PO0985
Dual Therapy with JAK1/2 Inhibitor and Losartan Attenuates Dialyse-Induced Angiogenesis in Polycystic Rats
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Background: Long term peritoneal dialysis (PD) is limited by reduced efficacy over time. Early peritoneal membrane (PM) injury is characterized by inflammation which progresses to hyperfibrinolysis and fibrosis. JAK-STAT signaling mediates inflammatory pathways, including angiotensin signaling. Our previous study showed dual therapy with JAK1/2 inhibitor (JAK1/2i) and an ARB maintains PM structure and function in rats with polycystic kidneys (PCK) chronically infused with 4.25% Dianel x 16 ks. By using VEGFR2 as an endothelial marker, we further investigated if this dual therapy can attenuate chronic dialysate infusion induced hyperfibrinolysis in this rat model.

Methods: PCK rats were used. Dialysate infusions were performed BID via an implanted subcutaneous port in the neck tunneled to the intraperitoneal cavity. The following treatments were administered: (1) No surgery/inusions; (2) 4.25% Dianel; (3) 4.25% Dianel + JAK1/2i (5mg/kg BID); (4) 4.25% Dianel + Losartan (5mg/kg BID); and (5) 4.25% Dianel + Losartan + JAK1/2i (5mg/kg BID each). Parietal peritoneum was used for immunohistochemical staining of VEGFR2, which was digitally quantified by using Qu Path program. Data were analyzed by one-way-ANOVA followed by Tukey test. Results are mean ± SEM.

Results: VEGFR2 staining was significantly elevated after 16 weeks IP infusion of 4.25% Dianel alone. JAK1/2i significantly reduced VEGFR2 expression; losartan tended to reduce VEGFR2, but this did not reach significance. Dual therapy with JAK1/2i and losartan resulted in the greatest reduction of VEGFR2.

Conclusions: Long-term JAK1/2, or JAK1/2 + losartan intraperitoneal treatment reduces angiogenesis. Angiotensin inhibition is advocated to maintain residual renal function, by adding JAK1/2i, the combination also protects peritoneal structure/function by reducing angiogenesis.

PO0986
The Effect of Far-Infrared Therapy on the Peritoneal Expression of Glucose Degradation Products in Diabetic Patients on Peritoneal Dialysis
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Background: Peritoneal dialysis (PD) is a treatment modality for end-stage renal disease (ESRD) patients. Dextrose is a common osmotic agent used in PD solutions and its absorption may exacerbate diabetes mellitus. PD solutions also contain glucose degradation products (GDPs) that may lead to encapsulating peritoneal sclerosis (EPS). A previous study showed that far-infrared (FIR) therapy improved a patient’s gastrointestinal symptoms due to EPS. Due to limited literature, this study aims to investigate dialysate GDPs and peritoneal function in diabetic patients on PD.

Methods: A prospective analysis conducted in a single center. The participants were recruited from the peritoneal dialysis outpatient department from November 25, 2016 to September 5, 2018. We included the patients who met the following criteria: (1) ESRD patients aged 20-90 years without receiving FIR therapy within 12 months; (2) recruiting ambulatory peritoneal dialysis or automated peritoneal dialysis; (3) no history of peritonitis, cerebrovascular accident, myocardial infarction, or receiving any cardiovascular intervention in the past 3 months. Patients were allocated to two groups based on their underlying DM history. Both groups of PD patients received FIR therapy for 6 months. We collected the last daily bag of peritoneal dialysate and compared the dialysate concentration of GDPs and clinical data in PD patients pre- and post-FIR therapy.

Results: Thirty-three PD patients were enrolled and underwent 40 min of FIR therapy twice daily for six months. We demonstrated the effect of FIR therapy on the following: (1) decrease of methylglyoxal (p = 0.02), furfural (p = 0.005), and 5-hydroxymethylfurfural (p = 0.03), (2) increase of D/D0 glucose ratio (p = 0.03), and (3) decrease of potassium levels (p = 0.008) in both DM and non-DM patients, as well as (4) maintenance and increase of peritoneal Kt/V in DM and non-DM patients, respectively (p = 0.03). FIR therapy is a non-invasive intervention that can decrease dialysate GDPs in PD patients by improving peritoneal transport rate and solute removal clearance, while also maintaining dialysis adequacy.

Conclusions: In conclusion, our study demonstrated that FIR therapy can decrease PD patients’dialysate GDPs by improving peritoneal transport rate and solute removal clearance, while also maintaining dialysis adequacy.

