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자동화 복막 투석 환자에서의 ceftazidime 정맥 주사의 약동학과 복막의 투과 특성과 약동학의 관계

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Pharmacokinetics of Intravenous Ceftazidime in Patients Undergoing Automated Peritoneal Dialysis and Correlation Between Intravenous Pharmacokinetics and Peritoneal Membrane Transport Characteristics

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Background : Ceftazidime is one of the most important antibiotics used to treat peritoneal dialysis (PD)-related peritonitis. The pharmacokinetics of intravenous (IV) ceftazidime was studied in automated peritoneal dialysis patients using pharmacokinetic study method established by Manely et al. In addition, the correlation between peritoneal clearance (CLp) of ceftazidime and 4 hour PET values for dialysate-to-plasma ratio (D/P) creatinine was studied.

Methods : Eleven patients (7 males, median [interquatile] age: 59 [36-62]) were recruited for the study. The patients received single IV dose of ceftazidime (15 mg/kg). Blood and dialysate samples were collected at the beginning, middle, and end of each of 5 dwells during 24 hour. Dwells 1-3 were on-cycler and dwells 4-5 were off-cycler. 24 hour urine samples were collected during the study. One compartment model was assumed to calculate the pharmacokinetic parameters. All patients PET tests were performed within 6 months before or after the pharmacokinetic study. The correlation between CLp and D/P creatinine was calculated using the Spearman product correlation coefficient (ρ)

Results : Ceftazidime serum half-life was 8.72±2.05 hours during on-cycler, 15.87±5.80 hours during off-cycler. The difference was statistically significant ($p<0.05$). Serum and dialysate concentrations of ceftazidime were above minimum inhibitory concentration throughout the 24 hour period in all patients. The correlation between CLp and D/P creatinine was statistically significant with one outlier excluded.

Conclusion : Current recommended IV dose of ceftazidime in CAPD patients (1,000-1,500 mg/day) may also be adequate in APD patients. Peritoneal clearance of ceftazidime may have a significant correlation with peritoneal small solute transport rate.

Key Words : 약동학, 자동화 복막투석, 복막청소율
Pharmacokinetics, APD, Peritoneal clearance