

eP005

ePoster Viewing

PK/PD to improve treatment of critically ill patients

THE EFFECT OF EXTRACORPOREAL MEMBRANE OXYGENATION IN CRITICALLY ILL PATIENTS ON MEROPENEM PHARMACOKINETICS: A MATCHED COHORT STUDY

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Objectives: The scope of ECMO is expanding; however optimal drug prescription during ECMO remains a developing science. Currently, there are no clear guidelines for antibiotic drug dosing during ECMO. The primary objective of this study was to compare pharmacokinetics (PK) of meropenem in ECMO patients with critically ill patients with sepsis not receiving ECMO (controls).

Methods: PK sampling for meropenem was performed in 11 ECMO [venovenous (VV) ECMO, n=6; venoarterial (VA) ECMO, n=5] patients and in 10 non ECMO critically ill controls without renal dysfunction. Meropenem plasma concentrations were determined using validated chromatography. Population PK analysis was performed using non-linear mixed effects modelling.

Results: Five (2 VV, 3 VA) out of 11 ECMO patients received RRT. The other 6 patients (4 VV, 2 VA) had no significant differences in organ function. A two compartment model adequately described the data. ECMO patients had significantly higher volume of distribution (0.53 ± 0.17 vs. 0.32 ± 0.07 , $p < 0.05$) and lower clearance (7.3 ± 5.6 L/h) compared to controls (15.9 ± 6.8 L/h $p < 0.05$). Variability in meropenem clearance was correlated with creatinine clearance or the presence of RRT with patient weight also correlated with V_c . In the ECMO group, a target concentration of > 8 mg/L was maintained in 8/11 patients.

Conclusions: In patients receiving meropenem on ECMO, standard dosing may not result in optimal drug concentrations because of high PK variability. Clinicians need to consider the presence of ECMO as well as renal function or RRT when choosing doses for patients.