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Vancomycin Auc Monitoring In Individuals With Cystic Fibrosis

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Background

- Methicillin resistant *Staphylococcus aureus* (MRSA) infects 20-25% of people with CF (pwCF) and is associated with increased morbidity
- Treatment of pulmonary exacerbations (PE) often requires hospitalization including increased respiratory treatments and IV antimicrobials
- IV vancomycin (IV VANC), which is commonly used for MRSA infections, requires serum concentration monitoring to ensure efficacy and minimize toxicity
- Previous monitoring guidelines suggested trough concentrations to predict efficacy and toxicity; recent guidelines recommend using area under the curve (AUC) modeling
- Children's Mercy Kansas City (CMKC) changed IV VANC monitoring from trough to AUC measurement on 01 May 2020

Methods

- A retrospective chart review collected trough monitoring data for all pwCF that received IV VANC at CMKC from 01 January 2019 to 31 December 2019
- Data for all pwCF treated with IV VANC after the AUC monitoring change was prospectively collected from 01 May 2020 to 28 February 2021
- Data collection included: patient demographics, details of IV VANC therapy (dose, frequency, total exposure, nephrotoxicity), and monitoring data (serum concentrations and AUC modeling)
- Descriptive statistics were used to assess pre- and post-implementation data. Chi-squared and t-test were used to determine differences between groups

Results

Trough Concentration Monitoring
01.01.2019 to 12.31.2019
25 individuals received 42 courses of IV VANC

Demographic Characteristic	n = 25
Female Sex	14 (56)
Median Age (years)	14.02 (4.25-20.25)

AUC Concentration Monitoring
05.01.2020 to 02.28.2021
15 individuals received 8 courses of IV VANC

Demographic Characteristic	n = 15
Female Sex	5 (63)
Median Age (years)	17.96 (7.60-20.10)

Details of Vancomycin Therapy

Vancomycin Therapy Characteristic	Trough Monitoring	AUC Monitoring	
Mean Treatment Duration (days)	10.46 ± 4.88	9.62 ± 2.99	p = 0.53 95% CI = -1.85 to 3.55
Mean Daily IV VANC Exposure (mg/kg/day)	71.34 ± 10.63	75.25 ± 10.72	p = 0.23 95% CI = -10.34 to 2.50
Number of Treatment Courses Achieving Therapeutic Target (n, %)	18 (43)	15 (100)	p ≤ 0.0001
Mean Time to Therapeutic Concentration (hours)	86.33 ± 75.80	28.94 ± 27.32	p = 0.0092 95% CI = 15.28 to 99.50
Mean Number of Phlebotomies	3.71 ± 1.61	3.73 ± 1.62	p = 0.97 95% CI = -0.99 to 0.95

Conclusions

- Changing to AUC monitoring for IV VANC among pwCF was not associated with a significant change in daily IV VANC exposure, duration of treatment, or number of phlebotomies
- More treatment courses achieved therapeutic targets with AUC monitoring compared to trough monitoring
- AUC monitoring resulted in a significant decrease in mean time to therapeutic concentration by 57.39 hours