

00180 **Evaluating the Relationship Between Vancomycin Trough Concentration and 24-hour Area Under the Concentration-time Curve in Neonates**

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Aims: Bacterial sepsis is a major cause of morbidity and mortality in neonates, especially those involving methicillin-resistant *Staphylococcus aureus* (MRSA). Guidelines by the Infectious Diseases Society of America recommend the vancomycin 24-h area under the concentration-time curve to MIC ratio (AUC₂₄/MIC) of 400 as the best predictor of successful treatment against MRSA infections when the MIC is 1 mg/liter. The relationship between steady-state vancomycin trough concentrations and AUC 24 values (mg·h/liter) has not been studied in an Asian neonatal population.

Methodology: We conducted a retrospective chart review in Singapore hospitals and collected patient characteristics and therapeutic drug monitoring data from neonates on vancomycin therapy over a 5-year period. A one-compartment population pharmacokinetic model was built from the collected data, internally validated, and then used to assess the relationship between steady-state trough concentrations and AUC₂₄. A Monte Carlo simulation sensitivity analysis was also conducted.

Result: A total of 76 neonates with 429 vancomycin concentrations were included for analysis. Median (interquartile range) was 30 weeks (28 to 36 weeks) for postmenstrual age (PMA) and 1,043 g (811 to 1,919 g) for weight at the initiation of treatment. Vancomycin clearance was predicted by weight, PMA, and serum creatinine. For MRSA isolates with a vancomycin MIC of 1, our major finding was that the minimum steady-state trough concentration range predictive of achieving an AUC₂₄/MIC of 400 was 8 to 8.9 mg/liter.

Conclusion: Steady-state troughs within 15 to 20 mg/liter are unlikely to be necessary to achieve an AUC₂₄/MIC of 400, whereas troughs within 10 to 14.9 mg/liter may be more appropriate.