DIALYSIS. PROTEIN-ENERGY WASTING, INFLAMMATION AND OXIDATIVE STRESS

EFFECT OF DIFFUSION AND FILTRATION ON CYTOKINE PRODUCTIONS FROM DIALYSIS PERIPHERAL BLOOD CELLS

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Introduction and Aims: Numerous studies have been carried out to investigate the solute removal efficiency of on-line haemodiafiltration (O-HDF). However, the effect of the dilution mode on peripheral blood cell damage during O-HDF has not been examined in detail. We studied the effects of dilution mode and diffusion on uraemic patients peripheral blood cells by producing various cytokines.

Methods: Twenty four patients were allocated to one session each predilution O-HDF (N=7), postdilution O-HDF (N=7), and haemodialysis (HD) (N=10). The treatment conditions were as follows: O-HDF: 4 hours at QB 280 mL/min, and QD total 500 mL/min, amount of substitution fluid, 84 L per session for predilution O-HDF, 10 L per session for post dilution O-HDF, HD: 4 hours at QB 280 mL/min, and QD total 500 mL/min. The MFX-U250 haemodiafilter (PES membrane: Nipro Co., Ltd., Osaka, Japan) was used for O-HDF, and PES-Da21 (PES membrane: Nipro Co., Ltd., Osaka, Japan) for HD. 2 mL heparinized blood samples were collected from the sample port of a blood circuit just before the start and the end of the treatment. 1 mL whole blood was diluted by 5 mL RPMI1640 (Nikken Biomedical Research Institute), and incubated under 37 degree for 24 hours. Interleukin-6 (IL-6) and pentraxin-3 (PTX3) in the culture medium supernatants were measured using the ELISA methods. In addition, WBC, platelet count and plasma high-sensitive CRP level were measured.

Results: Comparing the values before and after treatment, the ratio of IL-6 level decreased significantly in predilution O-HDF (99.5±36.7%) comparison to postdilution O-HDF (193.8±290.8%) and HD (137.7±99.5%). The ratio of PTX3 level decreased significantly in predilution O-HDF (140.5±59.7%) comparison to postdilution O-HDF (166.7±51.4%) and HD (161.0±74.6%). And Plasma hsCRP level decreased significantly in predilution O-HDF (101.9±19.1%) comparison to postdilution O-HDF (113.8±23.4%) and HD (112.6±20.5%). No significant changes of WBC and platelet count were observed in these three treatments.

Conclusions: Based on these results, there is a high possibility that the predilution O-HDF mode appeared to be a better dilution mode from the point of view of the effect on the peripheral blood cells, based on the results in IL-6, PTX3 production and plasma hsCRP level. The predilution O-HDF could be more favorable for the dialysis patients than postdilution O-HDF and HD mode.

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