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Cumulative Dialysate Glucose Exposure Is a Risk Factor for Peritoneal Sclerosis in Pediatric Peritoneal Dialysis Patients Using Neutral-PH Fluids
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Background: The benefits of neutral-pH fluids for preventing peritoneal dialysis (PD)-related peritoneal sclerosis have been established, however, advanced peritoneal sclerosis still has been described in pediatric PD patients using neutral-pH fluids (Kidney Int 2018). The factors associated with peritoneal pathological changes after long-term use of neutral-pH fluids have not been elucidated.

Methods: Pediatric PD patients using only conventional acidic fluids (conventional group) and those using only neutral-pH fluids (neutral-pH group, n=33) for more than one year were analyzed. Propensity score matching was performed to compare the peritoneal pathological changes between groups. Clinical risk factors including PD duration and cumulative dialysate glucose exposure for peritoneal pathological changes in the neutral-pH group were analyzed using generalized linear model. Furthermore, immunohistochemistry studies were performed on vascular endothelial growth factor-α (VEGF-α), cytoketatin, an epithelial marker, and α-smooth muscle actin (α-SMA); a myofibroblastic marker of epithelial-mesenchymal transition (EMT).

Results: Age at biopsy was 1.5 [8-18] years (median [IQR]) and duration of dialysis was 3.2 [1.7-5.3] years. The neutral-pH group showed less peritoneal deterioration except for higher submesothelial microvesSEL density (P = 0.01) than conventional group. In the neutral-pH group, the cumulative dialysate glucose exposure was an independent risk factor for increased thickness of the submesothelial compact zone (OR, 1.001; 95%CI, 1.001-1.007) and submesothelial microvesSEL density [OR, 1.003; 95%CI, 1.000-1.005]. Cumulative dialysate glucose exposure correlated with the proportion of VEGF-α-positive areas (P = 0.01, r=0.55). In immunofluorescence study, VEGF-α (+) cells comprised cytoketatin (+) cells and α-SMA (+) cells.

Conclusions: The neutral-pH fluids showed less deteriorations of the peritoneal membrane than acidic fluids except for increased angiogenesis. Cumulative dialysate glucose exposure was an independent risk factor for peritoneal fibrosis and angiogenesis in pediatric patients using neutral-pH fluids, which might be associated with increased VEGF-α production by mesothelial cells presenting EMT.

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Predicting Patient and Technique Survival in a Cohort of Incident Peritoneal Dialysis (PD) Patients According to Peritoneal Small Solutes Transport Rate (PSTR)
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Background: The association between PSTR and clinical outcomes in patients undergoing chronic peritoneal dialysis (PD) is uncertain. We explored the association between PSTR with mortality and technique survival in a large cohort of incident patients undergoing PD in Colombia.

Methods: In a cross-sectional study, 8170 PD patients, treated with APD (2705, 33.1%) and with CAPD (5465, 66.9%), who underwent peritoneal equilibration test to determine dialysate/plasma glucose ratio, 4 hours were classified into low (16.0%), slow average (35.4%), fast average (32.9%) and fast (15.7%) PSTR categories. Demographic, clinical and laboratory variables were evaluated. During median follow-up of two years, 2633 (32.2%) patients died, 1079 (13.2%) patients transferred to hemodialysis, and 661 (8.1%) patients underwent renal transplantation. All-cause and cardiovascular disease (CVD) mortality risk and technique survival were analyzed with competing-risk regression with transplantation as competing risk.

Results: Patients with fast as compared to slow PSTR were older, more often male or diabetic (DM), and had lower Hb and serum albumin levels. In competing risk analysis, after adjusting for age, sex, body mass index, residual kidney function, presence of diabetes and hypertension and circulating albumin, Hb, and phosphate levels, higher PSTR associated with greater risk (subdistribution hazard ratio, SHR) for all-cause mortality (fast average: SHR 1.13, 95%CI 1.06-1.20; p=0.04) and fast: SHR 1.19, 95% CI 1.14-1.26 (p=0.01), and CVD-related mortality (fast average: SHR 1.18, 95% CI 0.99-1.41; p=0.05) and fast: SHR 1.19, 95% CI 0.97-1.46; p=0.08), and reduced technique survival (fast average: SHR 1.15, 95%CI 0.95-1.38; p=0.13) and fast: SHR 1.24, 95% CI 1.06-1.43 (p=0.05).

Conclusions: These results suggest that fast and fast average PSTR associates with increased mortality risk and tendency towards reduced technique survival when analyzed using adjusted competing-risk regression models.

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