

Vancomycin dose adjustment in critically ill burn patients by pharmacokinetic-pharmacodynamic (PK/PD) approach against Gram-positive MIC 2 mg/L strains

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Introduction

Vancomycin empiric dose recommended usually cannot reach the target in critically ill septic patients from the Intensive Care Unit (ICU) against the most common MIC > 1 mg/L strains that can impact the desired outcome.

Objective

Aim of study was to compare vancomycin 2g with 3g daily based on pharmacokinetic-pharmacodynamic (PK/PD) approach in ICU burn patients with renal function preserved.

Casuistry and Methods

Ethics

Consent form was signed by the legal responsible of each patient included.

Vancomycin Therapy

10 Adult burn septic patients (1F/9M)
 Before the antimicrobial therapy starts, cultures were collected from fluids, secretion from each patient
 Set 1 - 1g q12h followed by Set 2 1g q8h 1 hr infusion

Blood sampling for TDM

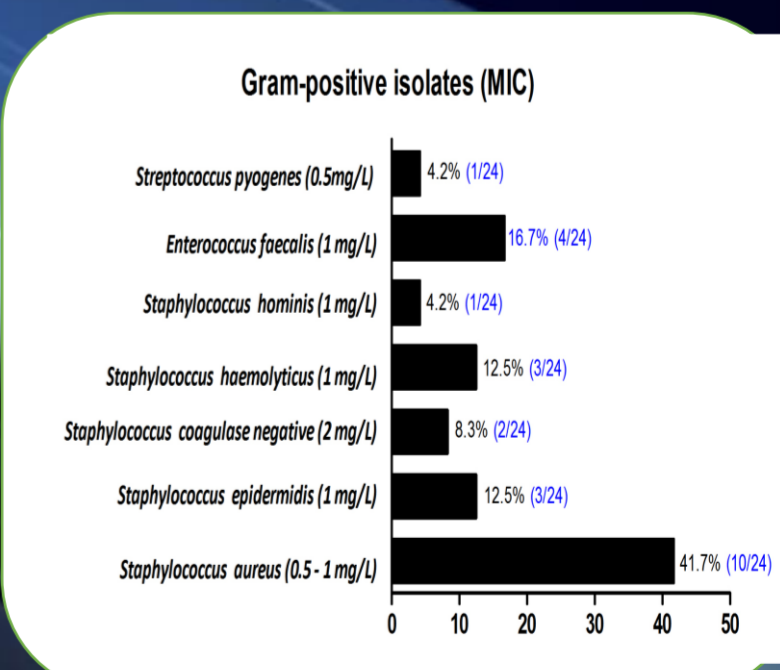
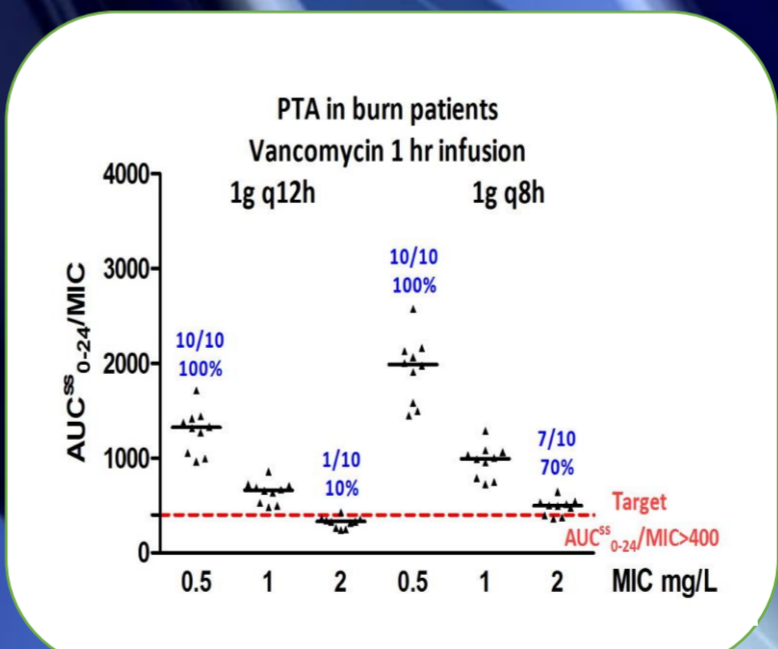
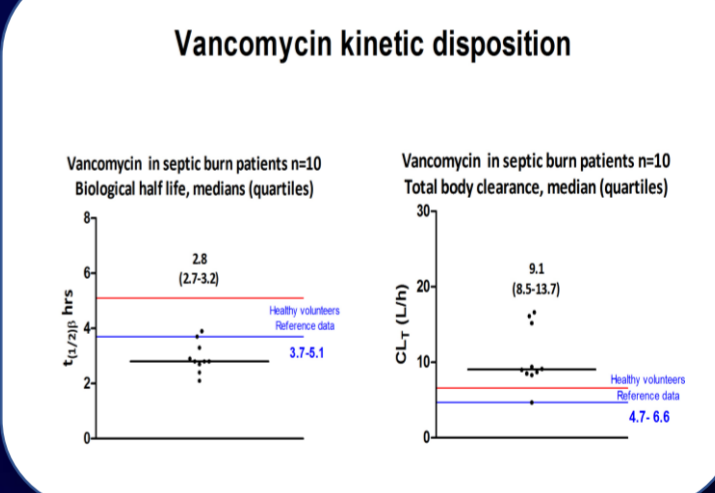
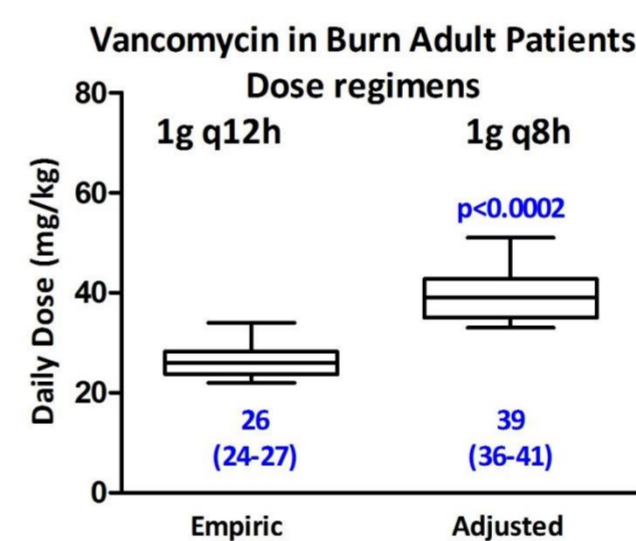
Collected at 3rd and 11th hr of starts infusion (1.5 mL/each) for drug serum measurement by liquid chromatography.

PK-data burn patients *versus* healthy volunteers [1].

PK/PD approach to estimate the probability of target attainment (PTA) based on the predictive index of drug effectiveness (AUC/MIC ratio) for the target considered $AUC_{0-24}^{ss}/MIC > 400$ [2].

Results

- Age 25 yrs, BW 78 kg, TBSA 29%, SAPS3 63
- Inhalation injury, MV (8/10); vasopressor 10/10
- Significant difference ($p < 0.0002$) between doses empirical *versus* adjusted regimens
- PK-changes were described, and a high variability was obtained in septic burn patients
- Target was reached up to MIC 2 mg/mL strains after dose adjustment (7/10) patients
- Total isolates: 24 gram-positive were described



Conclusion

- Vancomycin PK changes impact the target attained based in AUC/MIC ratio. Since PK-changes in burned patients in unpredictable during the time course of septic shock, the individualization of dose therapy must be done soon by PK/PD approach to reach the desired outcome with cure of infections against MIC 2 mg/L Gram-positives nosocomial pathogens.