

Time to target Vancomycin levels with loading dose capping according to local tertiary hospital guidelines

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Aim

To assess the suitability of local guidelines by determining the time taken for vancomycin to reach a target trough level when the 25-30mg/kg loading dose is capped at 2000mg.

Background

Vancomycin is a glycopeptide antibiotic with a narrow therapeutic index. Therapeutic drug monitoring is required to ensure that serum trough levels remain within the target range of 15-20 mg/L.

Weight-based loading doses (e.g., 25-30mg/kg) are used for more rapid attainment of target levels.

Recent evidence suggests that loading dose capping to a maximum of 2000mg is conservative and may cause delays to target levels.

Method

A single-centre, retrospective audit of electronic medical records linked to patients prescribed intravenous vancomycin for at least 48 hours duration between 1st January 2021 and 31st December 2021. Additional inclusion criteria were:

- Age \geq 18 years,
- Weight > 80 kg, and
- Vancomycin administered and monitored according to local guidelines.

Patients in the intensive care unit were excluded due to potential for altered pharmacokinetics.

The relevant ethics approvals were obtained.

Results

Eighty-one patients met the inclusion criteria.

- Target levels were not ever reached (i.e., levels remained subtherapeutic) in 42% (34/81) of patients.
- When target levels were reached, the average time taken was **73.6 hours**.
- Only 26% (21/81) of patients attained a target trough level within the initial 48 hours of therapy.

26%

Reached target level within 48 hrs

32%

Reached target level in > 48 hrs

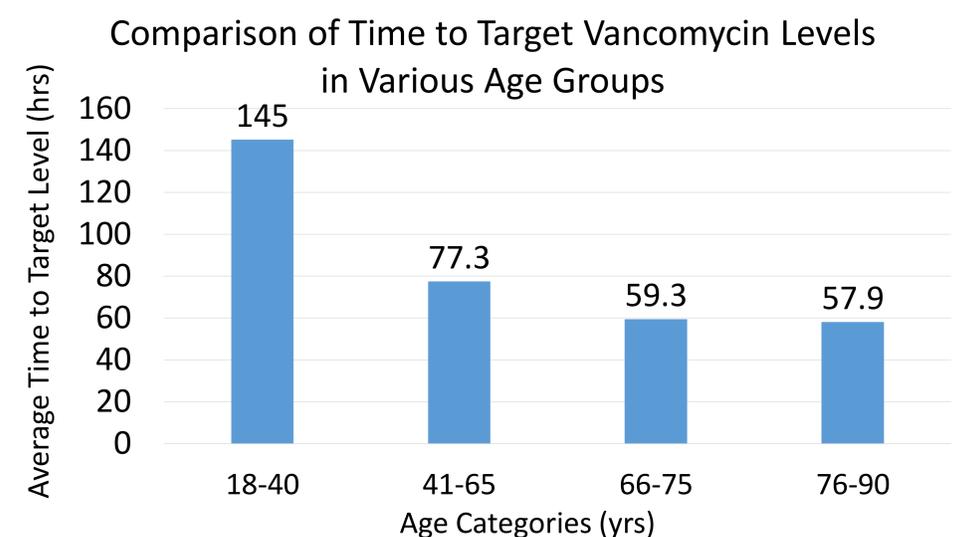
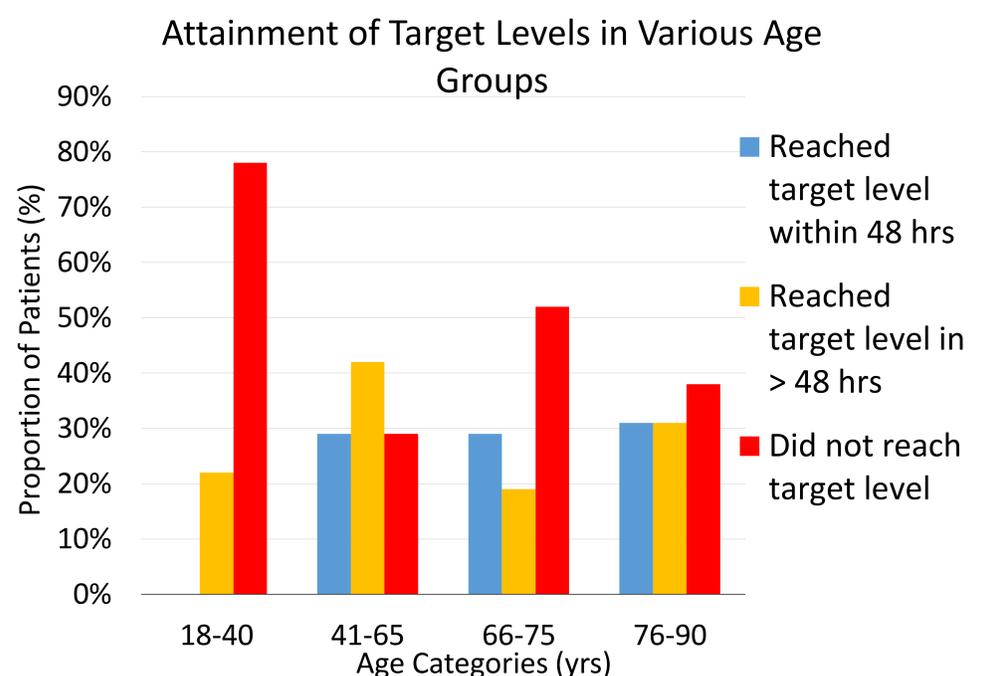
42%

Did not ever reach target level

A higher proportion of patients with a creatinine clearance (CrCl) of less than 60ml/min reached target levels within 48 hours, however this correlation was **not** statistically significant.

Results – Ctd.

A statistically significant relationship was found between increasing age and faster time to target level ($P < 0.05$).



Conclusions

There were substantial delays to target levels when these local guidelines were followed.

The results support use of a larger loading dose cap (e.g., 3000mg), in line with international guidelines.

Age-related changes in pharmacokinetic variables (such as volume of distribution, protein binding, and renal function) should be considered alongside patient weight when reviewing and optimising local vancomycin dosing guidelines.



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