S-D20

The Impact of Bicarbonate/lactate-buffered Low GDP Solution on Aquaporin Function in CAPD Patients

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Objectives : This study was designed to compare the effect of glucose degradation products (GDP) and kinds of buffer on the aquaporin function in CAPD patients.

Methods : In a randomized, prospective study, gender and diabetes matched 88 incident PD patients (40 females, DM: 46, mean age: 52.37±13.07 years) 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=15, Lac- HG (D)), and bicarbonate/lactate- based, low GDP solution (Physioneal□, Baxter, n=15, B/L- LG (P)). One hour D/P sodium (D/P1 Na), 4 hour D/P Cr (D/P 4 Cr) and ultrafiltration volume (UFV) during 4.25% PET were measured at 1st, 6th, and 12th month. Independent T- test and repeated measures ANOVA were used to analyze the data.

Results : Lac- LG (B) group showed significantly lower UFV during PET (p=0.000) and higher D/P 4 Cr (p=0.015) comparing with Lac- HG (S) group. But, B/L- LG (P) group didn't show significantly different UFV during PET and D/P 4Cr comparing with Lac- HG (D). Low GDP solution (B/L- LG (P), Lac- LG (B), n=44) showed lower D/P1 Na than high GDP solution (Lac- HG (D), Lac- HG (S), n=44) (p=0.053). In a subgroup analysis, B/L- LG (P) showed lower D/P1 Na than Lac- HG (D) (0.89±0.02, 0.89±0.02, 0.88±0.03 vs. 0.091±0.02, 0.91±0.03, 0.90±0.03, at 1st, 6th, 12th month, p=0.013). But there was no significant difference of D/P1 Na between Lac- LG (B) and Lac- HG (S).

Conclusion : Bicarbonate containing low GDP solution showed beneficial effect on preservation of aquaporin function with time on PD.

Key Words : CAPD, aquaporin, GDP