This observational study aims to describe the population pharmacokinetics of vancomycin in adult patients with sepsis or septic shock” Heffernan et al (2019).

Abstract:

PURPOSE: Vancomycin is commonly used for the management of severe infections; however, vancomycin dosing may be challenging in critically ill patients. This observational study aims to describe the population pharmacokinetics of vancomycin in adult patients with sepsis or septic shock.

METHODS: A single-centre retrospective review of adult patients with sepsis or septic shock receiving vancomycin with therapeutic drug monitoring was undertaken. Blood samples taken 1 h after the vancomycin infusion cessation and 30 min prior to the next dose were assayed using the Vitros Crea Slide method. Vancomycin concentrations determined on different days were included. A pharmacokinetic model was developed using Pmetrics for R. Monte Carlo dosing simulations were performed using the final model.

RESULTS: Vancomycin concentrations were available for 27 adult patients admitted to the intensive care unit with sepsis or septic shock. A one-compartment pharmacokinetic model with inter-occasion variability of clearance and volume of distribution before and after 72 h adequately described the data. Creatinine clearance normalized to body surface area was included as a covariate on vancomycin clearance. The clearance and volume of distribution
within 72 h of admission were 7.29 L/h and 54.20 L, respectively. Monte Carlo simulations suggested that for patients with a creatinine clearance of $\geq 80$ mL/min/1.73 m², vancomycin doses of $\geq 2$ g every 8 h are required to consistently achieve key therapeutic targets.

**CONCLUSIONS:** Vancomycin doses $\geq 2$ g every 8 h in adult patients with sepsis or septic shock with a creatinine clearance $\geq 80$ mL/min/1.73 m² are likely needed to achieve an optimal therapeutic exposure.

**You may also be interested in...**

- Pharmacokinetics of Cefazolin and Vancomycin in Infants
- Relationship between hemoglobin levels and vancomycin clearance
- Pharmacokinetics of vancomycin during the initial loading dose

**Reference:**