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Real-World Use of Omadacycline in Physician Office Infusion Centers (POICs)

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Abstract

Background: Omadacycline (OMC) is approved for the treatment of community-acquired bacterial pneumonia and acute bacterial skin and skin structure infections. Real-world data on the use of OMC are limited. We present a multicenter observational review of OMC outpatient use in Infectious Disease POICs.

Methods: Medical records of patients (pts) receiving intravenous OMC from May 2019 to April 2022 from 5 POICs were included in this ongoing study. Data included demographics, diagnosis, medical history, microbiology, OMC regimen, adverse events (AEs), health care utilization and clinical outcomes. Clinical success was defined as complete or partial symptom resolution at completion of OMC with oral antibiotics as needed. Persistent or recurrent infection and premature discontinuation of OMC were deemed non-success. Indeterminate outcomes were excluded in outcome assessment. Chi Square, Fisher's exact, and t-test were used to identify characteristics associated with clinical outcome.

Results: Overall, 37 pts (mean age: 61±13 yrs, 65% male) were identified. Infections treated were 62% bone and joint (BJI), 24% complicated skin and skin structure infections (cSSSI), 11% pulmonary nontuberculous mycobacterial (NTM) and 3% diverticulitis. A total of 61 pathogens were identified in 30 pts of which 83% had ≥1 Gram-positive isolates. Polymicrobial pathogens were reported in 13/30 pts (43%). Ten pts (27%) received concomitant IV antibiotics. Median duration of OMC therapy was 38 days (IQR, 20-48). OMC was initiated in the POIC without prior hospitalization in 62% of pts. Overall clinical success was 74% (23/31). Non-success due to persistent infection was reported in 5 pts (3 BJI, 2 cSSSI), of which 4 were hospitalized. Three additional pts were deemed non-successful due to early discontinuations (2 difficulty with administration, 1 AE) (Fig 4). Six pts were non-evaluable for outcome. Ten pts reported 14 AEs, most commonly nausea (4 pts) and elevated liver function tests (3 pts).

Conclusion: These real-world results support the outpatient use of omadacycline in additional, difficult to treat, complicated infections, including bone and joint infections.

Background & Objectives

Omadacycline (OMC), a novel aminomethylcycline antibacterial derived from the tetracycline class, was approved by the FDA for the treatment of community-acquired bacterial pneumonia and acute bacterial skin and skin structure infections in adults.[1] To date, real-world data outside controlled clinical trials and FDA-approved indications are limited.[2-4] The objectives of this study were:

- to provide real-world evidence of intravenous OMC outpatient utilization in POICs
- to determine clinical outcome and safety of OMC used in POICs

Methods

Study design: Multicenter, real-world experience with retrospective cohort design

Study location: Healix-managed POIC

Study cohort: Pts (≥18 years) who received ≥1 IV dose of OMC for any diagnosis

Data source: Electronic healthcare records and pharmacy database of pts treated with intravenous OMC from May 2019 to Apr 2022

Data collection: Demographics, clinical characteristics, diagnosis, microbiology, OMC dose regimen and therapy duration, clinical outcome, and hospitalizations.

Outcome: Clinical success was defined as complete or partial symptom resolution of infection at end of IV OMC therapy with or without continued oral antibiotics. Persistent or recurrent infection and premature discontinuation of OMC were deemed non-success. Indeterminate outcomes were excluded from analysis.

Safety: any treatment-related adverse event

Analysis: Continuous data were reported as mean±SD or medians (IQR), categorical data as counts and percentages.

Study Population

- 37 pts from 5 ID POICs were included

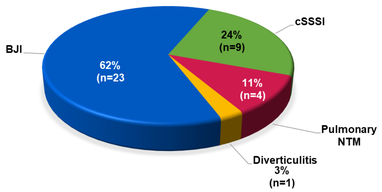
Table 1. Demographics and Clinical Characteristics

Variable	Results (N=37)
Age in years (mean±SD)	61±13
≥65	17 (46%)
Gender, male	24 (65%)
Body mass index ≥30 mg/kg²	20 (54%)
Charlson comorbidity index (median IQR)	4 (3-6)
Comorbidities	
hypertension	26 (70%)
diabetes mellitus	16 (43%)
cardiovascular disease	11 (30%)
chronic kidney disease	7 (19%)
mental disease	7 (19%)
asthma/COPD	5 (14%)
malignancy	4 (11%)
Location prior to POIC	
community	23 (62%)
hospital	14 (38%)
prior length of hospitalization in days (mean±SD)	8.2±3.6
IV therapy immediately prior to OMC	27 (73%)

