

# Meropenem extended infusion in burn patients for drug effectiveness at the earlier period of septic shock against Gram-negative nosocomial MIC 4 mg/L strains

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## Introduction

Meropenem administered by intermittent infusion usually cannot achieve the target in critically ill septic patients from Intensive Care Unit (ICU) against the most common MIC>2 mg/L Gram-negative strains that can impact the desired outcome [1].

## Objective

Rational of study was to investigate meropenem effectiveness in burn patients receiving the empirical dose regimen by extended 3hrs-infusion based on PK/PD approach against nosocomial susceptible and intermediate susceptibility Gram-negative strains.

## Methods

Ethical approval was obtained, and consent form was signed by each patient's responsible included.

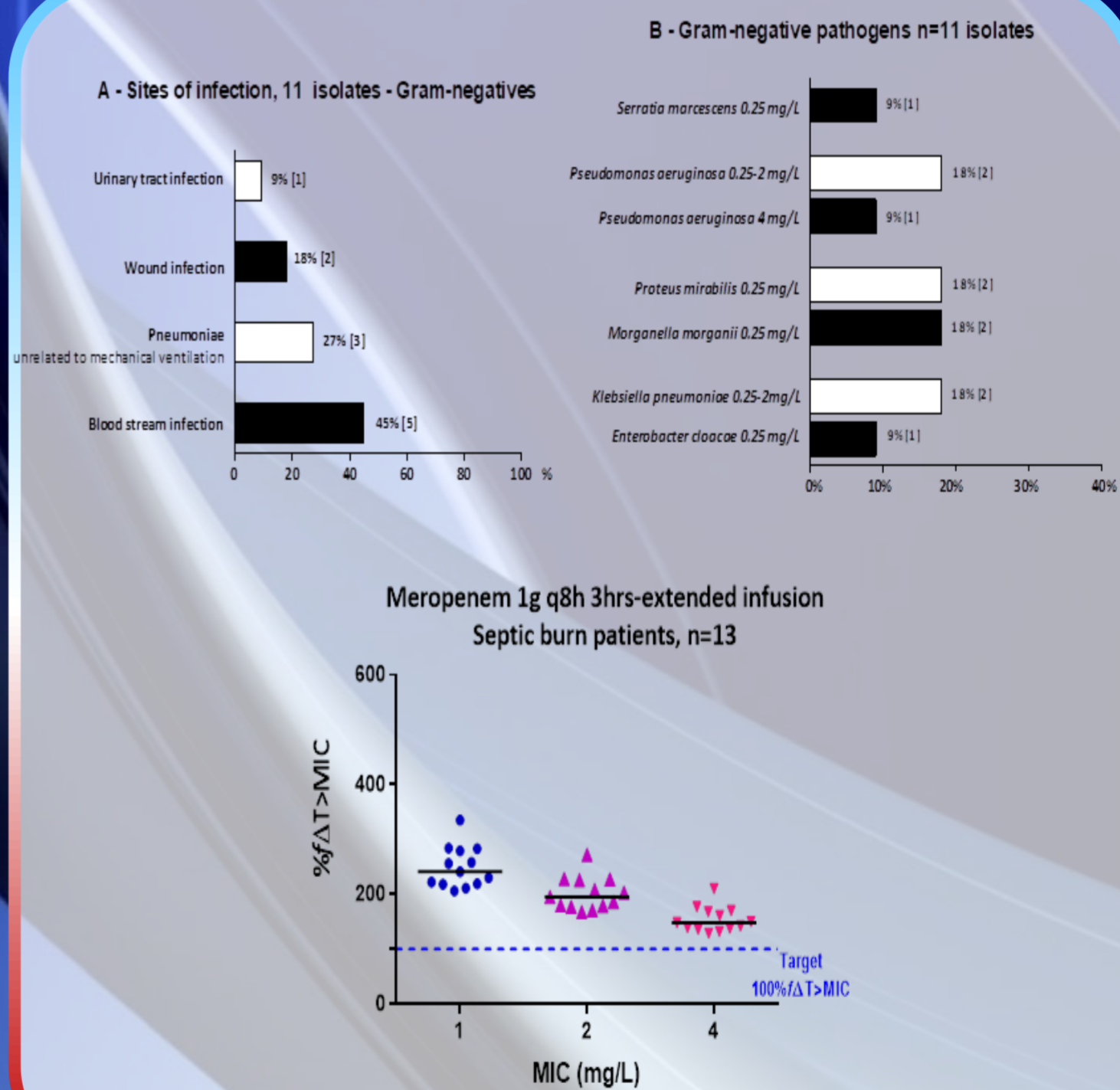
13 adult burned patients with renal function preserved

- Cultures were collected before start antimicrobial therapy
- Patients undergoing meropenem therapy at the early stage of septic shock received 1g q8h by 3 hrs-infusion
- Blood sampling for serum measurements: at the steady state 3rd and 5th hrs of start meropenem infusion, done by LC-UV [2].
- Pharmacokinetics (PK): noncompartmental data analysis: PK-data of septic patients compared with healthy volunteers [3].
- PK/PD approach: target attainment (PTA) based on the predictive index of drug efficacy ( $\%f\Delta T > MIC$ ) for the therapeutic target,  $100\%f\Delta T > MIC$ , considered [4].

**References:** [1] Gonçalves-Pereira *et al.* (2014). [2] Santos *et al.* (2011). [3] Jarurataririkul *et al.* (2003). [4] Abdul-Aziz *et al.* (2016)

## Results

- Characteristics of patients at ICU admission were: 27 yrs, 70 kg, 34% total burn surface area, SAPS3 58, medians. Inhalation injury and orotracheal intubation occurred, 8/13. *SAPS Simplified Acute Physiology Score*
- Serum trough levels and target was attained for all patients by eradication of nosocomial pathogens up to MIC 4 mg/L and extended in (6/13) patients against intermediate susceptible strains MIC 8mg/L.
- PK-changes that impact drug effectiveness was shown.
- Total isolates were stratified in *Enterobacteriaceae* and *Pseudomonas aeruginosa*, a *Non Enterobacteriaceae* of high incidence in ICU patients.



## Conclusion

- Meropenem serum level is altered at the earlier period of septic shock in burn patients with impact on drug distribution, and consequently in drug effectiveness.
- Desired outcome was reached, and the clinical cure occurred for all patients against MIC 4 mg/L. Coverage of meropenem against MIC 8mg/L strains was reached in 6/13 patients.
- PK/PD approach done in a real time is an important tool based on drug serum monitoring must done soon to eradicate Gram-negative pathogens with cure of infections, and also to avoid the microbial resistance.