This is the first study examining the pharmacokinetic/pharmacodynamic implications of using the sc route for teicoplanin” Cazaubon et al (2017).

Abstract:

Objectives: To investigate the population pharmacokinetics of teicoplanin in patients treated by the subcutaneous (sc) and/or intravenous (iv) route.

Patients and methods: Non-linear mixed-effects modelling described teicoplanin concentrations from 98 patients with infection caused by Gram-positive cocci. Monte Carlo simulations were performed to evaluate the probability of target attainment (PTA) of various
dosage regimens.

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Results: Teicoplanin concentrations were best described by a two-compartment model with clearance predicted by estimated glomerular filtration rate. Estimated absorption rate constant (between-subject variability) was 0.039 h–1 (77%), clearance was 0.305 L/h (28%), central volume was 10.3 L (49%), inter-compartmental clearance was 4.42 L/h (66%) and peripheral volume was 97.4 L (51%). The sc route was associated with lower initial Cmin and AUC (day 3: loading phase) compared with the iv route. This difference appeared to vanish after 14 days, with comparable simulated PTAs based on the Cmin and AUC for all tested dosages (400, 600, 800 and 1000 mg every 12 h). However, a loading dose regimen with five administrations of either 400 or 600 mg was not sufficient to achieve the target Cmin (≥15 mg/L) for both routes. Also, PTAs for higher MIC (≥1.0 mg/L) were poor with all regimens for both routes.

Conclusions: This is the first study examining the pharmacokinetic/pharmacodynamic implications of using the sc route for teicoplanin. Subcutaneous administration is associated with lower Cmin and AUC values after the loading phase compared with iv administration. Therefore, iv administration should be preferred in the first few days of therapy. This study also shows that loading doses of teicoplanin higher than currently recommended should be used to improve PTA.

Reference:

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