Data are presented as no (%) unless otherwise indicated.
Abbreviations: COPD, chronic obstructive pulmonary disease; IV, intravenous; IQR, interquartile range; SD, standard deviation

Diagnosis

Fig. 1. Omadacycline Outpatient Utilization



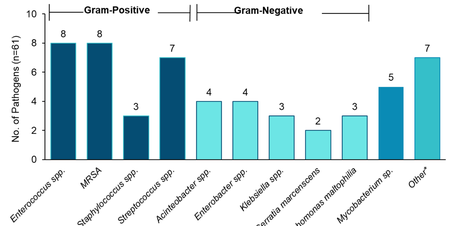
Abbreviations: BJI: bone and joint infection; cSSSI: complicated skin and skin structure infection; NTM: non-tuberculous mycobacteria infection.

- BJI (19 osteomyelitis, 4 prosthetic joint infections) accounted for the majority or pts (62%) including 8 (35%) with diabetic foot infections
- cSSSI (6 cellulits, 2 surgical site infections, 1 abscess) were complex infections with inherently resistant organisms.
- One diverticulitis patient developed a complicated intra-abdominal abscess

Microbiology

- Overall, 30 of 37 pts (81%) had positive cultures yielding 54 pathogens (19 Gram-positive, 23 Gram-negative, 5 Mycobacterium, 1 anaerobe)

Fig. 2. Distribution of Pathogens



*: Gram-positive: *Diphtheroids*, *Peptoniphilus*; Gram-negative:, *Citrobacter freundii*, *E. coli*, *Eikenella* sp., *Haemophilus parainfluenzae*, Other: *Bacteroides buccae*

- Gram-positive pathogens were identified in 25 pts (83%), most frequently *Enterococcus* spp., MRSA, and *Streptococcus* spp.
- Gram-negative pathogens were reported in 18 pts (60%), most frequently *Acinetobacter* spp. and *Enterobacter* spp.
- Other gram-negative pathogens reported not related to omadacycline use were 3 *Pseudomonas aeruginosa*, 1 *Morganella morganii*
- 13 pts (43%) had mixed Gram-positive/Gram-negative pathogens (7 BJI, 6 cSSSI)

OMC Therapy Characteristics

Table 2. OMC Therapy Characteristics

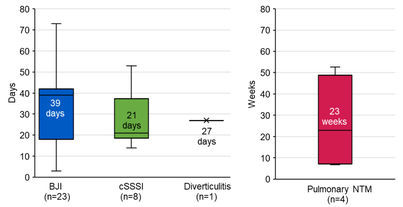
Diagnosis	No. Pts (n=37)	Loading Dose	Maintenance Dose	Infusion Device
BJI	23 (100%)	Day 1: 200 mg IV	100 mg IV q24h	Pump (14), ED (9)
cSSSI	8 (89%)	Day 1: 200 mg IV	100 mg IV q24h	ED (7), Pump (1)
	1 (11%)	---	100 mg IV q24h ---	Pump (1)
Pulmonary NTM	3 (50%)	---	100 mg IV q24h ---	ED (2) Pump (1)
	1 (25%)	Day 1: 200 mg IV	100 mg IV q24h	ED (1)
Diverticulitis	1 (100%)	Day 1: 200 mg IV	100 mg IV q24h	ED (1)

*: ED: elastomeric device pump

- Intravenous antibiotic (IVAB) therapy was captured; concurrent oral therapy was not available
- 33 of 37 pts (89%) received IV loading doses of 200 mg OMC on day 1 followed by 100 mg OMC IV maintenance dose q24h
- 9 of 37 patients initiated OMC as first line therapy
- Dosing used for pulmonary NTM was consistent with other diagnoses but without loading doses.
- 10 of 37 (27%) received concomitant IVAB
- Overall, 20 pts (54%) received OMC via elastomeric devices for self-administration at home, 17 (46%) received OMC via pump through in-office infusion

