A multicentre survey of vancomycin therapeutic drug monitoring practice in Austria and Germany

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Background. Vancomycin constitutes a key drug in anti-MRSA antibiotic therapy. Despite its frequent use, accurate dosing remains challenging due to its nephrotoxic potential and high interpatient pharmacokinetic variability. In an effort to optimize clinical efficacy while improving patient safety, new vancomycin consensus guidelines recommend a shift towards AUC-guided dosing and therapeutic drug monitoring (TDM) using Bayesian software programs. This survey aimed to assess the status-quo clinical practices of vancomycin dosing and TDM in Austria and Germany, including the potential for implementing model-based precision dosing.

Methods. An online structured and anonymized questionnaire was developed in partnership with the Paul-Ehrlich-Society for Chemotherapy and the Federal Association of German Hospital Pharmacists (ADKA) and distributed among hospital pharmacists and members of the Austrian Society for Infectious Diseases and Tropical Medicine (ÖGIT) in early 2020. Data sought included strategies and rationales for initial and maintenance dosing, pharmacokinetic/pharmacodynamic targets and TDM practices.

Results. A total of 89 healthcare professionals (60% Germany) responded, including mainly pharmacists (73%). Vancomycin was administered predominantly as intermittent infusion (II; continuous infusion CI: <50% of hospitals). Stated targets ranged from 10-30 mg/L (CI/steady-state), 5-30 mg/L (II/trough), 15-55 mg/L (II/peak) and 400-600 mg·h/L (II/AUC; response rate 7%). Vancomycin was commonly subject to TDM (Germany/Austria: 89%/73%), with trough concentrations representing the most frequently used target (Germany/Austria: 92%/79%). Five participants (6%) used AUC as the basis for dose verifications. Main reasons for underrepresentation of Bayesian or 'two-point' methods included lack of simplicity, equipment and trained staff; however, the majority of respondents deemed an implementation of these approaches likely if more information was offered ('somewhat/very likely':'not at all likely' Germany 3.3:1/Austria 6.5:1).

Conclusions. The survey revealed a diversity of current practices for vancomycin dosing and a focus on trough concentration-based TDM. The study highlights the need of and–importantly–high acceptance of clinicians towards training in Bayesian dosing as required to apply the latest AUC-based dosing guidelines. Furthermore, it lays the basis for pharmacometric investigations on how well the different dosing strategies meet therapeutic targets, with the ultimate goal to aid vancomycin dosing, reduce vancomycin-related toxicity and ultimately improve patient outcomes.

Key words: Vancomycin, TDM, survey