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Theme : Clinical Research on PD Fluids and Regimens

Low Glucose/GDP Dialysis Regimen Results in Increased Mesothelial Regeneration and Vascular Permeability

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Introduction Both glucose and glucose degradation products present in peritoneal dialysis fluids (PDF) are thought to mediate progressive peritoneal worsening. **Methods** In a multi-centered, prospective, randomized cross-over study new CAPD patients were treated 4 times a day with conventional lactate-buffered PDF (standard regimen), or with a low glucose/GDP regimen: twice a day the bicarbonate/lactate PDF (Physioneal), once a day amino acid PDF (Nutrineal) and icodextrin PDF (Extraneal) for the overnight dwell (NEPP regimen). After 6 months of treatment the patients were switched to the other regimen for another 6 months. At start of the study (after a six-week run in period), after six months of treatment (just before the switch), and at the end of another six months 4-hours PET-test was performed. At the same time points overnight dialysates were analyzed for cells and biomarkers. Differences between both regimens were assessed by advanced generalized estimation equations (GEE) multivariate analysis. **Results** Forty-six patients finished the study, equally distributed over both groups. D4/D0 glucose was reduced and D/P creatinin was increased under NEPP regimen, $p < 0.01$ and $p < 0.02$ respectively, which indicates increased low molecular solute transport during NEPP. In the NEPP overnight dwells a two/three-fold increase was measured (median value) in cell numbers ($p < 0.001$), free floating mesothelial cells ($p < 0.0001$), CA125 ($p < 0.0001$), IL-6 ($p = 0.02$), IL-8 ($p = 0.001$), hyaluronan ($p < 0.0001$), bFGF ($p < 0.02$) and VEGF ($p < 0.0001$). All these parameters have been corrected for time effects and regimen sequence. Increased transport parameters during NEPP are completely lost after normalization for VEGF, whereas VEGF remained significantly increased during NEPP after normalization for glucose and GDP load ($p = 0.001$). **Conclusion** These results suggest an increased peritoneal inflammatory response accompanied by increased vascular permeability under NEPP, which might be related to icodextrin and/or amino acids exposure or related to daily changes of three different PDF.