

복막 중피 세포에서 분비되는 cathepsin B와 복막투과도와의 관계

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Cathepsin B, Secreted by Peritoneal Mesothelial Cells, is Associated with Solute Transport Rate in Peritoneal Dialysis

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Introduction : During peritoneal dialysis (PD), exposure to nonphysiologic PD solutions causes peritoneal fibrosis which is associated with change in solute transport and ultrafiltration failure. Cathepsin B, a potent cysteine protease, degrades extracellular matrix and also regulates multiple process including endothelial neovascularization, antigen presentation, cell growth, and apoptosis. We studied the association of cathepsin B, with its inhibitor cystatin C, in peritoneal effluents with the peritoneal membrane characteristics, and verified the secretion of cathepsin B by peritoneal mesothelial cells

Method : In this prospective cohort study, a total of 73 samples from 68 PD patients were collected. We measured serum and PD effluent cystatin C and procathepsin B, and effluent CA 125. Modified peritoneal equilibrium test, Kt/V, and glomerular filtration rate were also measured. To verify the secretion of cathepsin B by peritoneal mesothelial cells, primary cultured human peritoneal mesothelial cells (HPMC) were stimulated by high levels of glucose, mannitol, lipopolysaccharide (LPS), and transforming growth factor (TGF)- β and then we measured procathepsin-B in the supernatants.

Results : Mean age of the subjects was 59 ± 13 years and duration of PD was 19.9 ± 20.5 months. Serum and effluent cystatin C were 4.4 ± 1.3 and 0.7 ± 0.4 mg/L and procathepsin B were 3.6 ± 1.6 and 7.2 ± 5.3 g/L, respectively. Effluent procathepsin B was positively correlated with effluent CA125 ($r=0.427$, $p<0.001$), D/Pcr ($r=0.473$, $p<0.001$), GFR ($r=0.308$, $p=0.008$), and serum hemoglobin ($r=0.301$, $p=0.01$), and negatively correlated with serum albumin ($r=-0.393$, $p=0.001$), and phosphorus ($r=-0.324$, $p=0.005$). Procathepsin B in the supernatants of HPMC was not affected by treatment of mannitol or glucose, but elevated by treatment of LPS and TGF- β . Conclusion. Effluent procathepsin B level was 2-fold higher than in the serum, and was significantly correlated with the dialysate CA125 and solute transport rate. Treatment with LPS or TGF- β stimulated the production of procathepsin-B from HPMC.

Key Words : 복막투석, 복막투과도, 카텝신B

Peritoneal dialysis, Peritoneal permeability, Cathepsin B