KSN 2021
FULLY VIRTUAL MEETING
September 02 (Thu) - 05 (Sun)

Oral Communication Abstract
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PROTEOMIC PROFILE OF MESOTHELIAL EXOSOMES ISOLATED FROM PERITONEAL DIALYSIS EFFLUENT OF CHILDREN WITH FOCAL SEGMENTAL GLOMERULOSCLEROSIS

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Objectives: Peritoneal dialysis (PD) is the worldwide recognized preferred dialysis treatment for children affected by end-stage kidney disease (ESKD). However, due to the unphysiological composition of PD fluids, the peritoneal membrane (PM) of these patients may undergo structural and functional alterations, which may cause fibrosis. Several factors may accelerate this process and primary kidney disease may have a causative role. In particular, patients affected by corticoresistant primary focal segmental glomerulosclerosis), a rare glomerular disease leading to nephrotic syndrome and ESKD, seem more prone to develop peritoneal fibrosis. The mechanism causing this predisposition is still unrecognized.

Methods: To better define this condition, we carried out, for the first time, a new comprehensive comparative proteomic mass spectrometry analysis of mesothelial exosomes from peritoneal dialysis effluent (PDE) of 6 pediatric patients with focal segmental glomerular sclerosis (FSGS) *versus* 6 patients affected by other primary renal diseases (No FSGS).

Results: Our omic study demonstrated that, despite the high overlap in the protein milieu between the two study groups, machine learning allowed to identify a core list of 40 proteins, with ANXA13 as the most promising potential biomarker, to distinguish peritoneal dialysis effluent exosomes of FSGS from No FSGS patients (with 100% accuracy). Additionally, the Weight Gene Co-expression Network Analysis algorithm identified 17 proteins, with PTP4A1 as most promising potential biomarker, associated to PD vintage and decrease of PM function.

Conclusions: Altogether, data demonstrate that mesothelial cells of FSGS patients are more prone to activate pro-fibrotic machinery with exosomes having a primary role in this process. Finally, our results highlighted that in FSGS patients particular attention should be paid to use more biocompatible dialysis solutions, reduce the length of time on PD and personalize PD regimens to minimize the risk of rapid loss of PM function or development of encapsulating peritoneal sclerosis.

Weighted gene co-expression analysis of exosomes isolated from the peritoneal dialysis effluent of FSGS and No FSGS

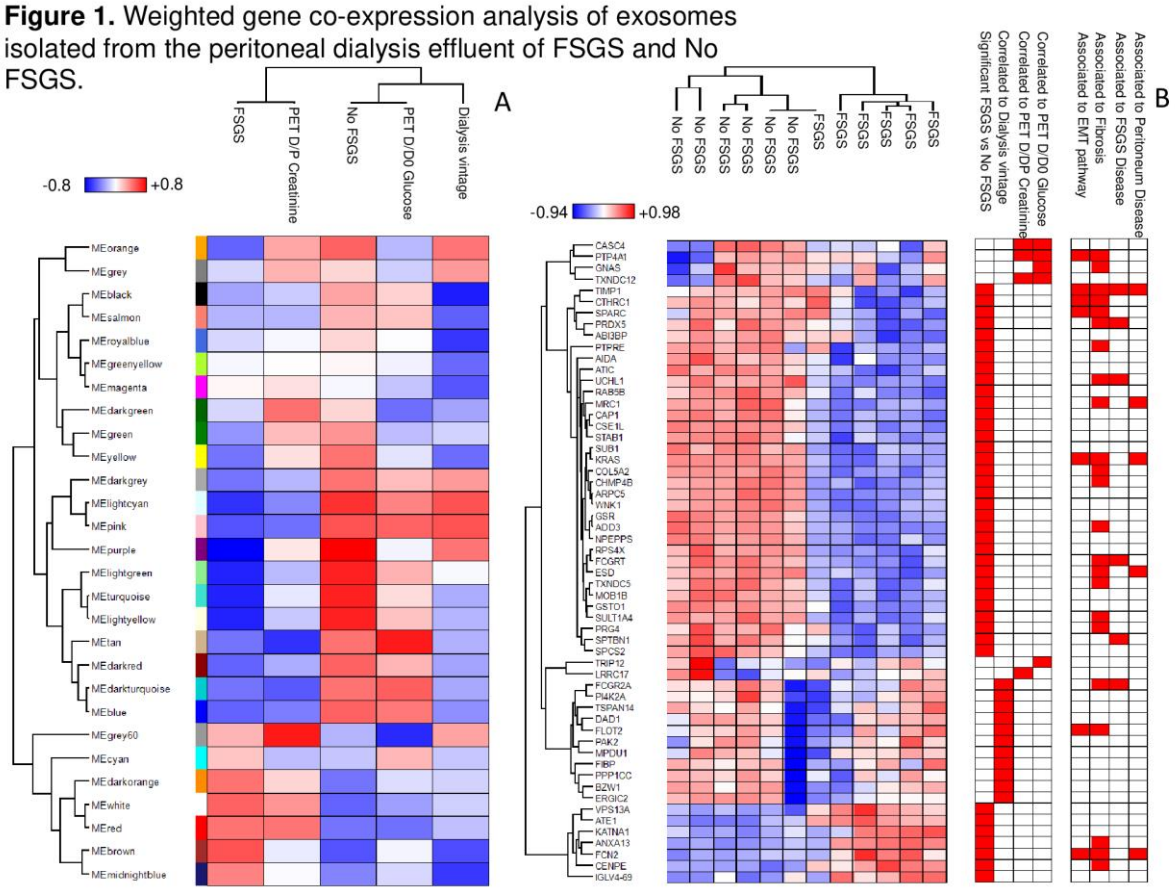

Figure 1. Weighted gene co-expression analysis of exosomes isolated from the peritoneal dialysis effluent of FSGS and No FSGS.

Volcano plot of univariate statistical analysis of peritoneal dialysis effluent exosomes from FSGS and No FSGS samples and heatmap of statistically significant proteins

Figure 2. Volcano plot of univariate statistical analysis of peritoneal dialysis effluent exosomes from FSGS and No FSGS samples and heatmap of statistically significant proteins