

# Meropenem pharmacokinetics changes during the course septic shock with impact on coverage based on PK/PD approach in critically burn patients

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**Introduction:** Physiological change that occurs during the time course septic shock in septic patients alters pharmacokinetics (PK), which could impact the desired outcome in ICU patients undergoing meropenem therapy [1].

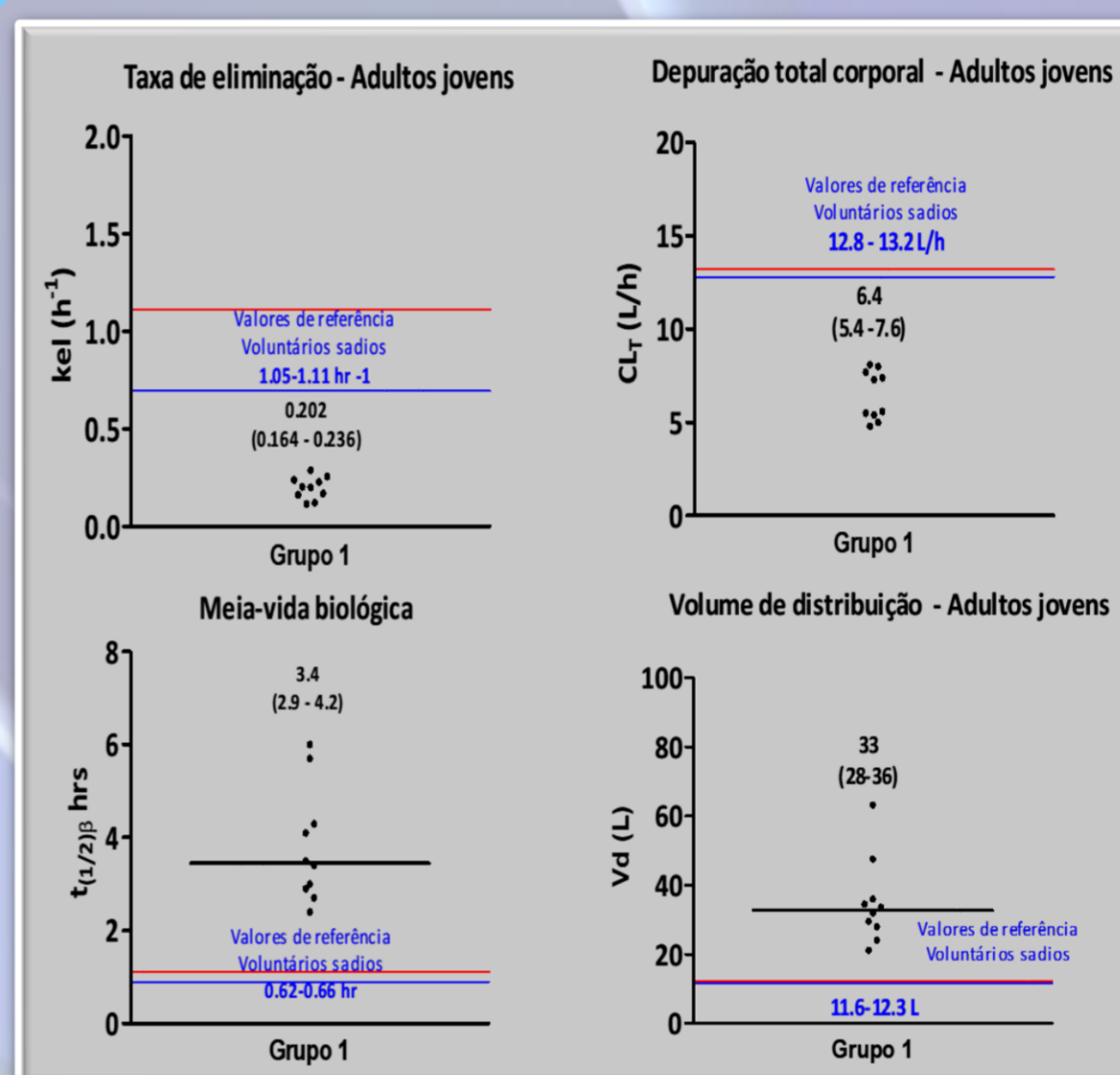
**Objective:** Rational of study was to evaluate the meropenem effectiveness in burned patients, based on pharmacokinetic-pharmacodynamic (PK/PD) approach by comparison of early *versus* late stage of septic shock.

