VANCOMYCIN AND CARBAPENEMS PLASMA MONITORING FOR TARGET ATTAINMENT IN BURN PEDIATRIC PATIENTS (114)

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Introduction: Optimizing antimicrobials prescription is required to improve clinical outcome from infections and to reduce the development of antimicrobial resistance, once it is well known that the pharmacokinetics is altered in burn patients. In addition, in burns critically ill, drug kinetic disposition changes in a different way in adults compared to paediatric patients, and also, few evidences are available on population dosing and dose adjustment requirements in burns. Then, the aim of the present study was to evaluate dose adjustment requirements in burn paediatric patients (21 Pt) receiving systemic vancomycin plus meropenem (8 Pt) or vancomycin plus imipenem (13 Pt) in the Intensive Care Burn Unit (ICBU) for the control of severe infection based on PK/PD correlation.

Methods: 21 patients of both genders (5F/16M) were included, 8.0+/-4.0 yrs (mean+/-SD), 28.8+/-11.4 kg, 40.3+/-18.8% TBSA; lengths in the ICU was 30.8+/-10.6 days. Agent of the accident was fire; inhalation injury occurs in 15/21 and vasoactive drugs were required in 10/21 of them; for clinical outcome 17 discharges against 4 deaths were registered. Normal renal function was registered in all patients during antimicrobial therapy (SCr of 0.32+/-0.23 mg/dL). Fluids and secretions were collected from patients for cultures done in the central laboratory of hospital. Patients were investigated during the antimicrobial follow up in 21 patients (49 sets of drug plasma levels). Drug plasma measurements were obtained by HPLC-UV after blood collection (2mL/each). PK/PD correlation was performed (GraphPad Prisma 5.0) and drug effectiveness was based on indices recommended: AUCss_0-24/MIC >400 for vancomycin and 40%T>MIC for carbapenems, once the MIC is the minimum inhibitory concentration, for each isolated pathogen.

Results: Vancomycin target attainment was reached for the empiric dose regimen at daily dose 55-70 mg/kg, (IC95%) against pathogens MIC 0.5-1mg/L; while, daily dose required for drug effectiveness must be increased (80-125 mg/kg) in 39/49 plasma sets against MIC>1mg/L pathogens, Figure 1. In addition, dose adjustment for drug effectiveness/safety required for carbapenems were 34%/28% (meropenem) and 25%/15% (imipenem) based on differences on PK, Figure 2.

Conclusion: Drug effectiveness and safety was guaranteed for the control of sepsis in critically ill burn paediatric patients by dose adjustment based on PK/PD correlation, and justified by differences on pharmacokinetics and on pharmacodynamics considering pathogens isolated.
Fig. 1. Dose adjustment required for drug effectiveness-safety in paediatric burns

Fig. 2. Target attainment in paediatric burns by PK/PD Correlation for the Control of Sepsis

Figure 1

Figure 2

Key-words: drug plasma monitoring, predictive index, PK/PD correlation, effectiveness-safety

Acknowledgments: Foundation for Research State of Sao Paulo/SP, Brazil - FAPESP