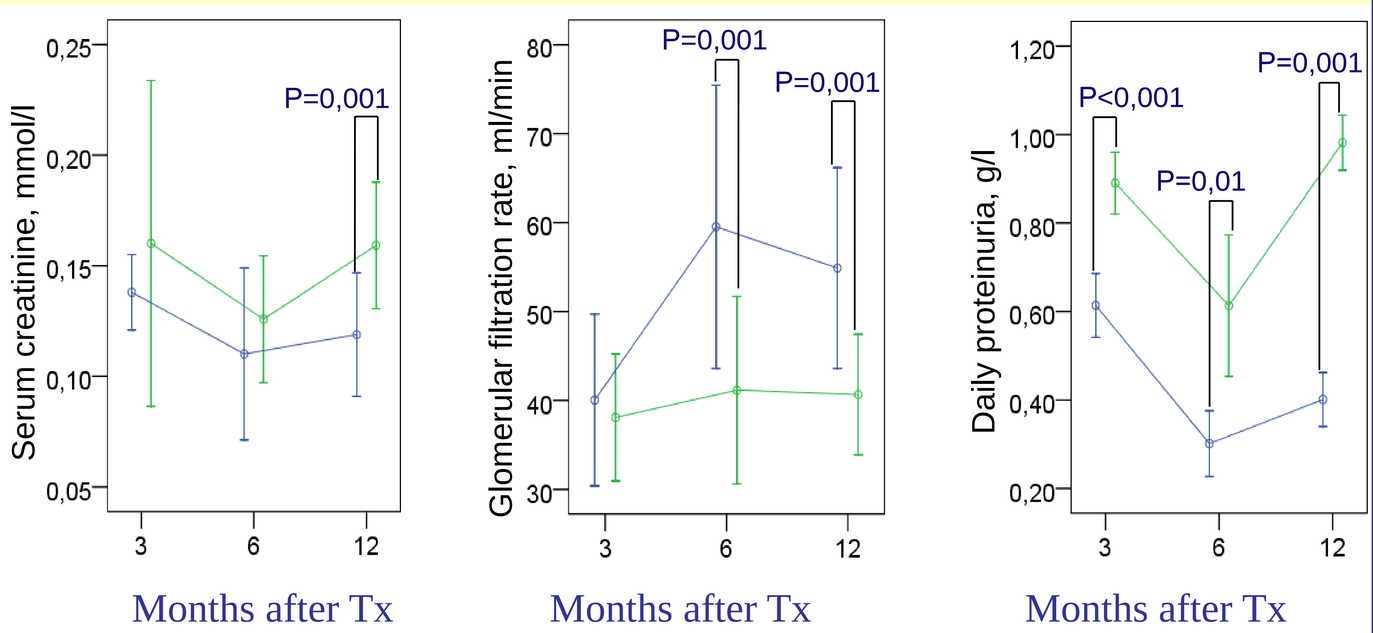

Figure 4. Clinical outcomes. **Main group. Control group.**

CONCLUSIONS

However, we believe that the selective removal of cytokines in the early postoperative period after kidney transplantation is an effective and necessary procedure and it may reduce the ischemia/reperfusion injury severity and improve outcomes of renal transplantation with transplants received from expanded criteria donors. This procedure is safe and highly efficient. The study assessing long-term outcomes is in progress.

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