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Abstract (oral session)

Meropenem and piperacillin/tazobactam prescribing in critically ill patients: does augmented renal clearance affect pharmacokinetic/pharmacodynamic target attainment when extended infusions are used?

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Introduction: Augmented renal clearance is a frequent finding in critically ill patients and has been associated with low betalactam concentrations. The objective of this study was to assess the influence of renal clearance on pharmacokinetic/pharmacodynamic target attainment in critically ill patients when the antibiotic was administered as an extended infusion. Both the minimum target (50 % fT>MIC), as well as the target of 100% fT>MIC were calculated. Methods: Sixty-one adult critically ill patients without renal dysfunction and treated with meropenem or piperacillin administered as a 3h extended infusion were studied. Twenty-four hour creatinine clearance was measured, a cut-off of 130 ml/min/1.73 m² was used to define augmented renal clearance. A multivariate logistic regression analysis was conducted with target attainment 100 % fT>MIC or 50 % fT>MIC as dependent variable. Results: Forty-five percent of the patients did not achieve 100 % fT>MIC, of which almost 80 % had ARC. Patients who did not achieve the PK target were younger, had a higher weight and a higher creatinine clearance. Multivariate logistic regression demonstrated that a high creatinine clearance was an independent predictor of not achieving the pharmacokinetic/pharmacodynamic target. The mean difference in fT>MIC between the groups with and without augmented renal clearance was 29 % (p<0.001) (figure 1). The area under the ROC-curve for the logistic model with attainment of 100 % fT>MIC as dependent variable was 0.88. Thirteen percent of the patients did not achieve the minimal target of 50 % fT>MIC, even though the drug was administered as an extended infusion, which increases fT>MIC. The area under the ROC-curve for the logistic model with attainment of 50 % fT>MIC as dependent variable was 0.98. Conclusions: A large proportion of critically ill patients without renal dysfunction does not achieve the pharmacokinetic/pharmacodynamic target (irrespective if this is 50% or 100% fT>MIC) even with the use of extended infusion. Most of these patients displayed a creatinine clearance > 130 mL/min/1.73 m²; these patients may be at risk for treatment failure without dose up-titration.

