PHARMACOKINETIC MONITORING AND CHARACTERIZATION OF LINEZOLID IN HOSPITALIZED PATIENTS

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BACKGROUND AND OBJECTIVES

- Linezolid has a narrow therapeutic window. Low exposure reduces efficacy and high exposure increases haematological toxicity. Standard dosing shows high interindividual variability, making TDM essential..
- Aim /Objectives: To assess **linezolid pharmacokinetics**, **variability** and the impact of **monitoring on dose adjustment** and **haematological safety.**

MATERIAL AND METHODS

DESIGN

Observational, descriptive and retrospective study.
Included: all adult patients treated with linezolid between June 2023 - February 2025 at a tertiary hospital.

Therapeutic Interval (TI): 2-10 µg/mL

DATA COLLECTED

- Sex, age, height, weight.
- Creatinine (Cr), creatinine clearance (ClCr).
- Treatment indication (empirical/targeted).
- Route of administration, initial dosage.
- Linezolid trough plasma concentration and population variables of the sample.

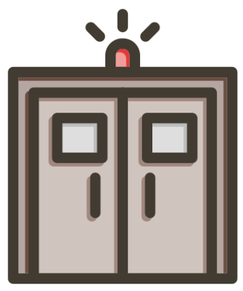
Pharmacokinetic analysis: one-compartment model using Bayesian fitting with PKS® obtaining:
Volume of distribution (Vd), clearance (Cl) and elimination constant (Ke)

RESULTS

29 patients

75,8% - ♂
55 (±15) years
78,3 (±16,8) Kg
172,5 (±7,9) cm

Cr =1.19 (±1,34) mg/dL
ClCr = 54,7 (± 3,7) mL/min.



86% - Admission to Intensive Care Unit
100% - IV administration
59% - Empirical therapy, remainder targeted

Initial dosage:
79,3% - 600 mg/12h
13,7% - 600 mg/8h
6,9% - 600 mg/24h

Estimated pharmacokinetic parameters
Mean Vd of 30.38 (±3.69) L/70 Kg,
Total Cl of 2.61 (±0.30) L/h/70 Kg
Ke of 0.084 h^{-1}.

Linezolid concentrations in plasma → 3,55 (±4,28) µg/mL.

Levels	% of patients	Concentration
Within the TI	62,1%	4,85 (± 2,65) µg/mL
Infratherapeutic	31%	0,87 (± 0,51) µg/mL
Supratherapeutic	6,9%	13,25 (±0,3) µg/mL.

Recommendations
65,5% → maintain same dosage
27,6% → increase by 600mg/8h
6,9 → decrease by 600mg/24h

Dose adjustments were recommended in 34.5% of cases, achieving optimal concentrations in **82.7%** after modification.

CONCLUSION AND RELEVANCE

- ✓ The pharmacokinetics of linezolid exhibit **high interindividual variability**, with subtherapeutic concentrations observed in a significant percentage of patients.
- ✓ Pharmacokinetic monitoring allows for **individualized dosing** to maintain concentrations within the therapeutic range, **maximizing effectiveness and reducing the risk of toxicity.**