

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



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Introduction

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 área **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 sample- 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)

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Results

Figure 1- Meropenem target attainment during the septic shock

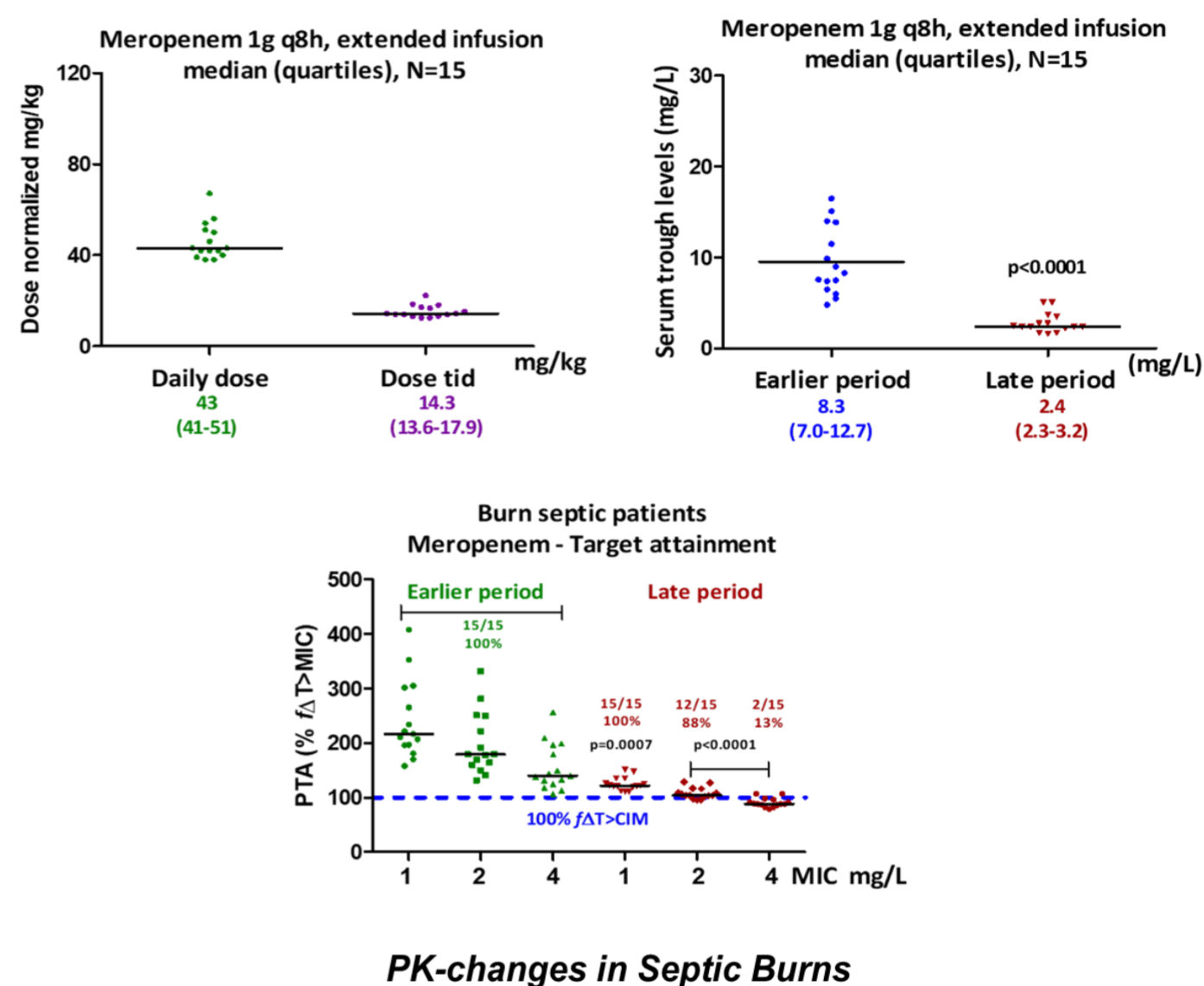
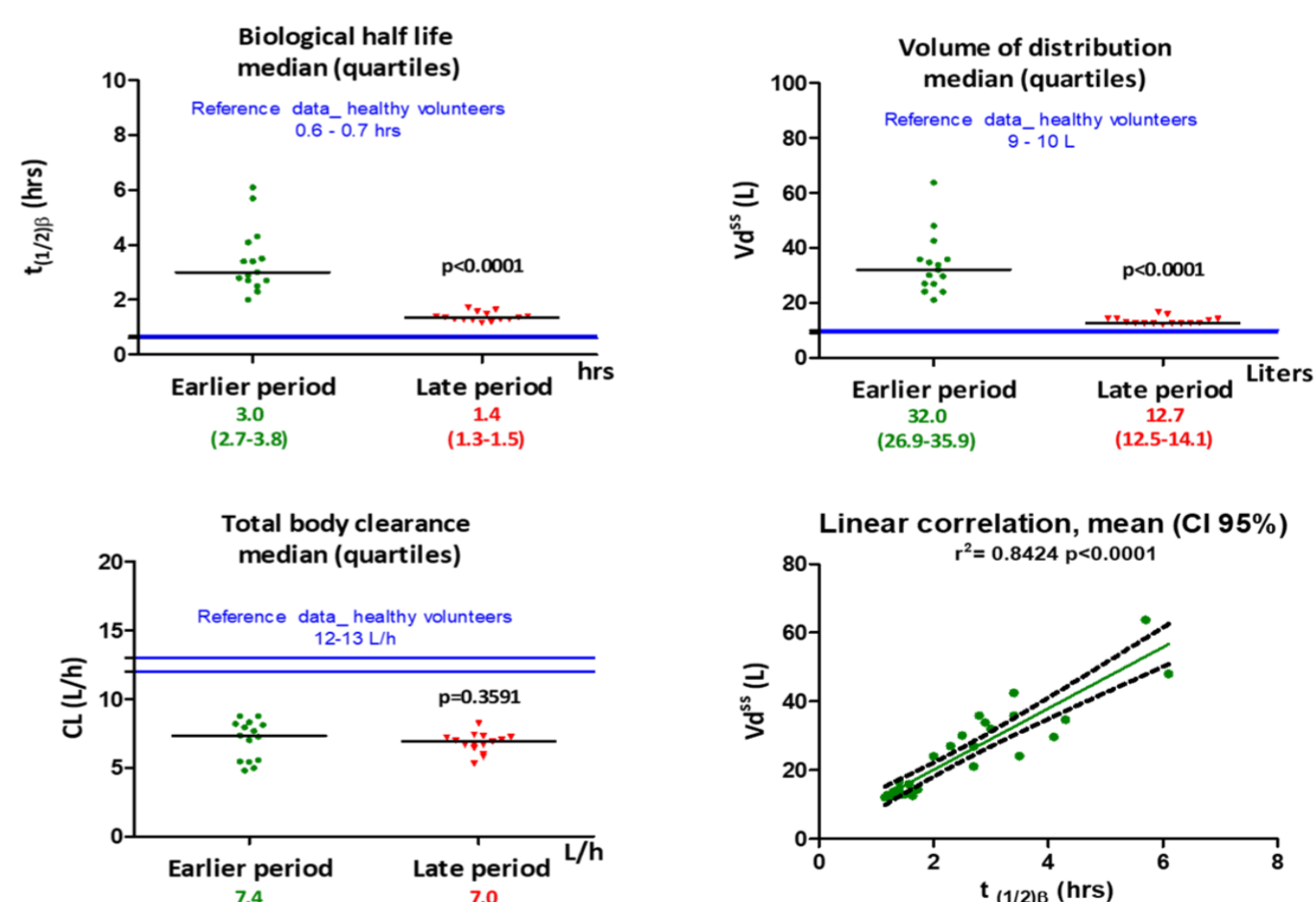


Figure 2 Different PK changes occurs during the septic shock



Ref. Jaruratanasirikul JAC ,518-521 (2003)- healthy volunteers PK data

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**.