

EVALUATION OF AUC/MIC AS A PREDICTOR OF MICROBIOLOGICAL AND CLINICAL OUTCOMES IN STAPHYLOCOCCUS GRAM-POSITIVE BACTEREMIA TREATED WITH VANCOMYCIN

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BACKGROUND AND IMPORTANCE

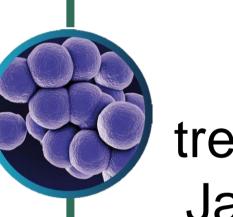
Vancomycin's role in treating gram-positive infections is well-established, yet the optimal AUC/MIC ratio for non-Methicillin-Resistant Staphylococcus aureus (MRSA) bacteremia remains undefined. While a 400-600 mg-h/L AUC/MIC target is recommended for MRSA, this guideline is extrapolated and may not fully apply to other Staphylococcal species. This study assesses AUC/MIC's ability to predict microbiological and clinical outcomes in non-MRSA Staphylococcal bacteremia.

AIM AND OBJECTIVES

Assess whether an AUC/MIC ratio of 400-600 is predictive of clinical and microbiological outcomes in non-MRSA Staphylococcal-bacteremia treated with vancomycin.

MATERIALS AND METHODS

Retrospective descriptive study



Patients with non-MRSA Staphylococcus bacteremia treated with vancomycin between January 2020 - September 2024

- Demographic (age, sex)
- AUC/MIC
- Bayesian estimated renal clearance (CL)
- Creatinine progression in 48 hours
- Complicated or uncomplicated infection

Definitions

Variables collected

- Clinical cure as normalization of at least 2 out of 3 markers (temperature, C-reactive protein, leukocytes) at 48-72 hours
- Microbiological cure as negative blood cultures at 120 hours
- Statistical analysis was performed using Rstudio® (version 2023.12.1) \rightarrow logistic regression models to evaluate the relationship between AUC/MIC and both microbiological and clinical outcomes.
- Receiver operating characteristic (ROC) curves were used to assess the predictive power of the models, and AUC values were calculated for both microbiological and clinical outcomes.

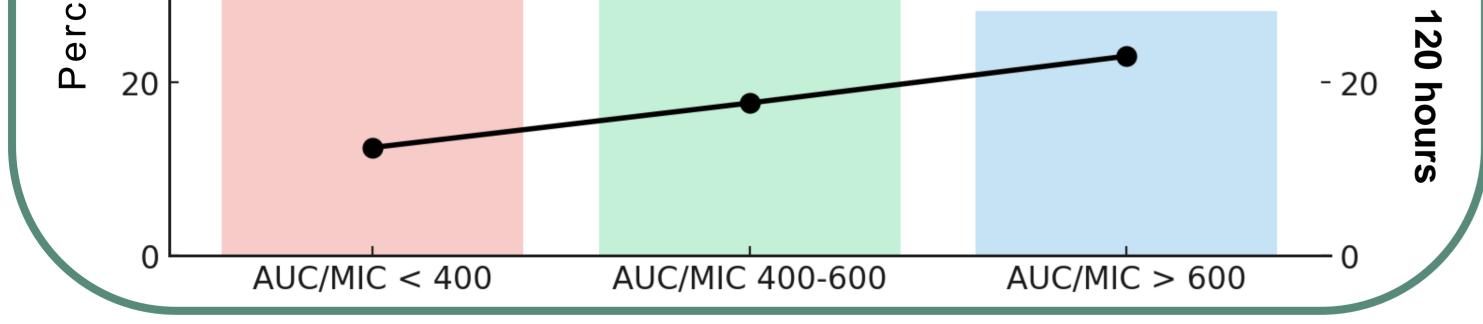
RESULTS



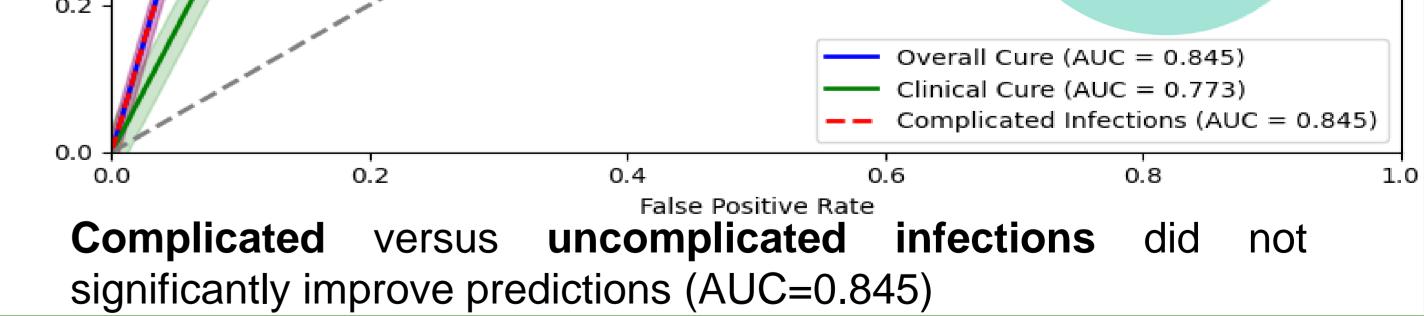
Mean age 63.50 years (SD: 14.7) **58.70%** male

Mean Bayesian renal CL: 5.19 L/h (SD: 1.85) Acute kidney injury (AKI) due to treatment was developed in 4.52% of patients* *data collection under 48 hours may have limited additional cases

AUC/MIC Target ROC Curves for Predictive Models with Confidence Shading - 100 100_Γ 24-48 hours after Initial Vancomycine dose 1.0 Mic **Overall microbiological cure (82.6%)** Microbiological Cure (%) obiological (%) - 80 80 0.8 **Proportion of Complicated vs.** atients **Non-Complicated Infections 12.5% achieved** microbiological cure 9.0 Rate True Positive F 60 - 60 Clinical cure (50.0%) 0 26.0% of Rate <u>37.0%</u> Φ Complicated (N=12) ntag <u>34.8%</u> (%) - 40 40 Non-Complicated (N=34) 74.0% **28.3%** at Φ



91.30% of cases accounted for Coagulase-negative Staphylococci (CoNS)



CONCLUSION AND RELEVANCE

- Achieving an AUC/MIC of 400-600 was predictive of microbiological cure in non-MRSA bacteremia, but the predictive ability for clinical cure is lower, likely due to the sample size and limited treatment failures.
- Further research with larger cohorts is needed to validate these findings, particularly in complicated-versus-uncomplicated infections.

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Authors declare no conflicts of interest