Meropenem effectiveness in critically burn patients at the earlier versus the late period of septic shock by pharmacokinetics assessment based on drug serum measurements done in a real time

1Clinical Pharmacokinetics Center, School of Pharmaceutical Sciences,SP-RP
2Division of Plastic Surgery and Burns HCFMUSP. University of São Paulo, São Paulo, SP –Brazil

Physiological changes that occur mainly during the septic shock in burn patients can alter pharmacokinetics (PK) of beta-lactam agents that can impact the desired outcome in ICU patients undergoing meropenem therapy.

Subject

The aim of the study was to investigate PK changes for meropenem at the earlier versus late period of septic shock in burn patients receiving the recommended dose by extended infusion.

Casuistry and Methods

• 15 ICU burn patients 5M/10F fire or high voltage injuries

Characteristics of patients admission in ICU

• Age 37 yrs, medians
• Body weight 71 kg
• Total burn surface area 33%
• Inhalation injury and vasopressor 12/15
• SAPS3’s score of 54

Septic burn patients undergoing Meropenem therapy

• Clcr 100 mL/min
• PCR 85 mg/L
• WBC 15,99 mil cel/mm³

Blood sampling for drug serum measurements

Dose regimen 1g q8h extended 3 hr infusion
Blood sampling 1.5mL/each at steady state level
1 st sampe- Zero hr immediately before the next infusion
2 nd sample-3rd hr of starting of drug infusion
3 nd sample- 5th hrs of starting of drug infusion

Bioanalytical Method – Liquid Chromatography (HPLC)

Santos et al. Rev Port Farmacoterapia (2011)

Conclusion

Target attainment in burn patients was impacted by meropenem PK changes that occurred only at the earlier period of septic shock.

Desired outcome was reached by clinical cure for all patients included in study against Gram-negative pathogens up to MIC 4mg/L, intermediate susceptibility K. pneumoniae and P. aeruginosa.

Finally, PK/PD approach based on drug serum monitoring done in real time is an important tool to assess drug effectiveness in ICU burn patients.