Vancomycin AUC:MIC performance was modest and inconsistent. Analysis was limited by studies without sufficient data, therefore meta-analytic results may overestimate TPC values. Given this, as well as the lack of standardization of methods, widespread adoption of AUC:MIC as the preferred vancomycin monitoring parameter may be premature” Dalton et al (2019).

Abstract:

Background: Vancomycin is a first-line antibiotic for methicillin-resistant Staphylococcus aureus infections or other Gram-positive infections. Area under the curve (AUC) to minimum inhibitory concentration (MIC) ratio is proposed as a therapeutic drug monitoring parameter. How well clinical efficacy is predicted by this measure has not been established.

Objective: Determine the test performance characteristics (TPC) of AUC:MIC of vancomycin for prediction of positive outcome.

Data Sources: PubMed and Ovid Medline (1946 to 2018) and EMBASE (1974 to 2018).

Study Eligibility Criteria and Participants: Studies of patients treated with vancomycin for any type of infection in peer reviewed publications. All patient populations were included.
Interventions: Vancomycin AUC:MIC or AUC was related to patient clinical outcome.

Methods: Searches of medical databases using relevant terms were performed. Screening, study reviewing, data extracting and assessing data quality was performed independently by two reviewers. Studies were stratified by type of primary outcome for calculation of pooled sensitivity, specificity and construction of hierarchical summary receiver operating characteristic (HSROC) curves.

Results: Nineteen studies including 1699 patients were meta-analyzed. Pooled sensitivity and specificity were, 0.77 (95% CI 0.67-0.84) and 0.62 (95% CI 0.53-0.71) respectively for the 7 studies with primary outcome of mortality and 0.65 (95% CI 0.53-0.75), 0.58 (95% CI 0.48-0.67) for studies with composite or clinical cure outcome (n= 12). HSROC curves suggested considerable heterogeneity. An additional 11 studies are described but could not be included for meta-analysis because data were not available. The majority of these studies (9/11) failed to demonstrate a relationship between AUC:MIC and positive clinical outcome.

Conclusions: Vancomycin AUC:MIC performance was modest and inconsistent. Analysis was limited by studies without sufficient data, therefore meta-analytic results may overestimate TPC values. Given this, as well as the lack of standardization of methods, widespread adoption of AUC:MIC as the preferred vancomycin monitoring parameter may be premature.

Registration: Prospero registration number: CRD42019123116.

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Reference:
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