## Methods:

- ✓ **Casuistry** 10 critically ill burned patients (7M/3F) preserved renal function: 37 yrs, 75 kg, TBSA 34%, SAPS-3 53, medians. Inhalation injury-mechanical ventilation occurred in 8/10, and vasopressors required in 8/10
- ✓ **Cultures:** collected before antimicrobial therapy starts
- ✓ Initial dose 15 mg/Kg q8h, 3 hrs extended infusion
- ✓ **Meropenem therapy:** dose regimen 1g q8h, 3hrs-infusion
- ✓ **Blood sampling** (1,5 mL /each of therapy started: D2, D9, D14) **Set 1 (D2), Set 2 (D9), Set 3 (D14): 3<sup>rd</sup> - 5<sup>th</sup> hrs of infusion started**
- ✓ **Drug serum measurements:** liquid cromatography
- ✓ **PK:** data estimated (Noncompartmental data analysis)
- ✓ Patients PK-data compared with healthy volunteers [3]
- ✓ **PK/PD approach:** based on serum levels and MIC data
- ✓ **Predictive index of drug effectiveness was %f $\Delta$ T>MIC**
- ✓ **Target of 100%f $\Delta$ T>MIC was considered.**

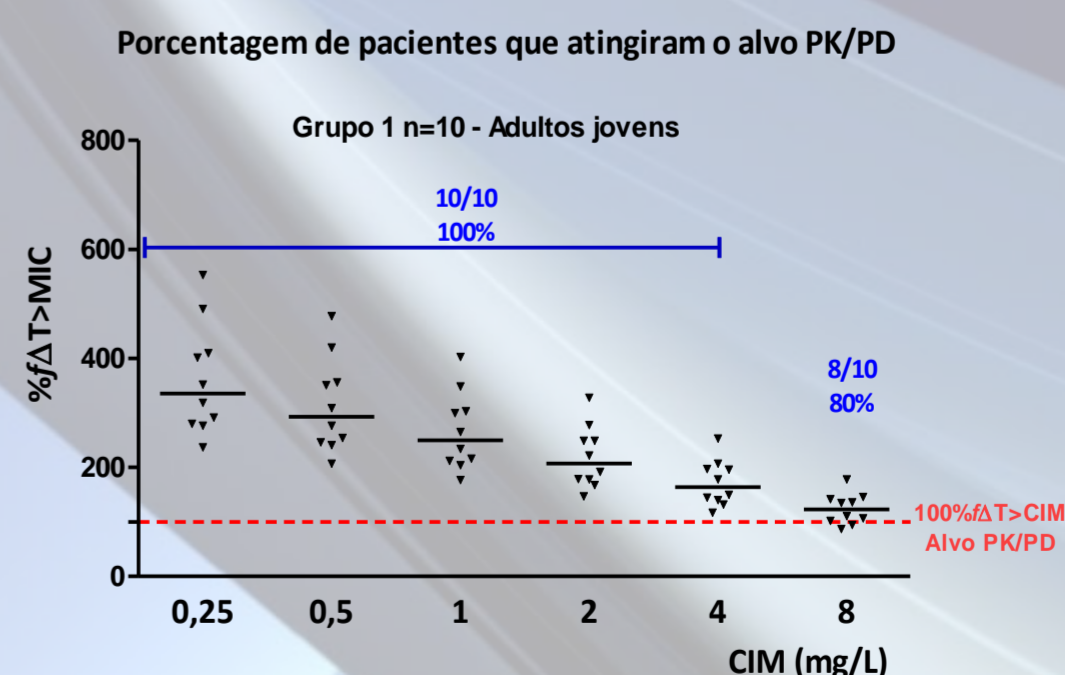
## RESULTS PK-DATA

Prolongation of biological Half life as a consequence of Volume of distribution increased



## RESULTS PK/PD Approach

Therapeutic Target was attained up to MIC 8 mg/L strains  
EARLY Stage Sets 1-2 for all patients \_LATE Stage Set 3 for 8/10 patients



## ➤ Conclusion

- Meropenem 1g q8h, 3hrs infusion must be prescribed to Burned patients at onset of septic shock.
- It was shown that drug effectiveness was guaranteed up to 12 days of therapy by applying the tool of PK/PD approach to avoid bacterial resistance.