5-2021

Vancomycin Auc Monitoring In Individuals With Cystic Fibrosis

Claire Elson

Ellen Meier

Stephanie Duehlmeyer

Christopher M. Oermann

Vancomycin AUC Monitoring in Individuals with Cystic Fibrosis

E. Claire Elson, PharmD, BCPPS; Ellen Meier, APRN; Stephanie Duehlmeyer, PharmD, BCPPS; Christopher M Oermann, MD

Children's Mercy Kansas City

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