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복막투석 동물 모델에서 복막투석 도관과 관련된 복막의 염증과 변화에 대한 스테로이드의 효과

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The Effect of Steroid on the Peritoneal Catheter-related Inflammation and Alteration of Peritoneal Membrane in an Animal model of Peritoneal Dialysis

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Introduction and aims : Exposure of the peritoneum to glucose containing dialysis solution leads to deterioration of peritoneal function with alteration of peritoneal histology. However, peritoneal catheter itself causes peritoneal inflammatory reaction and thereby enhancing the harmful effect of peritoneal dialysis solution. This study aims to evaluate the effect of steroid during early period after catheter insertion on the catheter-related peritoneal inflammation and on the functional and morphologic changes of peritoneum in an animal model of peritoneal dialysis (PD).

Methods : Male SD rats (n=34) were divided into five different groups: Group C (n=6), rats with no catheter, Group CC (n=6), rats with peritoneal catheter but no dialysis, Group CC-S (n=6), rats with peritoneal catheter and treated with dexamethasone (0.2 mg/kg/day) for 7 days following catheter insertion but no dialysis, Group D (n=8), rats infused with 4.25% glucose dialysis solution via peritoneal catheter for 28 days and Group D-S (n=8), rats with same procedure to group D but treated with dexamethasone for 7 days. Peritoneal function test was performed on baseline, 3rd, 7th, 14th and 28th day with dialysate culture. TNF-α and IL-1β were measured in drained dialysate and morphometric analysis was performed with peritoneal tissue.

Results : D/D0 glucose significantly reduced in Group D compared to control. Steroid treatment in Group CCS did not affect peritoneal function (D/D0 glucose) compared to Group CC on day 7, 14 and 28, whereas steroid treatment in Group DS increased D/D0 glucose compared to group D only at day 7. However, the steroid effect on peritoneal function did not maintain until day 28. Dialysate IL-1β were significantly reduced in steroid-treated groups (CC vs. CCS, D vs. DS, $p<0.05$, respectively) at day 7, but dialysate TNF-α was not different between D and DS. Thickness of submesothelial matrix and number of omental vessels were significantly increased in Group D compared to control. However, they were not different between in Group CC and CCS, whereas tended to be reduced in Group DS compared to Group D.

Conclusions : Peritoneal catheter was related to peritoneal inflammation in an animal PD model. Steroid treatment during early period after catheter insertion did not improve catheter-induced peritoneal changes, although it has minor beneficial effects on the dialysis solution-induced peritoneal changes.

Key Words : 복막투석 도관, 복막 염증, 스테로이드
Peritoneal dialysis catheter, Peritoneal inflammation, Steroid