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Mycobacterium avium Complex (MAC) Pulmonary Infections Treated with Regimens Containing Omadacycline in a Veteran Population

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BACKGROUND

- Pulmonary *Mycobacterium avium* complex (MAC) infections have 5-year mortality rates up to 27%[1]
- 12-month culture conversion rates achieved in 60% of patients[2]
- MAC guidelines recommend prolonged therapy with ≥3 active antimicrobials; however, treatment is limited by resistance, and adverse events occur in up to 70% of patients[2,3]
- Omadacycline (OMC) is a highly tolerable tetracycline available orally and is FDA approved for community acquired bacterial pneumonia and acute bacterial skin and skin structure infections[3]
- Clinical and *in vitro* activity have been previously described against non-tuberculosis mycobacterium infections, however activity against MAC has been demonstrated only in hollow fiber and murine models[4,5]

AIMS

Describe real-world usage and clinical outcomes of Veterans Affairs (VA) patients with pulmonary MAC infections treated with OMC as part of an antibiotic regimen

METHODS

- Retrospective, national chart review of patients admitted within the Veterans Health Administration from 10/2/2018 to 3/24/2026
- Inclusion criteria: diagnosis of MAC pulmonary disease with ≥1 positive sputum/acid-fast bacilli culture and omadacycline usage for treatment
- Outcomes and definitions:
  - All-cause mortality: death from any cause
  - Culture negativity: ≥1 negative follow-up culture
    - Sustained culture negativity: follow-up cultures were negative for MAC for 6 months and 12 months
  - Culture conversion: ≥2 negative sputum cultures ≥1 month apart
  - MAC relapse: culture positive with MAC after culture conversion
  - Clinical improvement: improvement of signs and symptoms of MAC pulmonary infections (i.e. cough, sputum production)
  - Refractory disease (based on IDSA 2020 guidelines): sputum culture positive after 6 months of guideline-based therapy

RESULTS

Table 1. Baseline characteristics of patients with MAC pulmonary disease treated with omadacycline (N=8)

Male gender, no. (%)	8 (100)
Age (years), median (IQR)	78 (76-81)
Race, no. (%)	
White	5 (62.5)
Black/African American	2 (25.0)
Unknown	1 (12.5)
Charlson Comorbidity Index, median (IQR)	7 (6-12)
Comorbidities, no. (%)	
Chronic obstructive pulmonary disease	6 (75.0)
Lung cancer	4 (50.0)
History of mycobacterium infections	3 (37.5)
Oxygen dependence, no. (%)	1 (12.5)

Table 2. Microbiologic and disease characteristics of MAC pulmonary disease treated with omadacycline (N=9*)

Disease severity, no. (%)	
Nodular	6 (66.7)
Cavitary	3 (33.3)
Refractory	2 (22.2)
Duration of MAC culture positivity (days), median (IQR)	350 (235-367)
Co-infecting mycobacterial species, no. (%)	
Mycobacterium abscessus	3 (33.3)
Mycobacterium terrae	1 (11.1)
MIC_{50}/MIC_{90} (µg/mL)	
Amikacin	16/32
Clarithromycin	2/8
Doxycycline[a,]	>8/>8
Minocycline[a]	>8/>8
Rifabutin[a]	0.25/1
Rifampin[a]	>4/>4
Clarithromycin-resistant, no. (%)	1 (11.1)
Amikacin resistance, no. (%)	
Intermediate	2 (22.2)
Resistant	1 (11.1)

*one patient with MAC recurrence required additional omadacycline course
[a]no CLSI breakpoint established; missing susceptibility data on 1 isolate (N=8)

Table 3. Treatment characteristics of MAC pulmonary disease treated with omadacycline (N=9*)

Treatment duration (days), median (IQR), N=8[a]	
Total treatment	404 (326-494)
Omadacycline treatment	347 (291-408)
Reason for omadacycline switch, no. (%)	
Oral switch	3 (33.3)
Resistance	2 (22.2)
Toxicity	3 (33.3)
Treatment failure	1 (11.1)

*one patient with MAC recurrence requiring additional omadacycline course
[a]one patient still undergoing MAC treatment

Table 4. Clinical outcomes of MAC pulmonary disease treated with omadacycline (N=9*)

Culture negativity, no. (%)	9 (100)
Sustained ×6 months, N=8[a]	7 (87.5)
Sustained ×12 months, N=7[b]	4 (57.1)
Culture conversion, no. (%), N=8[a]	7 (87.5)
MAC relapse, no. (%), N=7[c]	1 (14.3)
Clinical improvement, no. (%)	5 (55.6)
Radiologic outcomes, no. (%)	
Improved	3 (33.3)
Stable	4 (44.4)
Worsened	2 (22.2)
All-cause mortality, no. (%)	2 (22.2)

*one patient had MAC recurrence requiring additional omadacycline course
[a]one patient died before follow-up cultures obtained
[b]two patients died before follow-up cultures; one patient not reached 1-year endpoint
[c]three patients unevaluable as culture conversion never achieved

Figure 1. Antibiotic regimen received prior to omadacycline (N=9)

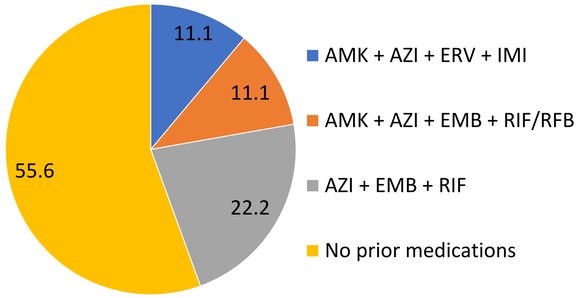
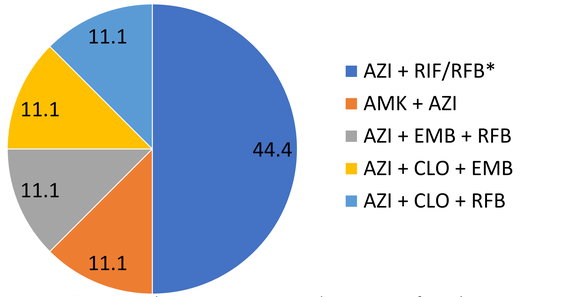


Figure 2. Antibiotics used in combination with omadacycline (N=9)



*EMB not given in 3 patients due to prior toxicity and one patient for unknown reason
Abbreviations: AZI, azithromycin; AMK, amikacin; CLO, clofazimine; EMB, ethambutol; RFB, rifabutin; RIF, rifampin; IMI, imipenem

CONCLUSIONS

Omadacycline may be an alternative antibiotic part of combination **against MAC pulmonary disease** and warrants further investigation

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