

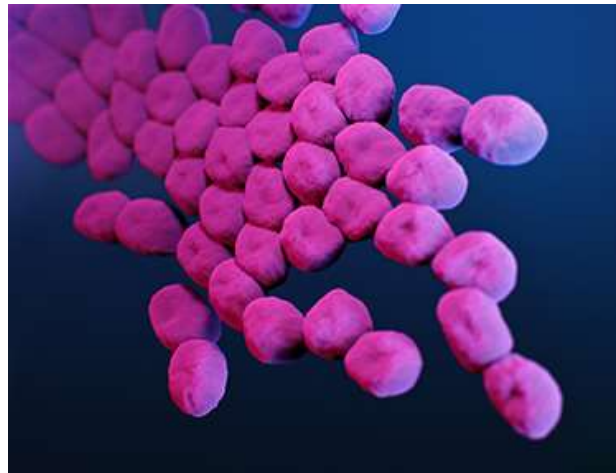
Combination Eravacycline Therapy for Carbapenem-Resistant *Acinetobacter baumannii* Pneumonia

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Gram-negative
coccobacilli



- Soil
- Water
- Human skin
- Environmental contamination

Environmental
Sources



- A. calcoaceticus/baumannii* complex**

Infection Type	Number of Organisms by Geographic Region (%)				
	North America	Asia-Pacific	Latin America	Europe	Total
Pneumonia in hospitalized patients	1460 (41.4)	1271 (54.6)	1297 (38.5)	1867 (41.2)	5895 (42.9)
Bloodstream	1176 (33.3)	594 (25.5)	1548 (46.0)	1805 (39.8)	5123 (37.3)
Skin & Skin Structure	620 (17.6)	422 (18.1)	476 (14.1)	657 (14.5)	2175 (15.8)
Urinary tract	174 (4.9)	37 (1.6)	32 (1.0)	131 (2.9)	374 (2.7)
Intra-abdominal	32 (0.9)	1 (0.04)	0 (0)	53 (1.2)	86 (0.6)
Others	65 (1.8)	2 (0.09)	14 (0.4)	18 (0.4)	99 (0.7)





Efflux pump
expression

AmpC
production

Porin alteration

Carbapenemase
production





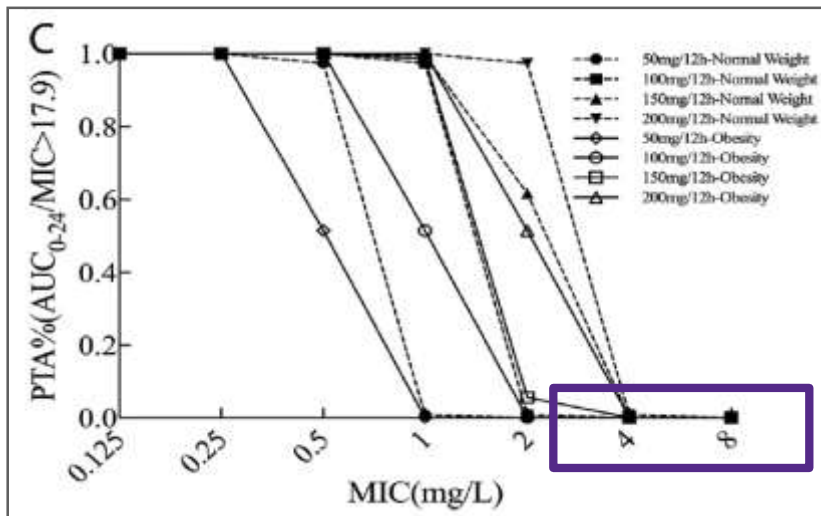
- **Greater *in vitro* potency compared to other tetracycline analogs**

	<i>All A. baumannii</i>		<i>MDR A. baumannii</i>	
	MIC ₅₀	MIC ₉₀	MIC ₅₀	MIC ₉₀
Minocycline (N = 1598/1130)	2	16	4	16
Tigecycline (N = 2097/1502)	2	4	4	8
Eravacycline (N = 2097/1502)	0.5	1	0.5	2



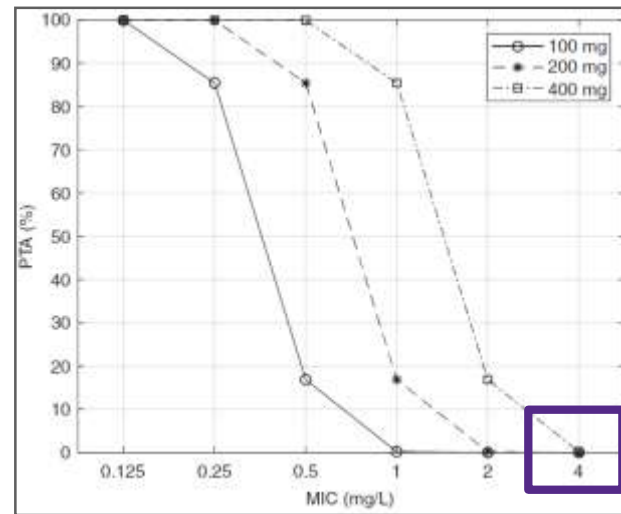


Tigecycline



MDR <i>A. baumannii</i>	
MIC ₅₀	MIC ₉₀
4 mg/L	8 mg/L

Minocycline



MDR <i>A. baumannii</i>	
MIC ₅₀	MIC ₉₀
4 mg/L	16 mg/L



Study Design

- Retrospective case series at large county hospital between April 1 to Oct 1st, 2020

