Real-World Use of Eravacycline: A Case Series

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BACKGROUND/OBJECTIVE

- One of the newest additions to the tetracycline class of antibiotics is eravacycline, with a FDA approval for the treatment of complicated intra-abdominal infection.[1]
- Eravacycline has potent in vitro activity against resistant organisms including, Methicillin-Resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), Non-Tuberculous *Mycobacterium* (NTM), extended-spectrum β-lactamase (ESBL)- and carbapenem-resistant *Enterobacteriaceae* (CRE) and carbapenem- resistant *Acinetobacter baumannii* (CRAB).[2,3]
- Real-World data are limited with use of this agent in resistant infections.
- The aim of this study was to characterize the use of eravacycline at a large academic medical center.

METHODS

- Patients who received at least one dose of eravacycline were identified between October 2018 and July 2019 at the UCHealth.
- Patient demographic, infection, antimicrobial, and outcome data were collected from the electronic medical record.

RESULTS

- Eight patients received eravacycline for a mean duration of
- Most common types of infection included musculoskeletal (3/8), intra-abdominal (4/8) and pulmonary (1/8)
- Organisms being treated included polymicrobial (2/8), VRE (2/8), CRE (2/8), CRAB (1/8), methicillin-susceptible *Staphylococcus aureus* (2/8) and NTM (2/8).
- Three of the eight patients experienced adverse drug reactions including nausea (3/8) and transaminitis (1/8)

DISCUSSION

- Patients with multi-drug resistant infections have a relatively poor prognosis, where there are inadequate medical or surgical treatment options available.
- This case series highlights the use of eravacycline in patients with multiple complex comorbidities against these types of infections due to organisms including CRE, Carbapenem-resistant *A. baumannii*, and *M. abscessus.*
- Of the three patients who did not achieve successful clearance of the primary infection with the use of eravacycline; two of them were treated for Non-Tuberculous *Mycobacterium* infection.
- These two cases experienced adverse reactions, most notably nausea, leading to drug discontinuation.
- However, their treatment durations were 20- and 30-days which was beyond the 14-day maximum seen in the IGNITE-4 clinical trial.[4]

RESULTS

Case	Pathogen(s)	Infection Site	Other Antimicrobials	ERV Duration (days)	ERV Dose	Adverse Drug Reaction	Notes	Clinical Outcome	Infection-related mortality
1	Escherichia coli, Klebsiella aerogenes, Vancomycin-resistant Enterococcus faecalis, Clostridiidioides difficile	Polymicrobial bacteremia secondary to ascending cholangitis vs. typhlitis, diarrhea	Piperacillin-tazobactam^{P} Vancomycin IV^{C,P}, vancomycin PO^{C,P}, meropenem^{C,P}, metronidazole^{C,P,}	4	1 mg/kg q12h x 2 doses, then 1 mg/kg q24h	None	Daily dosing due to hepatic impairment	Clearance of bacteremia	No
2	Carbapenem resistant Acinetobacter baumamnii, Klebsiella oxytoca, ceftriaxone-resistant Proteus mirabalis	Polymicrobial bacteremia secondary to severe soft tissue infection	Piperacillin-tazobactam^{P}, vancomycin^{P} ,meropenem^{C,P}, ampicillin-sulbactam^{C,P},	9	1 mg/kg q12h	None		Clearance of bacteremia	No
3	KPC-producing Klebsiella oxytoca	Bacteremia secondary to peritonitis	Cefepime^{P}, vancomycin^{P}, metronidazole^{P}, meropenem^{P}, ceftazidime-avibactam^{C,P}, aztreonam^{C,P}	29, 27	1 mg/kg q12h	Nausea	Added due to growth of K. oxytoca in abdomen despite ceftazidime-avibactam treatment, eventual development of resistance to ceftazidime-avibactam	Clearance of bacteremia, Clinical cure of peritonitis	No
4	EBSL-producing Escherichia coli, Pseudomonas aeruginosa, methicillin-susceptible Staphylococcus aureus, Vancomycin-resistant Enterococcus faecium	Vertebral osteomyelitis	Vancomycin IV^{P}, vancomycin PO^{P}, meropenem^{P}, daptomycin^{P}, ertapenem^{P}, linezolid^{P}, tedizolid^{P}	5	1 mg/kg q12h	None	Eravacycline discontinued due to increasing leukocytosis and C-Reactive Protein	Discontinuation due to need for additional antipseudomonal spectrum	No
5	Methicillin-susceptible Staphylococcus aureus, history of Vancomycin- resistant Enterococcus faecium, history of carbapenem-resistant Klebsiella pneumoniae	Peri-rectal abscess, peritonitis	Ceftazidime-avibactam^{P}, metronidazole^{P}, daptomycin^{P}, cefazolin^{c}	25	1 mg/kg q12h	None		Resolution of infection	No
6	Carbapenem-resistant Klebsiella pneumoniae	Bacteremia secondary to gastrointestinal translocation vs PICC line	Ceftazidime-avibactam^{P}, ciprofloxacin^{P}, meropenem-vaborbactam^{P}, tobramycin^{C},	9	1.5 mg/kg q12h	None	Immediate hypersensitivity to ceftazidime-avibactam; limited supply of meropenem-vaborbactam, higher dosing due to concurrent primidone	Clearance of bacteremia	No
7	Mycobacterium abscessus subsp. massilense	Hardware associated lumbar wound infection	Imipenem^{PC}, IV amikacin^{P}, bedaquiline^{PC}, clofazimine^{PC}, azithromycin^{PC},	30	1 mg/kg q12h, 1.25 mg/kg q24h	Nausea, edema, elevated liver transaminases	Previous drug-induced hepatitis with tigecycline, Dosing changed to daily in attempt to reduce ADRs	Unresolved Infection	No
8	Mycobacterium abscessus subsp. abscessus	Pulmonary Infection	Clofazimine^{P}, bedaquiline^{P}, azithromycin^{P}, inhaled amikacin^{C}, Imipenem^{P,C} IV amikacin^{P,C} tedizolid^{C,P}	20	1 mg/kg q12h	Nausea		Unresolved Infection	Yes

CONCLUSIONS

Eravacycline resulted in successful clearance of the primary infection in five of the eight patients. Future studies are needed to further elucidate the role of eravacycline in the clinical setting. Specifically, dose optimization to improve tolerability during extended treatment durations while maintaining efficacy, and against multi-drug resistant organisms including Mycobacterium abscessus.

REFERENCES/ DISCLOSURES

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Gerard Barber has served on the Tetraphase Speakers bureau. All other authors have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

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