Poster

[P25-1] P25-1: Anti-infective drugs (1): Aminoglycosides and beta-lactams

Chair: Andrew McLachlan, Australia

Mon. Sep 25, 2017 12:30 PM - 1:30 PM Annex Hall (1F)

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[P25-1-6] Do prolonged infusions of imipenem protect against the effects of augmented renal clearance and obesity?

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Background

Imipenem is a broad-spectrum antibiotic commonly prescribed in critically ill patients. Since many factors may influence its pharmacokinetics, correct dosing in special populations still remains a challenge. The aim of our study was to compare the population pharmacokinetics and pharmacodynamics of imipenem in critically ill obese (BMI 30) and non-obese (BMI <30) patients and in those with augmented renal clearance (ARC, defined as creatinine clearance 130 ml/min/1.73m2).

Methods

We performed a Monte Carlo simulation using our previously published two-compartment model to generate individual imipenem free serum concentration-time profiles. The simulated population consisted of non-obese and obese subjects and patients with and without ARC. Various dosage regimens (as standard, extended, and continuous infusions) were evaluated against the pharmacodynamic targets of 40% $fT_{>MIC}$ and 100% $fT_{>MIC}$. Cumulative fraction of response (CFR) values were subsequently calculated based on susceptibility data from a national multicentric study (DOI: 10.5507/bp.2016.014) for *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Escherichia coli*.

Results

Both obesity and ARC led to reduced probability of target attainment (PTA) for both 40% $fT_{>MIC}$ and 100% $fT_{>MIC}$ targets. Median CFR values for daily doses of 2 to 4 g were 73.8% (IQR 61 –85%), 23% (IQR 14 –35%), and 75% (IQR 63 –86%) for *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Escherichia coli*, respectively. Administration of an identical dosing regimen by prolonged infusion negated the detrimental effect of obesity and ARC on CFR values, maintaining or even improving them (approximately by 5%) when compared to standard 30minute infusions.

Conclusions

In critically ill patients, extended and continuous infusions provide better PTA and CFR values than standard infusions. The effects of altered pharmacokinetics as a result of obesity and/or ARC can be mitigated by administering of prolonged infusions.

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