Vancomycin target attainment against Gram-positive MIC 2 mg/L strains in critically ill burn patients

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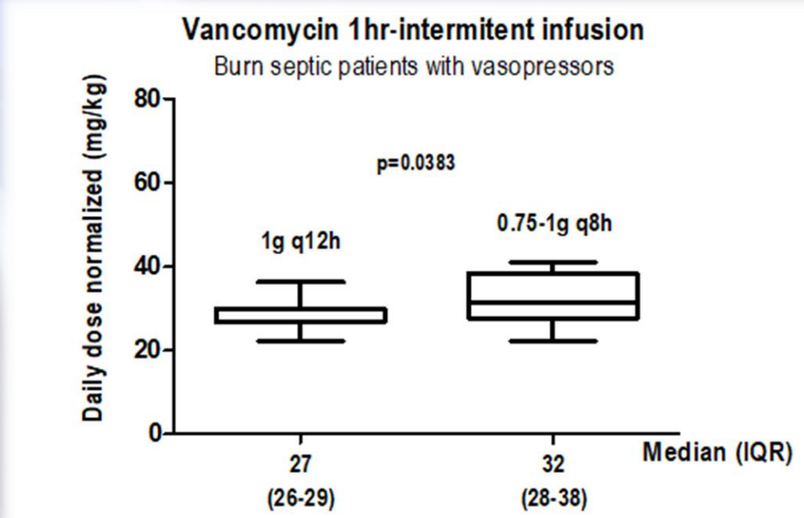
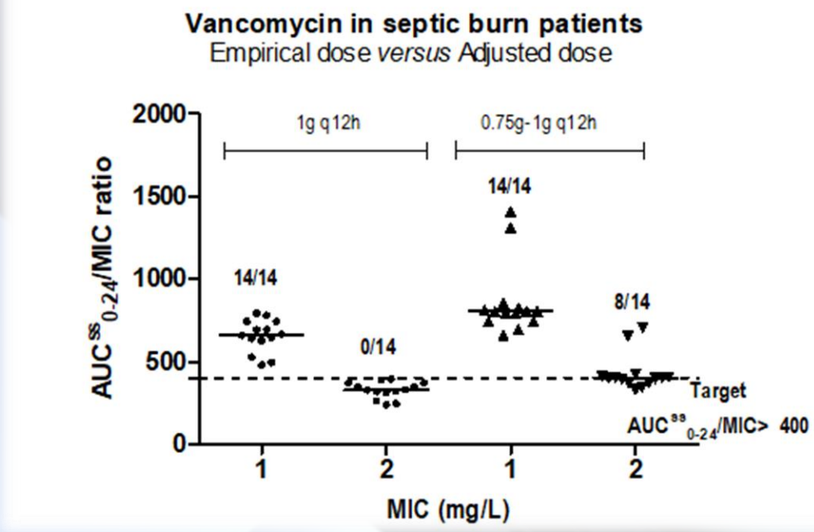
Introduction: The initial empiric dose regimen of vancomycin usually fails to reach the target in critically ill patients against the most common pathogens with MIC > 1 mg/L, impacting clinical outcome.

Objective: The objective of the study was to compare vancomycin empirical dose with adjusted dose based on pharmacokinetic-pharmacodynamic (PK/PD) approach in septic burn patients.

Methods: Adult patients with preserved renal function receiving intravenous vancomycin were investigated after the empiric daily dose and after dose adjustment. Therapy started with 1g twice daily, one hour pump infusion, and the dose was adjusted if required based on PK/PD target: area under the curve/minimum inhibitory concentration (AUC^{ss}_{0-24}/MIC > 400). Two steady state blood samples were collected (2 mL/each) at the 3rd and 11th of the starting of infusion for drug serum measurement by liquid chromatography. The one compartment open model with first-order kinetics was applied to estimate the pharmacokinetic parameters.

Results: Fourteen septic burn patients were included. The patients had (medians): 27 yrs, 74.5 kg, 30% total burn surface area, SAPS3 63. Pharmacokinetic parameters were altered at the earlier period of septic shock with increases in vancomycin clearance and decreased biological half life. With empiric regimen, all patients achieved the target against Gram-positive strains up to MIC 1 mg/L. After dose adjustment (0.75-1g q8h) the target attainment was extended to 57% of burn patients against Staphylococcus spp. with MIC 2 mg/L. Clinical cure occurred for all patients.





Conclusion: Critically ill burn patients present changes in pharmacokinetics that impact therapeutic target attainment of vancomycin. Individualized dose adjustments must be done soon to eradicate Gram-positive strains, including those with higher MIC values.

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