PO1010
Higher Serum Total Cholesterol to High-Density Lipoprotein Cholesterol Ratio Was Associated with Increased Mortality Among Incident Peritoneal Dialysis Patients
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Background: A few studies have shown that serum total cholesterol to high-density lipoprotein cholesterol ratio (TC/HDLC) was a risk factor for cardiovascular mortality in the general populations. This study aimed to evaluate the association of TC/HDLC with mortality in incident peritoneal dialysis patients.

Methods: We enrolled Total of 6,300 incident peritoneal dialysis patients from 2008 to 2015 in a multi-center, prospective cohort study of Korea. Participants were stratified into quintiles according to the baseline TC, HDL-C, or TC/HDLC. The association between all-cause mortality and each lipid profile was evaluated using multivariate Cox regression analysis.

Results: During a median follow-up period of 70.3 ± 25.2 months, 185 deaths were recorded. The median TC/HDLC was 4.54 ± 2.51. Highest TC/HDLC group showed highest body mass index, percentage of diabetes, and serum albumin level. Multivariable analysis revealed that the highest quintile of the TC/HDLC (≥5.60) was associated with increased risk of all-cause mortality (hazard ratio 1.49, 95% confidence interval 1.04 to 2.76; P = 0.036), whereas neither of TC and HDL were associated with mortality. Increased serum TC/HDLC was also independent risk factor for mortality in the patients with old age over 50 years, non-diabetes, and any cardiovascular disease.

Conclusions: The single lipid marker of TC or HDL-C could not predict mortality in PD patients. However, non-traditional lipid profile such as increased serum TC/HDLC ratio was independently associated with an increased risk of all-cause mortality in PD patients.

PO1011
Peritoneal Dialysis Caregiver Scope and Functions: A Systematic Scoping Review
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Background: Caregivers play important roles in peritoneal dialysis (PD) care. Classifying PD self-care tasks is important for determining the PD caregiver roles. As the scope and functions of PD caregiver in published literature have been inconsistent, we aimed to systematically explore the variations of the term caregiver in high-quality PD studies.

Methods: We performed a systematic search using PubMed, Embase, and CENTRAL for randomized controlled trials and observational studies relevant to a caregiver in ESRD patients with PD in the English language up to February 20th, 2020. Outcomes were choices of words used in articles for “caregiver,” the definition of “caregiver,” persons defined as caregiver, and detailed functions of caregivers.

Results: Of 2,514 potential studies relevant to a caregiver in ESRD patients with PD, 299 theme-related abstracts were selected for further full-text articles screening against eligibility criteria, and 111 were included in the systematic review (72,101 patients in 34 countries). In terms of word choice, “caregiver(s)” was used in 86.4%, “caree(s)” in 20.7%, and other words were used in 13.5% of included studies. Only 8.1% of studies gave the explicit definitions of those words. The most referred person is the parents (40.5%), followed by a spouse (37.8%), other family members (37.8%), children (34.2%), non-relative non-healthcare workers (25.2%), friends (20.7%), and healthcare workers (19.8%). The explanation of functions for each word comprises 41.4%, with the PD-non-relative non-healthcare workers (25.2%), friends (20.7%), and healthcare workers (40.5%), followed by a spouse (37.8%), other family members (37.8%), children (34.2%).

Conclusions: PD caregiver has been broadly defined and vary across studies. PD-specific functions should be used for making the definition of PD caregiver clearer.
Methods: An end-vein to side-artery AVF was surgically created in the femoral vessels of rats which had previously been subjected to uremia via subtotal nephrectomy. At 1 and 2 weeks after AVF formation the arterial and venous lumens of the AVF were harvested for the assessment of gene and protein expression and the assay of SA-β-Gal activity. Femoral veins and arteries from rats subjected to sham surgery were used as controls.

