Poster # 220

MedStar Health

# Acute kidney injury incidence comparison of vancomycin trough-based vs AUC/MIC monitoring at a tertiary care hospital

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## Background and Objective

- Therapeutic drug monitoring (TDM) of vancomycin is fundamental to optimizing efficacy and adverse effects.
- The Infectious Diseases Society of America (IDSA) guidelines now recommend vancomycin dosing based on area under the curve/minimum inhibitory concentration (AUC/MIC).
- The primary objective was to compare the incidence of acute kidney injury (AKI) utilizing trough vs AUC/MIC vancomycin monitoring.

## Methodology

- Retrospective cohort study of 371 patients ≥18 years old who received vancomycin for >48 hours from January to June 2019 for trough-based dosing and July to December 2021 for AUC/MIC dosing. Patients who developed AKI within 48 hours of vancomycin were excluded.
- The primary outcome was incidence of AKI per Kidney Disease Improving Global Outcomes (KDIGO) definition. Data were analyzed using a multivariate logistic regression model.

## Results

- The median age was 62 (49-73) and 59 ( 45-68) years for the trough and AUC/MIC cohorts, respectively.
- Most patients were admitted to non-ICU units ( $n_T$ = 138 and $n_{AUC}$ = 99).
- The most common infections were pneumonia ($n_T$ = 29% and $n_{AUC}$ = 20%) and soft tissue infections ($n_T$ = 23% and $n_{AUC}$ = 32%).
- Supratherapeutic vancomycin levels occurred in 19.3% and 9.2% in the trough and AUC/MIC groups, respectively.

**Figure 1. Incidence of acute kidney injury by group**

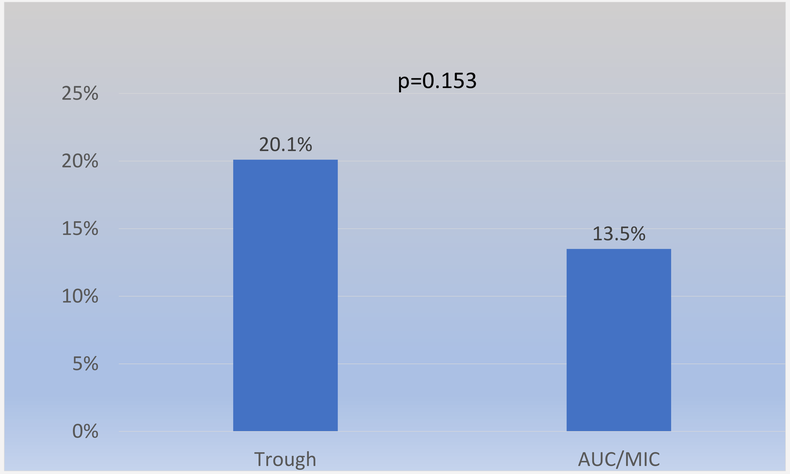


**Table 1. Frequency of concomitant nephrotoxic agents**

| | | Trough levels n=229 | AUC/MIC n=142 |
|---|---|---|---|
| Diuretics | Yes | 73 (31.9%) | 34 (24.1%) |
| Piperacillin/tazobactam | Yes | 146 (63.8%) | 76 (53.5%) |
| Aminoglycosides | Yes | 26 (11.4%) | 1 (0.7%) |
| Cefepime | Yes | 46 (20.1%) | 35 (24.6%) |
| IV contrast | Yes | 80 (34.9%) | 47 (33.1%) |
| Vasopressors | Yes | 38 (16.6%) | 29 (20.4%) |
| NSAIDs | Yes | 33 (14.4%) | 11 (7.7%) |
| Acyclovir | Yes | 14 (6.1%) | 6 (4.2%) |

NSAID: Non steroid anti inflammatory drugs

**Table 2. Multivariate logistic regression model**

| | OR (95% CI) | P-value |
|---|---|---|
| Trough vs AUC/MIC | 1.1 (0.58-2.12) | 0.777 |
| Piperacillin/tazobactam | 1.72 (0.91-3.39) | 0.105 |
| Cefepime | 0.99 (0.45-2.06) | 0.984 |
| ICU admission | 1.81 (0.96-3.41) | 0.065 |
| Supratherapeutic levels | 5.89 ( 3.03-11.54) | <0.001 |
| Diuretics | 1.41 (0.73-2.66) | 0.298 |

## Conclusion

- The incidence of AKI was higher in the vancomycin trough-based cohort vs AUC/MIC cohort.
- The difference was not statistically significant, but these findings are clinically relevant to practice.
- These findings align with the IDSA guidelines and suggest that vancomycin AUC/MIC monitoring may cause less nephrotoxicity.

## References

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