

Achievement of vancomycin AUC targets: a study in elderly patients



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Introduction

Therapeutic Drug Monitoring (TDM) and **dose adjustment of vancomycin** has been traditionally based on **trough concentrations (C_{min})**, but recent data suggest that **Area under the concentration-time curve (AUC)** should be used to **guide vancomycin dosing**, with target values: **400-700 mg.h/L** ^{1,2}

Objectives :

- Report the **proportion** of patients **achieving the AUC targets**,
- Examine the **agreement** between **C_{min} and AUC target** attainment and identify **determinants of AUC target** attainment

Material and methods

- Study: **retrospective analysis of vancomycin TDM data in elderly patients**
- Data collected: **from 2015 to 2017**
- Bayesian analysis of vancomycin concentration with BestDose™ (<http://www.lapk.org/>)
- Pharmacokinetic analysis:**
 - Estimation of **vancomycin pharmacokinetic (PK) parameters**
 - Estimation of **AUC over the third day of therapy (48-72h)** based on measured concentrations
- Statistical **tests:**
 - Proportion of patients achieving **AUC values ≥ 400 and ≤ 700 mg.h/L**
 - Agreement** between **AUC and C_{min} target** attainment
 - Characteristics of patients** who achieved and did not achieved the AUC targets

Results

Pharmacokinetic analysis:

Patients' characteristics:

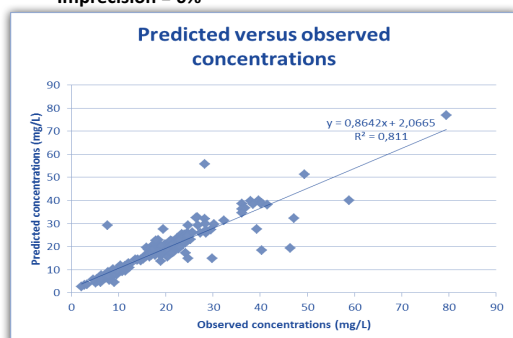
	Mean	Min	Max
Nb of patients	69	-	-
Age (years)	82	54	94
Sex/ratio (H/F)	0,58		
Body weight (Kg)	66,4	38	101
Creatinine Clearance (ml/min)	58	17	112
AUC over the third day of therapy (48-72h):	509	160	1155

AUC over the third day of therapy (48-72h):

- Mean AUC : **509 ± 211 mg.h/L**

Good predictive performance of the vancomycin model in BestDose™:

- Bias = **2.3 mg/L**
- Imprecision = **6%**



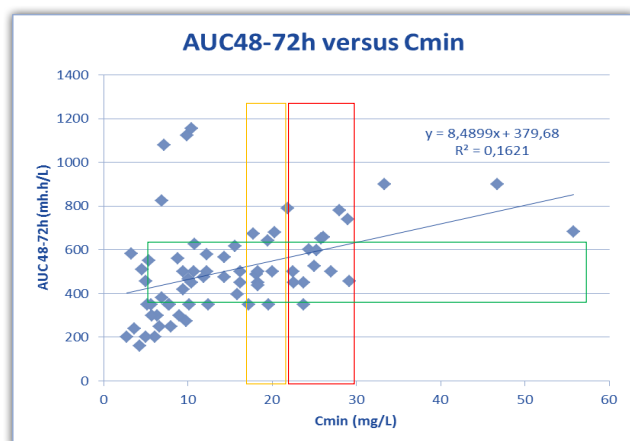
Statistics tests:

Proportion of patients achieving:

- AUC values ≥ 400: 68% (47/69)**
 - ✓ **AUC values ≥ 400 and C_{min} < 15 mg/L: 42% (20/47)**
- AUC values ≥ 700: 13% (9/69)**

Agreement between AUC and C_{min} target attainment:

- Patients achieving the efficacy AUC target received a **larger dose per administration** than those who did not (15.1 versus 13.4 mg/kg, p = 0.008)
- Association** between the **dose** and an **AUC value over 700 mg.h/L** (17.6 versus 14.1 mg/kg p = 0.033)



Discussion/conclusion

In this study:

- 32%** of elderly patients did **not achieve the AUC target of 400 mg.h/L after 72h** of therapy
- 13%** were **overexposed**
- Therapeutic AUC** of vancomycin may be **associated** with **trough concentrations considered as insufficient**

Bibliography

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