Results: At 1 week after AVF creation mRNA levels of senescence drivers p16 and p21 were markedly elevated in AVF veins compared to sham veins, as were p21 protein levels; the AVF artery also displayed elevated p21 protein levels at this time point. At 2 weeks, p21 protein was again upregulated in both the vein and artery of the AVF, and protein levels of an upstream mediator in the p21 senescence pathway, p53, were significantly increased in the AVF artery; p53 levels did not achieve significance (p=0.083) in the AVF vein at this time point. Upregulation of SASP factors was also observed in the AVF vein at 1 week: mRNA expression of PAI-1, IL-6, TNF-α, MCP-1 and CCL2 was robustly increased as compared to sham veins at 1 week after AVF creation. Additionally, miR21, which has been associated with vascular senescence, was markedly elevated in the AVF vein at 1 week post AVF placement. Finally, SA-β-Gal activity, an established marker of senescence was significantly increased in both the artery and vein compared to their sham counterparts at both 1 and 2 weeks post AVF surgery.

Conclusions: Using established criteria, this study demonstrates that the rat femoral AVF in the setting of CKD has a senescent phenotype similar to the murine AVF-CKD model. These findings thus demonstrate the development of senescence in another species subjected to an AVF in the presence of uremia.

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PO1015
The Adaptive Response of the Vein to CKD: A Transcriptomics Perspective
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Background: The impact of CKD on the venous transcriptome, likely affecting basic cell functions such as metabolism and proliferation, remains unknown, particularly in veins, despite their fundamental role as conduits for hemodialysis.

Methods: In this study, we investigated the CKD fingerprint on the transcriptome of basilic veins by analyzing 48 pre-access veins from end-stage renal disease patients and 20 veins from non-CKD trauma donors by bulk RNA sequencing.

Results: We uncovered 16,893 differentially expressed genes (DEG) between CKD and control individuals (log FoldChange>1, FDR<0.05). The presence of kidney disease caused a noticeable decrease in transcriptional activity in veins, with the downregulation of >97% of DEG transcripts. These included 6,081 non-coding RNAs, 3,826 protein-coding genes, and other miscellaneous transcripts. In contrast, a unique set of 462 genes was upregulated in CKD veins vs. controls, 161 of which corresponded to non-coding RNAs, 201 to protein-coding genes, and the rest to minor RNA biotypes. Gene set enrichment analysis (GSEA) identified a suppression of pathways related to vascular maintenance, cell morphogenesis, cell metabolism, and microtubule-based cytoskeletal functions. Interestingly, the protein-coding genes upregulated in CKD veins belonged to processes related to gas transport and detoxification of oxidative stress byproducts.

Conclusions: In conclusion, we have uncovered a profound suppressive effect of CKD on the venous transcriptome, likely affecting basic cell functions such as metabolism, proliferation, cell division, and migration. We also identified a transcriptomic signature of upregulated genes in response to oxidative stress which may play a fundamental role in cell survival in the CKD environment.

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PO1016
Inhibition of Phosphodiesterase Type 5A Prevents Pathological Cardiac Remodeling Following Arteriovenous Fistula Creation
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Background: Cardiac events are the most common etiology of mortality in hemodialysis patients. The gold standard of vascular access, the arteriovenous fistula (AVF), may adversely affect cardiac structural and functional remodeling leading to heart failure. We hypothesize that inhibition of cGMP catalysis with a selective phosphodiesterase type 5A (PDE5A) inhibitor, sildenafil, may induce more favorable cardiac remodeling following AVF creation.

Methods: Sildenafil was administered to 12-16 weeks old Sprague-Dawley rats two weeks prior to AVF creation and continued until sacrifice at 28 days. Cardiac structural and functional changes were evaluated by 1) 2D-echocardiography 2) measurement of collagen volume and oxidative stress and 3) evaluation of cardiomyocyte cytoskeletal-mitochondrial architecture.

Results: Sildenafil treatment significantly improve pathological collagen degradation, reduces HNE4 expression, reverse desmin degradation and focal mitochondrial clustering following AVF creation, as compared to the control. We also observed a significant increase in cardiac output and stroke volume without reversing LV dilation which may suggest improvement in cardiac contractility.

Conclusions: PDE5A inhibition may provide a new treatment strategy for pathological cardiac remodeling following AVF creation.

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