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Dialysis

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The effect of periostin on the progression of peritoneal fibrosis

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Background: Peritoneal fibrosis limits long-term peritoneal dialysis (PD). Periostin, a matricellular protein, was initially identified in osteoblasts as an adhesion molecule during bone formation. Recently, the role periostin has been reported in diverse processes and pathologies in tissue remodeling through the promotion of adhesion, cell survival, cellular dedifferentiation, and fibrogenesis. However, its role in peritoneal fibrosis is not known well.

Methods: We investigated expression of periostin in overnight PD effluents using the enzyme linked immunosorbent assays from 127 end-stage renal disease patients and *in vivo* in C57BL/6 mice with peritoneal fibrosis model that was induced by intraperitoneal injection of 0.1% chlorhexidine solution.

Results: Mean periostin protein concentration was 6,542.7 pg/mL in first overnight effluents (1 month after start of PD) and 7,404.0 pg/mL in 1 year effluents of the patients. Peritoneal transport type and equilibration ratios between dialysate and plasma for creatinine were significantly related with the periostin level of the 1 year effluents of the patients. Periostin expression was strongly induced in peritoneal fibrosis model. Periostin was expressed predominantly in submesothelium and in lesser abundance in upper margin of abdominal muscle layer of mice with peritoneal fibrosis. Periostin messenger RNA was increased in peritoneal fibrosis model compared to the control. Messenger RNA expression of monocyte chemoattractant protein-1, α -smooth muscle actin, fibronectin and collagen 1 was also increased in peritoneal fibrosis model.

Conclusion: Periostin expression becomes higher in the peritoneal cavity of PD patients and its level can differentiate the peritoneal permeability after 1 year from the start of PD. In addition, periostin expression is related in peritoneal fibrosis in C57BL/6 mice. Thus, our

study implicate periostin signaling in the mediation of peritoneal fibrosis as a consequence of PD.

Keywords: fibrosis, periostin, peritoneal dialysis