



Real-World Experience with Omadacycline for Nontuberculous Mycobacterial and MDR/XDR Gram-Negative Infections: A Multicenter Evaluation

Taylor Morrisette¹, Julie V. Phillely², Carly Sigler², Jeremy J. Frens³, Andrew J. Webb⁴, Ryan W. Stevens⁴, Catessa Howard⁵, Jeannette Bouchard⁶, P. Brandon Bookstaver⁶, Melissa Barger⁷, Abdulhamid M. Lagnif¹, Sara Alosaimy¹, Michael J. Rybak^{1,8,9}
¹Anti-Infective Research Laboratory, Department of Pharmacy Practice, Eugene Applebaum College of Pharmacy and Health Sciences, Wayne State University, Detroit, Michigan, United States, ²Pulmonary and Critical Care Medicine, The University of Texas Health Science Center at Tyler, Tyler, Texas, United States, ³Department of Pharmacy, Moses H. Cone Memorial Hospital, Greensboro, North Carolina, United States, ⁴Department of Pharmacy, School of Health Sciences, Mayo Clinic, Rochester, Minnesota, United States, ⁵Department of Pharmacy, West Virginia University, Morgantown, West Virginia, United States, ⁶University of South Carolina College of Pharmacy, Columbia, South Carolina, United States, ⁷Ventura County Medical Center, Ventura, California, United States, ⁸Division of Infectious Diseases, Department of Medicine, Wayne State University, Detroit, Michigan, United States, ⁹Department of Pharmacy, Detroit Medical Center, Detroit, Michigan, United States



Address correspondence to:
 Michael J. Rybak
 m.rybak@wayne.edu

Background

- Omadacycline (OMC) is an aminomethylcycline antibiotic in the tetracycline class that has been Food and Drug Administration-approved for acute bacterial skin and skin structure infections and community-acquired pneumonia¹
- OMC has been shown to have potent *in vitro* activity against a broad-spectrum of Gram-positive and Gram-negative organisms, as well as Nontuberculous mycobacteria (NTM)²⁻³
- Due to its spectrum of activity and availability as an oral and intravenous agent, off-label utilization of OMC has been increasing⁴
- We aimed to evaluate the real-world effectiveness and safety of OMC for a variety of infections and pathogens

Methods

- A multicenter, retrospective, observational study conducted at six geographically distinct medical centers in the United States between January 2020 to June 2020
- We included patients ≥18 years of age who received ≥72 hours of OMC for any indication and/or pathogen
- Primary outcome was clinical success, which was defined as a lack of 30-day (non-NTM) or 90-day (NTM) mortality or microbiologic recurrence and absence of therapy alteration
- Secondary objectives were to evaluate reasons for OMC utilization and incidence of potential adverse effects attributable to OMC
- The CLSI breakpoints were applied for minimum inhibitory concentration (MIC) interpretation
- Multidrug-resistance (MDR) was defined as non-susceptibility to ≥1 agent in ≥3 antimicrobial categories, while extensively drug-resistance (XDR) was defined as non-susceptibility to ≥1 in all but ≤2 antimicrobial categories⁵
- Time-dependent outcomes were assessed following OMC initiation for mortality and following OMC discontinuation (if applicable) for microbiologic recurrence
- Microbiologic recurrence was defined as culture positive for the same organism isolated from index culture
- Descriptive statistics were utilized for analysis using SPSS statistics, IBM SPSS software, version 26.0 (IBM Corp., Armonk, NY).

Results

Table 1. Baseline/Clinical Characteristics for Gram-negative (A) and NTM (B) Infections

Characteristics	Results (n=7)	Characteristics	Results (n=11)
Age, years, median (IQR)	49.0 (40.5-55.5)	Age, years, median (IQR)	57.0 (54.0-61.0)
Male	6 (85.7)	Female	6 (54.5)
African American	4 (57.1)	Caucasian	10 (90.9)
Body mass index, mg/kg ² , median (IQR)	24.4 (22.2-24.8)	Body mass index, mg/kg ² , median (IQR)	24.0 (20.3-29.5)
Comorbid Conditions	----	Comorbid Conditions	----
-Hemiplegia	3 (42.9)	-Interstitial lung disease	5 (45.5)
-Heart Failure	1 (14.3)	-COPD	3 (27.3)
-CKD	1 (14.3)	-None	2 (18.2)
-None	2 (28.6)	Insurance	----
Insurance	----	-Private entity	6 (54.5)
-Medicare	4 (57.1)	-Medicare	3 (27.3)
-Private entity	3 (42.9)	Treatment Setting	----
Treatment Setting	----	-Strictly Outpatient	10 (90.9)
-Strictly Outpatient	5 (71.4)	-Inpatient, then outpatient	1 (9.1)
-Inpatient, then outpatient	2 (28.6)	Infection Source	----
Infection Source	----	-Nodular bronchiectatic	3 (27.3)
-Bone/joint	5 (71.4)	-Fibrocavitary	3 (27.3)
-IAI	2 (28.6)	-Bone/joint	2 (18.2)
OMC duration, days, median (IQR)	14.0 (13.0-48.5)	OMC duration, months, median (IQR)	6.4 (4.5-9.0)

Data reported as n (%) unless otherwise specified

CKD: chronic kidney disease;
 IAI: intra-abdominal infection;
 COPD: chronic obstructive pulmonary disease

Figure 1. Clinician Reasoning for Omadacycline Utilization

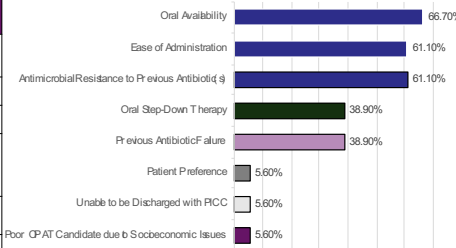
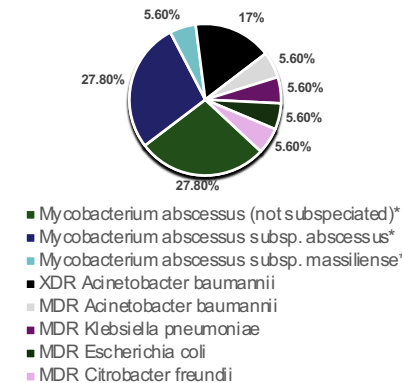


Figure 2. Isolated Bacterial Isolates



*erm gene genotyping was conducted in 8/11 (72.7%) of *M. abscessus* isolates, with 6/8 (75.0%) of isolates exhibiting functional *erm* gene expression

Results

Table 3. Clinical and Safety Outcomes

Outcomes	Result (Non-NTM: n=7; NTM: n=11)
Overall Composite Clinical Success (n=18)	15 (83.3)
Composite Clinical Success (Gram-negative; n=7)	5 (71.4)
-30-day mortality	0
-30-day microbiologic recurrence*	1 (14.3)
-Alteration of therapy*	2 (28.6)
Composite Clinical Success (NTM; n=11)	10 (91.1)
-90-day mortality	0
-90-day microbiologic recurrence	1 (9.1)
-Alteration of therapy	0
Overall Adverse Effect	3 (16.7)
Gastrointestinal (N/V/D)	1 (5.6)
Serum creatinine increase	1 (5.6)
AST/ALT increase	1 (5.6)

*One patient experience both 30-day recurrence and alteration of therapy

Conclusions

- OMC was effective and well-tolerated in this small sample for a variety of infections caused by various pathogens, including *M. abscessus* and MDR/XDR *A. baumannii* and *Enterobacteriaceae*
- Larger prospective real-world studies are essential to further confirm our early clinical findings

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Disclosures

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