

# COMPARISON OF TWO PHARMACOKINETIC/PHARMACODYNAMIC INDICES IN CRITICALLY ILL PATIENTS TREATED WITH AMIKACIN

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## BACKGROUND AND IMPORTANCE

J01- ANTIBACTERIALS FOR SYSTEMIC USE

**Amikacin** is commonly used as an **empirical treatment** for Gram-negative infections in **intensive care unit (ICU)** patients. The **pharmacokinetic/pharmacodynamic (PK/PD) index** commonly used is the **ratio maximal concentration:minimum inhibitory concentration (C<sub>max</sub>/MIC)** and, to a lesser extent, the **ratio area under the curve from 0 to 24h:MIC (AUC<sub>0-24</sub>/MIC)**

## AIM AND OBJECTIVES

To **evaluate** the PK/PD indices **C<sub>max</sub>/MIC** and **AUC<sub>0-24</sub>/CMI** for amikacin in critically ill patients.

## MATERIAL AND METHODS



Patients admitted to a **medical ICU** with **preserved renal function** (CKD-EPI > 60 ml/min) treated with **empirical amikacin once-daily** were included



**Therapeutic Drug Monitoring** was carried out **after the first dose** (C<sub>max</sub> and C<sub>post-8h</sub>, at 30 minutes and 8 hours respectively, after a 30-minute infusion)



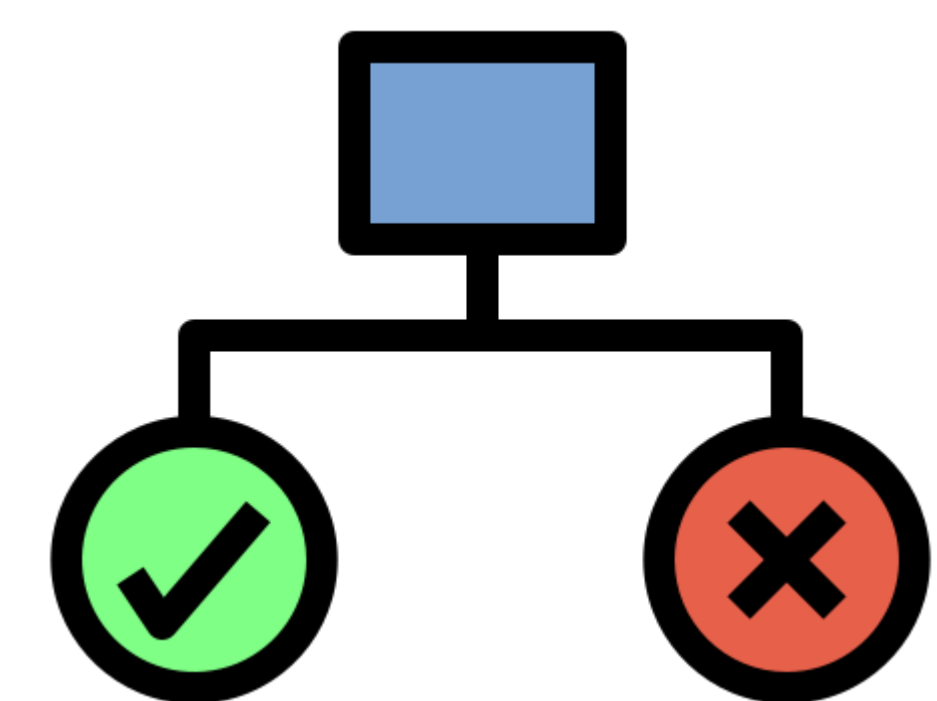
**Bayesian estimates** were performed using **PKS<sup>®</sup> software** with a single compartment pharmacokinetic model



**Targets for PK/PD C<sub>max</sub>/MIC and AUC<sub>0-24</sub>/MIC were 8-10 and 80, respectively.** An **empirical MIC of 4 mg/L** was established for the calculation

Parametric AUC calculation was performed by empirical Bayesian estimation of pharmacokinetic

Patients were classified according to those who **reached the target or not for both indices** (C<sub>max</sub>/MIC and AUC<sub>0-24</sub>/MIC)



## RESULTS

**N=48** Results expressed as median and percentile 25-75

Age	63 years
Weight	83 kg
Creatinine	0.6 mg/dL

C <sub>max</sub> (mg/L)	48.3 (45.9-50.9)
C <sub>min</sub> (mg/L)	0.19 (0.03-0.61)
AUC (mg·h/L)	235 (191-271)
C <sub>max</sub> /MIC	12.1 (11.5-12.7)
AUC <sub>0-24</sub> /MIC	58.7 (47.7-67.9)

	Starting	After TDM	
Total dose (mg)	1225 (1000-1500)	1250 (1200-1500)	p=0.33
Dose adjusted for total weight (mg/kg)	14.7 (11.8-18.3)	14.7 (12.5-17.1)	
Dose adjusted for ideal weight (mg/kg)	19 (15.3-22.8)	19 (17.6-22.2)	

**100% of patients reached** the therapeutic objective according to the **C<sub>max</sub>/MIC index**, although the percentage was **reduced to 17%** when the PK/PD index of efficacy was **AUC<sub>0-24</sub>/MIC ratio** (p ≤ 0.05)  
To achieve the AUC<sub>0-24</sub>/MIC target, the required dose was estimated to be **1760 mg (1300-2270)** (p ≤ 0.05)

## CONCLUSION AND RELEVANCE

**No correlation** between the PK/PD C<sub>max</sub>/CMI and AUC<sub>0-24</sub>/MIC indices **was observed.**  
**To achieve the AUC<sub>0-24</sub>/MIC target, a significant dose increase is necessary** compared to the doses required for C<sub>max</sub>/MIC.

