Evaluation of Vancomycin Dosing and Corresponding Drug Concentrations in Neonatal Intensive Care Unit (NICU) Patients

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Published In/Presented At

Lan, C., & Boucher, J. (2013). *Evaluation of vancomycin dosing and corresponding drug concentrations in neonatal intensive care unit (NICU) patients.* Poster presentation.

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Purpose:

The primary objective of this study is to retrospectively review the relationship between vancomycin dosing strategy, age and attained vancomycin trough concentrations.

Background:

- Vancomycin is the drug of choice for empirical treatment of late-onset septicemia in preterm infants[1,2]
- Many barriers to develop an optimal dosing regimen in neonates[3,4,5]
  - High interpatient and intrapatient variablility in vancomycin pharmacokinetics
- Expert consensus guidelines recommend for more aggressive dosing and higher trough concentrations of vancomycin for the treatment of methicillin-resistant Staphylococcus aureus (MRSA) infections[6,7]
  - Guidelines do not include neonatal population
  - Lack of guidance on utilization of trough goals of 15-20 mcg/ml in the neonate
- Lack of consensus for optimal dosing of vancomycin in preterm and full term neonates

Study Design:

- Retrospective chart review
- Inclusion Criteria:
  - All neonatal patients [age 0 to 46 weeks post-menstrual age (PMA)]
  - Received intravenous (IV) treatment with vancomycin July 1, 2008 to June 30, 2013
  - Had at least one trough concentration that was obtained 0-90 minutes before a dose at steady state
- Exclusion Criteria:
  - Received IV treatment with vancomycin prior to June 30, 2008
  - No trough concentration reported during treatment.
  - Age greater than 46 weeks PMA
- The primary outcomes of the study:
  - Number of patients achieving a target trough concentration of 5-15 mcg/ml in each dosing group and age group
  - Average vancomycin dose necessary to achieve the target trough in each age group

References:

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Methods:

- Stratify patients into predetermined categories:
  - Vancomycin dosing and age range
- Assess relationship between categories
- Evaluate attainment of vancomycin concentrations within each category
- Patient-specific information to be collected will include:
  - Age [PMA and Postnatal age (PNA)]
  - Weight
  - Vancomycin dose and frequency
  - Days of vancomycin therapy
  - Measured vancomycin trough concentrations
  - Timing of vancomycin trough concentrations
  - Location of infection and organism
  - Documentation of organism eradication via cultures or clinical determination by the neonatologist
  - Daily serum creatinine from drug initiation to discontinuation
  - Presence of any co-administered nephrotoxic drugs

Disclosure:

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

- Christine Lam – nothing to disclose
- Jenny Boucher – nothing to disclose