Time to Therapeutic Goal is Faster with Continuous Infusion Vancomycin for Methicillin-Resistant *Staphylococcus aureus* Bloodstream Infections

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SCAN FOR ABSTRACT

Introduction

- In most hospitals vancomycin is commonly administered as an intermittent infusion, however, vancomycin's stability at room temperature permits continuous administration over 24 hours
- The 2020 IDSA guidelines endorsed continuous infusion vancomycin (CIV) as it may result in more rapid attainment of target serum drug concentrations, provide ease of monitoring, and decreased risk of nephrotoxicity as compared to intermittent infusion vancomycin (IIV)
- Our institution has been using CIV for approximately 20 years for serious infections that require prolonged durations of therapy, such as MRSA bacteremia

Aim: To examine the outcomes associated with CIV as compared to IIV

Methods

Single-center, retrospective cohort study from January 2018 to December 2021

Inclusion Criteria

- ≥ 18 years of age
- ≥ 1 MRSA (+) blood culture
- IV vancomycin for > 10 days
- Follow up in OPAT clinic

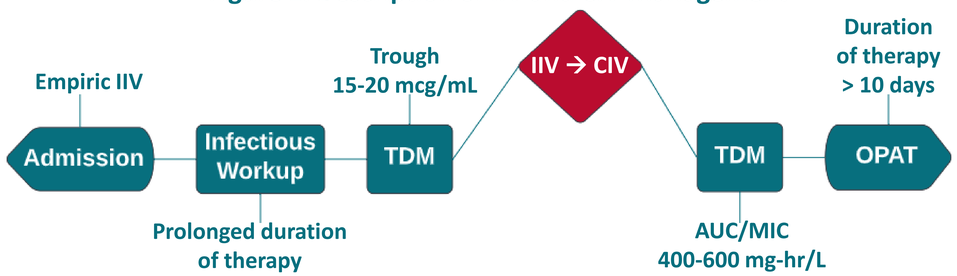
Exclusion Criteria

- Pregnancy
- Vancomycin duration of therapy ≤ 10 days
- Diagnosed with MRSA bacteremia at an outside hospital

Primary Outcomes
Time to therapeutic goal and proportion of patients who developed an adverse event
• Nephrotoxicity: 50% or 0.5 mg/dL increase in Scr
• Leukopenia: WBC < 4,000 WBCs/µL

Secondary Outcomes
All-cause readmission, mortality, and MRSA infection relapse at any site 30 days after completion of therapy

Figure 1. Description of IIV and CIV Management



Results

Table 1. Baseline Characteristics, N = 65

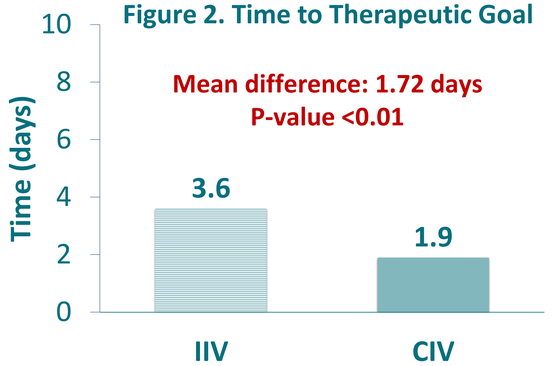
Demographics	
Age, y (range)	48 (26-87)
Male, n (%)	44 (67.7)
Race, n (%)	
Hawaiian Native/Pacific Islander	1 (1.5)
Black/African American	4 (6.2)
American Indian/Alaskan Native	12 (18.5)
White/Anglo	44 (67.7)
Unavailable	2 (3.1)
Ethnicity, n (%)	
Hispanic/Latino	14 (22.2)
Non-Hispanic/Latino	48 (73.8)
Unavailable	1 (1.5)
BMI, kg/m	27.4 (25.2-17)
Comorbidities	
Sars-CoV-2, n (%)	0 (0)
Malignancy, n (%)	2 (3.1)
Liver disease, n (%)	3 (4.6)
Kidney disease, n (%)	3 (4.6)
COPD, n (%)	4 (6.2)
Heart disease, n (%)	9 (13.8)
Injection drug use, n (%)	20 (30.8)
Diabetes, n (%)	30 (46.2)
Infection-related	
Foci of infection, n (%)	
Pneumonia	1 (1.5)
Prostatic abscess	1 (1.5)
Septic arthritis	2 (3.1)
Prosthetic joint	4 (6.2)
Central line-associated	5 (7.7)
Endocarditis	9 (13.8)
Osteomyelitis	13 (20)
Skin/soft tissue	21 (32.3)
Unknown/unclear	7 (10.8)
Pitt bacteremia score, n (%)	
0 - 1	45 (69.2)
2 - 3	16 (24.6)
4 - 5	4 (6.1)

Median hospital length-of-stay:
13 days
(range, 2-39 days)

Median duration of vancomycin therapy:
38 days
(range, 7-62 days)

Median time on IIV prior to CIV:
5 days
(range, 1-18)

Figure 2. Time to Therapeutic Goal



- **On average, patients on IIV took 3.6 days to reach the target goal, compared to 1.9 days when switched to CIV**
- Fewer patients achieved therapeutic goal while on IIV compared to their time on CIV: **52.3% vs. 83.1%, p < 0.01**
- Of the 31 patients that did not reach a therapeutic trough on IIV, **87.1%** of the patients were able to reach a therapeutic goal when switched to CIV

Table 2. Primary and Secondary Outcomes

Variable	IIV	CIV	Variable	All Patients
Adverse Drug Reactions			30-Day, All-Cause	
Nephrotoxicity	3	9	Readmission	6
Leukopenia	2	5	Mortality	0
Other	0	3	Relapse	0
Total	5	17*	Total	6

*One patient experienced both leukopenia and nephrotoxicity on CIV

Conclusions

- CIV appears to result in more rapid attainment of therapeutic goal and no patients experienced relapse of MRSA infection or mortality
- It is unclear how the initial IIV regimen impacted the incidence of nephrotoxicity after patients were transitioned to CIV

References

Rybak MJ, Le J, Lodise TP, et al. Therapeutic monitoring of vancomycin for serious methicillin-resistant Staphylococcus aureus infections: A revised consensus guideline and review by the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, the Pediatric Infectious Diseases Society, and the Society of Infectious Diseases Pharmacists. American Journal of Health-System Pharmacy. 2020;77(11):835-864. doi:10.1093/ajhp/zxaa036