11-2021

Vancomycin AUC monitoring in individuals with cystic fibrosis at a pediatric institution

Christopher M. Oermann
Children's Mercy Hospital

Stephanie Duehlmeyer
Children's Mercy Hospital

Ellen Meier
Children's Mercy Hospital

Claire Elson
Children's Mercy Hospital

Poster Number: 254

Vancomycin AUC Monitoring in Individuals with Cystic Fibrosis

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

Children's Mercy Kansas City, Kansas City, Missouri

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 (15-20mcg/mL) to predict efficacy and toxicity; recent guidelines recommend using area under the curve (AUC) modeling (400-600 mcg/ml*hr)
- 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 change to AUC monitoring was prospectively collected from 01 May 2020 to 31 July 2021
- Data collection included: patient demographics, details of IV VANC therapy (dose, frequency, total exposure, nephrotoxicity), and monitoring data (serum concentrations and AUC modeling)
- Therapeutic concentrations were defined as a trough between 15-20 mcg/mL and AUC/MIC between 400-600 mcg/ml*hr
- 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 Monitoring 01.01.2019 to 12.31.2019 25 individuals received 42 courses of IV VANC	AUC Monitoring 05.01.2020 to 07.31.2021 12 individuals received 20 courses of IV VANC	
Female Sex, n (%)	14 (56)	7 (58)	
Median Age (years)	14 (4-20)	16 (8-20)	
Mean Treatment Duration (days)	10.46 ± 4.88	9.87 ± 2.93	p = 0.608 95% CI = -1.76 to 2.98
Mean Daily IV VANC Exposure (mg/kg/day)	71.34 ± 10.63	75.68 ± 11.91	p = 0.153 95% CI = -10.34 to 1.66
Number of Treatment Courses Achieving Therapeutic Target (n, %)	18 (43)	19 (95)	p ≤ 0.0001
Mean Time to Therapeutic Concentration (hours)	86.33 ± 75.80	28.37 ± 25.98	p = 0.0037 95% CI = 21.16 to 100.53
Mean Number of Phlebotomies	4 ± 2	4 ± 2	p = 0.86 95% CI = -0.96 to 0.79

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 57.96 hours