

Incidence of Acute Kidney Injury in Outpatient Parenteral Antimicrobial Therapy (OPAT) Patients Receiving Vancomycin

Corresponding author:
Yasir Hamad
Yhamad@wustl.edu



Yasir Hamad¹ MD, Katelin B Nickel¹ MPH, Yvonne Burnett² PharmD, Margaret A Olsen¹ PhD

¹Division of Infectious Diseases, Washington University in St. Louis, Missouri

²University of Health Sciences and Pharmacy in St. Louis, St. Louis, Missouri



Introduction

- Outpatient Parenteral Antimicrobial Therapy (OPAT) is a convenient way for patients to complete prolonged courses of IV antimicrobials outside the hospital setting.
- OPAT has been associated with shorter duration of hospitalization and reduced healthcare expenditure.
- Vancomycin therapy is known to be associated with nephrotoxicity. Predictors of nephrotoxicity in outpatient settings are not well defined and have only been reported in relatively small studies.
- **Study Objective:** Evaluate the factors associated with incidence of nephrotoxicity during outpatient parenteral antimicrobial therapy using administrative data.

Methods

Study population:

- Data source: A large insurance claims database of privately insured patients (IBM-MarketScan)
- Inclusion criteria: Patients ages 18 - 64 from 2010 to 2016 who were discharged from the hospital on IV vancomycin at home with home health or at an infusion center.

Outcome:

- The primary endpoint was 42-day hospital readmission with acute kidney injury (AKI).

Statistical Analysis:

- A Chi-square test was used to examine associations with AKI.
- Factors with significant associations in univariate analysis were then incorporated into a multivariable logistic regression model.

Results

Table 1: Factors associated with AKI

	All Patients N = 14,196 n (%)	AKI During Readmission N=386 (3%) n (%)	No AKI During Readmission N = 13,811 (97%) n (%)	P- value	Multivariate analysis Odds Ratio (95% CI)	P- value
Age, years						
18-40	2405 (16.9)	46 (12.0)	2359 (17.1)		0.933 (0.637-1.365)	0.20
41-50	3086 (21.7)	69 (17.2)	3017 (21.8)	<0.01	Reference	
51-60	5235 (36.9)	151 (39.2)	5084 (36.8)		1.191 (0.889-1.595)	0.30
61-65	3470 (24.4)	119 (30.9)	3351 (24.3)		1.285 (0.945-1.748)	0.07
Sex, male	7635 (53.8)	212 (55.1)	7423 (53.8)	0.61		
Living in rural area	2207 (15.6)	46 (12.0)	2161 (15.7)	0.05	1.289 (0.939-1.769)	0.12
Region						
Northeast	2153 (15.2)	66 (17.1)	2087 (15.1)	0.19		
North Central	4100 (28.9)	109 (28.3)	3991 (28.9)			
South	5779 (40.7)	165 (42.9)	5614 (40.7)			
West	2164 (15.2)	45 (11.7)	2119 (15.3)			
Infectious Diseases consultation	7282 (51.3)	217 (56.4)	7065 (51.2)	0.04	1.159 (0.941-1.428)	0.16
Home therapy vs infusion center	12142 (85.5)	342 (88.8)	11800 (85.4)	0.06	1.305 (0.943-1.807)	0.11
Comorbidities						
Congestive heart failure	950 (6.7)	64 (16.6)	886 (6.4)	<0.01	1.981 (1.473-2.665)	<0.01
Chronic kidney disease	774 (5.5)	69 (17.9)	705 (5.1)	<0.01	2.937 (2.188-3.944)	<0.01
Diabetes mellitus	4602 (32.4)	164 (42.6)	4438 (32.1)	<0.01	1.179 (0.945-1.471)	0.14
Liver disease	524 (3.7)	29 (7.5)	495 (3.6)	<0.01	1.819 (1.223-2.706)	<0.01
Cancer	972 (6.9)	37 (9.6)	935 (6.8)	0.03	0.715 (0.503-1.018)	
Illicit drug use	567 (4.0)	20 (5.2)	547 (4.0)	0.22		

Table 1, continued

	All Patients N = 14,196 n (%)	AKI During Readmission N=386 (3%) n (%)	No AKI During Readmission N = 13,811 (97%) n (%)	P- value	Multivariate analysis Odds Ratio (95% CI)	P- value
Type of infection						
Bone and joint	4560 (32.1)	113 (29.4)	4447 (32.2)	0.24		
Septicemia	3824 (26.9)	161 (41.8)	3663 (26.5)	<0.01	1.772 (1.433-2.191)	<0.01
Intra-abdominal	1002 (7.1)	35 (9.1)	967 (7.0)	0.11		
MRSA infection	2508 (17.7)	83 (21.6)	2425 (17.6)	0.04	1.212 (0.940-1.563)	0.14
Concomitant antibiotics						
Penicillins	785 (5.5)	35 (9.1)	750 (5.4)	<0.01	1.773 (1.233-2.548)	<0.01
Cephalosporins	2907 (20.5)	79 (20.5)	2828 (20.5)	0.98		
Carbapenems	1550 (10.9)	32 (8.3)	1518 (11.0)	0.10		
Aminoglycosides	190 (1.3)	7 (1.8)	183 (1.3)	0.41		
Quinolones	233 (1.6)	5 (1.3)	228 (1.7)	0.59		

MRSA: Methicillin resistant staphylococcus aureus

Conclusion

- Septicemia, use of penicillins and some comorbidities were associated with AKI in patients treated with vancomycin OPAT.
- Patients at high risk for vancomycin nephrotoxicity should be monitored closely and an alternative therapy should be considered.

The authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have been a direct or indirect interest in the subject matter of this presentation.