

# KSN 2016 Abstract Submission

## *Dialysis*

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### **Tight junction protein expressions from peritoneal dialysis effluent**

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**Background:** We hypothesized that tight junction (TJ) proteins may have roles in paracellular transport of solute and water in peritoneal dialysis (PD) patients. Previous studies on TJ proteins in PD patients were only from cultured human peritoneal mesothelial cells. Here, we explored expression of TJ proteins directly from PD effluent and investigated their relationship with functional parameters in performing PD.

**Methods:** PD effluents were collected for the previous 24 hours from 10 patients when they visited outpatient clinic for the scheduled peritoneal equilibration test (PET) using a 4.25% glucose solution over 4 hours. Different molecular sizes (3 kDa, 30 kDa, and 100 kDa) of Amicon Ultra-15 Centrifugal Filter Units were used to concentrate proteins in PD effluents before immunoblot analyses for occludin, ZO-1, claudin-1, and claudin-15 were carried out. We also collected clinical data including patient demographic characteristics, fundamental laboratory findings, residual renal function, peritoneal clearance, and results of PET.

**Results:** Immunoblotting from PD effluents revealed discrete bands of occludin (~65 kDa), ZO-1 (~215 kD), claudin-1 (~22 kDa), and claudin-15 (~22kDa) in all 10 patients. The expression level of ZO-1 was inversely correlated with peritoneal KT/V urea ( $r=0.64$ ,  $P<0.05$ ), and the claudin-15 expression was inversely correlated with daily peritoneal ultrafiltration ( $r=0.66$ ,  $P<0.05$ ). According to the transport characteristics in PET, patients were grouped into those with high-average (HA,  $n=3$ ) and low-average (LA,  $n=7$ ). The expression of occludin, ZO-1, and claudin-1 were not significantly different between HA and LA. However, the abundance of claudin-15 protein was significantly decreased in HA compared with LA ( $47 \pm 6\%$  vs.  $123 \pm 14\%$ ,  $P<0.05$ ).

**Conclusion:** In this pilot study, we could detect significant levels of TJ proteins from the PD effluent and suggest the possibility of new peritoneal functional biomarkers. In particular, the roles of peritoneal claudin-15 and ZO-1 in PD patients need to be investigated by further studies.

**Keywords:** claudin-15, peritoneal dialysis, peritoneal transport, tight junction, ultrafiltration