

# IMIPENEM SERUM MEASUREMENTS IN A REAL TIME FOR TARGET ATTAINMENT AGAINST MORE AGGRESSIVE STRAINS MIC>2MG/L IN SEPTIC BURNS

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## Background:

Unpredictable pharmacokinetics (PK) in burn patients may result in serum concentrations below those effective against the most common gram-negative pathogens. Then, the objective of the present study was to evaluate drug effectiveness in adult burn patients from the Intensive Care Burn Unit (ICBU) receiving imipenem for the control of septic shock based on PK/PD correlation. Also, dose adjustment requirements according to renal dysfunction were investigated in these critically ill.

## Material/methods:

Serum drug monitoring, PK study and PK/PD correlation were performed after a serial of blood sampling collection, free drug serum measurements was quantified by liquid chromatography. Probability of target attainment (PTA) was based on PD target of 40% free drug serum concentrations above the minimum inhibitory concentration (40%fT>MIC). Imipenem pharmacokinetic data were stratified based on renal function

## Results:

Thirty six burn patients, 73 sets of plasma levels

- 35.2 years of age (mean),
- 68.0 kg,
- 37.9% total burn surface area (TBSA),
- 84% (43/51) exhibited thermal injury,
- 25/31 inhalation injury and
- 5/31 electrical injury.
- Time after accident of patients in the ICBU was 21.8+/-11.5 days, mean/SD.

Significant differences in PK parameters were registered in burns via comparisons of TBSA.

Target was attained after dose adjustment for all patients for MICs below 2 mg/L.

Parameter	TBSA%		p-Value
	<39.9% (n=32)	>40% (n=41)	
$t_{(1/2)\beta}$ (h)	1.8 (1.5-2.2)	2.9 (1.9-4.5)	0.002*
$CL_T$ (L/h)	18.4 (15.5-22.5)	14.9 (12.6-18.9)	0.009*
$Vd^{ss}$ (L/kg)	0.65 (0.50-1.05)	0.97 (0.77-1.22)	0.135*
Daily Dose (mg/kg)	28.6 (26.7-29.5)	28.6 (28.6-33.3)	0.118*
Target Attainment (MIC: 4mg/L)	30	35	0.453**

**Statistics:** \*Mann-Whitney test for PK and Daily Dose and \*\*Chi-Square for target attainment. Data expressed as quartiles (median / IQ 25-75%) and frequency for Target attainment.

**Abbreviations:** TBSA: total burn surface area;  $t_{(1/2)\beta}$ : biological half-life;  $CL_T$ : total plasma clearance;  $Vd^{ss}$ : apparent volume of distribution at steady state.

On the other hand, for MICs of 4 mg/L target was reached in 89% (65/73) of sets and no difference was obtained for target attainment according TBSA.

**Conclusions:** PTA was reached against *Citrobacter freundii*; *Haemophilus influenzae*; *Serratia marcescens* (CIM 2mg/L), while considering the most aggressive pathogens like *Enterococcus faecalis*, *E. faecium*, *Morganella morganii*, *Proteus mirabilis*, *P.vulgaris*, *Providencia stuarti*; *Pseudomonas aeruginosa*, *P. fluorescens*, dose adjustment were required.

