TDM of glycopeptides: from preanalytical recommendations to pharmacoeconomic impact



Notion of target concentrations

Reasons for TDM

- Low therapeutic index drugs
- better relationship between blood levels/effects than between doses/effects
- overcome the fear of toxicity
- pharmacodynamic resp. difficult to quantify
- non linear PK drugs
- unstable clearance
- toxicity confounded with pathological status
- compliance
- cost effectiveness Pr P Wallemacq, UCL-Cliniques Univ St Luc





Preanalytical aspects

- Xenobiotic agents ⇒ time dependent concentrations
 - importance of time of blood drawing (trough level)
 - distribution phase
 - caution for iv dosing and sampling contaminations
- choice of the sampling container
 - avoid separator gel (non specific adsorption eg tricyclic AD, amiodarone...)
- type of anticoagulant, volume, storage, dosing & clinical informations...

TDM of glycopeptides. Practical aspects

- blood drawing on dry tubes or EDTA
 - before perfusion (trough)
 - 2h (peak) vancomycine
- avoid iv contaminations
- mention of drawing time, start/end of infusion
- indicate the dose and interval
- age, height, weight, creatinine, pathologies...
- immunassays and TDM-PK software program

Target concentrations

- Vancomycine:
 - trough: 5-10µg/mL
 - peak extrapolated at T0: 25-35 µg/mL
 - continuous infusion: 15-20 μ g/mL (?)
- teicoplanine:
 - trough: 15-20 μg/mL (?)
 - peak: 40-50 μg/mL (?)
 - need for TDM ?

Evaluation of the total vancomycin dose reduction caused by TDM

Mean duration 21 days	Initial scheme	Scheme advised by TDM-PK
Mean ±sd tot dose (g)	39.1±20	24.6±16.2
P		< 0.001

Determined on 48 adult patients under vancomycin with target peak conc 25-35µg/mL and trough conc 5-10µg/mL

Effect of age on the nephrotoxicity risk of vancomycine 1.

- Data base of 11471 files vanco (St Luc)
- exclusion criteria:
 - error or suspicion in the blood drawing
 - renal insuf (ser creat. >2.5 mg/dL)
 - child < 6 yr, and adults between 40 et 65 yr
- selection criteria (n = 111):
 - complete files: peak conc., trough levels, creatinine, body weight...
 - trough > 10 μ g/mL min. 4 days (nl range: 5-10 μ g/mL) Pr P Wallemacq, UCL-Cliniques Univ St Luc 8







- TDM should never be considered as a single analytical determination
- TDM appears beneficial when accompanied by a good PK analysis
- TDM should help overcoming the fear for toxicity resulting to a more active treatment
- properly performed it contributes significantly to a total cost reduction