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Theme : PD in Pediatric Patients

Comparison of Glucose Versus Icodextrin Based Peritoneal Dialysis (PD) Fluid with Proteomic Techniques in Children

Raaijmakers, R.¹, Pluk, W.¹, Schroder, C.H.², Monnens, L.A.H.¹, Willems, J.L.¹, Van den Heuvel, L.P.W.¹; University Medical Centre Radboud, Nijmegen¹, University Medical Centre Utrecht, Utrecht², Netherlands

Objective: Proteomic technologies in PD offer a high-throughput analysis of the proteins in peritoneal fluid. The proteome of different PD fluids may give important information about the functioning of the peritoneal membrane under different circumstances. In this study 3.86% glucose was compared to icodextrin. Methods: The dialysate of 6 matched pediatric PD patients was collected from 2-hour samples of peritoneal equilibrium tests, 3 with icodextrin and 3 with 3.86% glucose. PD samples were concentrated, proteins were separated on a 10% SDS-PAGE gel followed by in-gel digestion with trypsin. Extracted proteins were subjected to nanoscale liquid chromatography (nLC). Peptides were eluted into the LTQ-FT mass spectrometer by nano-electrospray ionization. Peptide mass and amino acid sequence were determined by subsequent MS and MS/MS cycles. Mass spectrometer data files were then searched against the IPI database using Mascot. Results: A total number of 304 proteins was identified in the PD fluid of the 6 patients. The three patients with 3.86% glucose PD fluid had more than 55% of the identified proteins in common with the three patients using icodextrin PD fluid. Proteins of interest concerning functioning and defense mechanisms of the membrane that were found uniquely in the three icodextrin samples but not in the three glucose samples were neutrophil defensin-1 and angiogenin. Fibulin-1 was found only in all three glucose samples but in none of the icodextrin samples. Conclusion: The proteome of different PD fluids gives insight in the different processes that occur in these fluids. Some interesting proteins were found only in all glucose PD samples and in none of the icodextrin PD samples and vice versa. In these group interesting proteins occurred, indicating a possible different pattern of inflammation and angiogenesis in icodextrin- versus glucose based PD fluids. Further quantitative research is needed to elucidate the exact meaning of these findings.