OMC Therapy

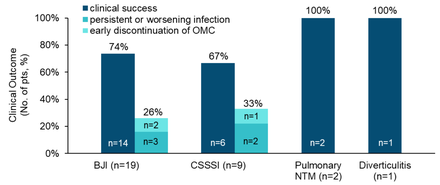
Fig. 3. Median Duration of OMC Therapy by Diagnosis



- Median length of OMC for BJI, cSSSI and diverticulitis were 39 days (IQR, 18-42), 21 days (IQR, 19-37), and 27 days, respectively. Additionally, one cSSSI pt with a complicated mycobacterial infection received OMC for 30 weeks.
- OMC median duration for therapy of pulmonary NTM was 23 weeks (IQR, 7-49)
- Concomitant IV antimicrobials were used in 10 pts (27%) including 4 BJI, 3 cSSSI, and 3 pulmonary NTM

Clinical Outcome

Fig. 4. Outcome of OMC by Diagnosis



- Overall, 31 of 37 pts were evaluable for outcomes. Clinical success at completion of therapy was achieved in 74% (23 of 31). Six pts were non-evaluable for outcomes (4 BJI, 2 pulmonary NTM) due to 4 transfer of care, 1 unrelated death, and 1 treatment ongoing.
- Non-success was due to persistent or worsening infections in 5 pts (3 *MRSA*, 1 *Stenotrophomonas*, 1 mixed infection) leading to hospitalizations in 4. Additionally, 3 pts discontinued OMC (2 with compliance issues and 1 adverse event).
- 2 pts transitioned to oral OMC (1 BJI, 1 cSSSI), both successfully completing therapy

Safety

Table 3. Treatment-Related Adverse Events

Adverse Event (AE)	No. Pts (%)
Nausea	4 (11%)
Elevated liver enzymes	3 (8%)
Fatigue	2 (5%)
Yeast infection	2 (5%)
Headache	1 (3%)
GERD	1 (3%)
Vomiting	1 (3%)

- 14 AEs were documented in 10 pts, most commonly nausea (11%) and elevated liver enzymes (8%)
- One pt experienced an infusion-related AE (chest pain, shortness of breath) leading to discontinuation of OMC

Discussion

This multicenter study provides real-world data on clinical outcome and safety of intravenous OMC used in POICs for any diagnosis.

- 37 adult pts from 5 ID POICs with BJI, cSSSI, diverticulitis, and pulmonary NTM were successfully treated with OMC in the POIC.
- Obese and non-obese patients were successfully treated with standard doses of OMC. Further exploration of outcomes and tolerance of OMC in the obese population is warranted.
- Most patients received multiple antibiotics prior to OMC use. Transition to OMC occurred in the POIC for a majority of patients. This allowed monotherapy for complicated infections (except NTM) and streamlined treatment.
- OMC demonstrated efficacy against Gram-positive and Gram-negative pathogens frequently encountered in complicated BJI, cSSSI, intra-abdominal and NTM infections. Further exploration of additional pathogens for which OMC demonstrates efficacy is important.
- Loading doses were administered upon initiation of OMC in most patients and over half self-administered OMC at home via elastomeric devices.
- The median duration of OMC therapy was 23 weeks for NTM. OMC was well tolerated in this population and no pt required discontinuation of therapy for OMC-related adverse events.
- Overall clinical success at end of therapy was achieved in 74% of pts evaluable for outcome. By diagnosis, clinical success was documented in 74% with BJI, 67% with cSSSI, 100% with NTM and diverticulitis. Non-success was due to worsening infections in 16% (5 pts) and discontinuation in 10% (3 pts). Many of these pts had been unsuccessfully previously treated with alternate therapies.
- The most common AEs were gastrointestinal, followed by elevated liver enzymes, comparable to that reported in the clinical trials[2-4]
- Limitations: clinical outcome was assessed at the end of therapy, which may have resulted in higher success rates. The small sample size per diagnosis did not allow for statistical evaluation of predictors for non-success.
- Omadacycline is beneficial in highly complex patients with polymicrobial infections including resistant organisms.

Conclusion

This real-world study demonstrated successful outcomes and safe administration of intravenous OMC for the treatment of cSSSI and other complicated infections in the outpatient setting.

Continued research is warranted into the use of OMC in BJI, NTM and diverticulitis.

References

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QR Code

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