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Comparison of ex-vivo Phenotype of Human Peritoneal Mesothelial Cells (HPMCs) between Lactate-based Peritoneal Dialysis Solution and Bicarbonate/lactate-based Solution in CAPD Patients

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Comparison of ex-vivo Phenotype of Human Peritoneal Mesothelial Cells (HPMCs) between Lactate-based Peritoneal Dialysis Solution and Bicarbonate/lactate-based Solution in CAPD Patients

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Objectives : This study was designed to verify the impact of glucose degradation products (GDP) and kinds of buffer on epithelial to mesenchymal transition (EMT) in CAPD patients.

Methods : In a randomized, prospective study, age, gender and diabetes matched 108 incident PD patients were completed 12 months protocol. They were assigned to one of the four groups, lactate- based, high GDP solution (Stay · safe®, FMC, n=29, Lac- HG (S)), lactate- based, low GDP solution (Balance®, FMC, n=29, Lac- LG (B)), lactate- based, high GDP solution (Dianeal®, Baxter, n=25, Lac- HG (D)), and bicarbonate/lactate- based, low GDP solution (Physioneal®, Baxter, n=25, B/L- LG(P)). With expanded protocol, 29 patients completed 24 months protocol (Dianeal®, n=16 and Physioneal®, n= 13). HPMCs from overnight effluent were completely isolated and cultured on the T25 flask at 1st and every 6 months. Cell score was blindly measured by the same person at near confluence (score 1: cobble- stone shaped HPMCs, score 2: mixed, score 3: fibroblastoid cell). Cell numbers in effluent and T25 flask, pH in blood and effluent and D- CA125 were measured at 1st, 6th, 12th month. Independent T test and repeated measured ANOVA were used to analyze the data.

Results : Lac- LG (B) showed higher number of cells in effluent and T25 flask ($p<0.05$, $p<0.01$) and higher pH in effluent and blood ($p<0.01$, respectively) than Lac- HG (S). Lac- LG (B) showed higher D- CA125 (43.8, 47.7, 48.6 vs. 18.2, 21.0, 20.9 U/mL, at 1st, 6th, 12th months, $p<0.01$) and lower cell score (1.3, 1.64, 1.79 vs. 1.86, 1.95, 2.38, at 1st, 6th, 12th months, $p<0.05$) than Lac- HG (S). B/L- LG(P) showed higher pH in effluent ($p<0.05$) and higher cell score (1.78, 2.63, 2.52 vs. 1.76, 1.91, 1.65, at 1st, 6th, 12th months, $p<0.01$) than Lac- HG (D). Sub- analysis with icodextrin exclusion, there was similar result on cell score ($p=0.059$). With expanded 24 months results, B/L- LG (P) showed higher cell score ($p<0.01$) than Lac- HG (D).

Conclusion : Bicarbonate mixed low GDP solution showed higher EMT than lactated based solution in CAPD patients.

Key Words : CAPD, EMT, HPMCs