Objective

- Describe the use of combination eravacycline therapy of the treatment of carbapenem resistant *A. baumannii* (CRAB) pneumonia in critically ill SARS-CoV-2 patients

Inclusion Criteria

- Receipt of ≥ 1 dose of eravacycline
- Diagnosed with SARS-CoV-2
- Respiratory culture positive for CRAB leading to physician-documented diagnosis of pneumonia

Exclusion Criteria

- CRAB bacteremia



Primary Outcomes

Microbiological resolution of CRAB

- Repeat sputum cultures obtained and negative for CRAB

Clinical resolution of CRAB pneumonia

- Alive \geq 48 hrs after end of therapy AND \geq 1 of the following:
 - \leq 14 days of therapy
 - Therapy not restarted within 48 hours after completion
 - Decrease in oxygen or pressor requirements from beginning to end of therapy

Secondary Outcomes

Frequency of patients requiring \geq 14 days of therapy

Frequency of patients re-initiating therapy within 48 hours after completion of therapy



Characteristic	N = 26
Age, median (range)	53 (33 – 77)
Male sex, n (%)	16 (61.5)
Body mass index (BMI), n (%)	
Overweight (BMI: 25.0 – 29.9)	6 (23.1)
Class 1 obesity (BMI: 30.0 – 34.9)	8 (30.8)
Class 2 obesity (BMI: 35.0 – 39.9)	4 (15.4)
Severe obesity (BMI: \geq 40.0)	8 (30.8)



Characteristic	N = 26
Pertinent comorbidities, n (%)	
Hypertension	17 (65.4)
Diabetes mellitus	15 (57.7)
Chronic kidney disease	2 (7.7)
Recent immunosuppressive therapy	2 (7.7)
Chronic liver disease	1 (3.8)
Chronic lung disease	1 (3.8)
Hematologic malignancy	1 (3.8)
HIV/AIDS (CD4 count < 200 cells/ μ L)	0 (0)
Neutropenia (ANC < 500 cells/ μ L)	0 (0)



Table 2: In-vitro susceptibilities for CRAB isolates

Antibiotic	Susceptibility rate, n (%)			
	Susceptible	Intermediate	Resistant	Not reported
Ampicillin-sulbactam	15 (57.7)	9 (34.6)	1 (3.8)	1 (3.8)
Colistin	---	20 (76.9)	1 (3.8)	5 (19.2)
Cefepime	0 (0)	1 (3.8)	18 (69.2)	7 (26.9)
Meropenem	0 (0)	0 (0)	25 (96.1)	1 (3.8)
Ciprofloxacin	0 (0)	0 (0)	25 (96.1)	1 (3.8)
Gentamicin	0 (0)	0 (0)	25 (96.1)	1 (3.8)
Tobramycin	0 (0)	0 (0)	25 (96.1)	1 (3.8)
Trimethoprim-sulfamethoxazole	0 (0)	0 (0)	25 (96.1)	1 (3.8)

Table 3: Tigecycline Minimum Inhibitory Concentration (MIC)

MIC	0.25	0.5	1	Not reported
Number of isolates, n (%)	12 (46.2)	8 (31)	0 (0)	6 (23.1)



Definitive Combination Therapy, n (%)	N = 26
Eravacycline + ampicillin-sulbactam	18 (69.2)
Eravacycline + inhaled colistin	1 (3.8)
Eravacycline + ampicillin-sulbactam + inhaled colistin	7 (26.9)

Characteristic	N = 26
Time from culture collection to definitive therapy (days), median (range)	2.5 (0 – 8)
Duration of combination therapy (days), median (range)	7.5 (4 – 27)



Primary Outcomes

Microbiological resolution*, n (%)	13/18 (72.2)
Clinical resolution**, n (%)	19/26 (73.1)

*Repeat cultures obtained and negative for CRAB

**Alive \geq 48 hours after end of therapy AND one of the following: < 14 days of therapy, therapy not restarted within 48 hours after completion, or decrease in oxygen requirements

Secondary Outcomes**N = 26**

Required > 14 days of therapy, n (%)	1 (3.8)
Restarted therapy within 48 hours after completion	0



Co-infection
with SARS-
CoV-2

Retrospective
design

Small sample
size





Eravacycline showed favorable microbiological and clinical outcomes

Eravacycline can be considered as salvage therapy for the treatment of CRAB pneumonia

Further studies needed to determine the efficacy of eravacycline for the treatment of CRAB pneumonia compared to other salvage therapies



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