

Session: P058 New data on new tetracyclines

**Category: 5c. New antibacterial agents: clinical trials**

24 April 2017, 12:30 - 13:30  
P1261

**Antibacterial activity of Eravacycline, a novel fluorocycline, compared to established antimicrobials, against contemporary clinical isolates from Tanta, Egypt**

Maisra El-Bouseary\*<sup>1</sup>, Jonathan Tyrrell<sup>2</sup>, Timothy R. Walsh<sup>3</sup>, Melanie Olesky<sup>4</sup>

<sup>1</sup>Cardiff University, School of Medicine; Medical Microbiology

<sup>2</sup>Cardiff University; <sup>3</sup>department of Medical Microbiology & Infectious Diseases

<sup>3</sup>Infection and Immunity, School of Medicine, Cardiff University

<sup>4</sup>Tetraphase Pharmaceuticals; Medical Affairs

**Background:** Infections caused by multidrug-resistant (MDR) and drug-resistant (XDR) Gram-negative bacteria are a serious global public health concern and remain a driving force for antibiotic drug discovery efforts. Eravacycline (ERV, Tetraphase Pharmaceuticals) is a novel, fully-synthetic fluorocycline antibacterial drug that retains activity against the primary acquired mechanisms of resistance against tetracycline-class antibiotics (i.e., efflux and ribosomal protection). Herein we evaluate the *in vitro* antimicrobial activity of ERV against clinical Gram-negative pathogens, including *Enterobacteriaceae*, *Pseudomonas* spp., and *Acinetobacter* spp., from hospitalized patients in Tanta, Egypt.

**Material/methods:** A total of 410 clinical isolates, *Enterobacteriaceae* (n=327) and *Non-Enterobacteriaceae* (n=83), were recovered from different clinical samples including blood, urine, sputum, skin swab and ear swab, collected from patients admitted to Tanta Teaching hospital, Egypt. Recovered isolates were identified to the species level by MALDI-TOF. Genes encoding carbapenemases were detected via PCR. MICs for ERV and selected comparator antibiotics (Table 1) were determined using microbroth dilution assays in pre-prepared microtitre plates. Results were interpreted using EUCAST guidelines.

**Results:** Isolates tested were: *Klebsiella pneumoniae* (n=123), *E. coli* (n=83), *Providencia* spp. (n=52), *Enterobacter* spp. (n=19), *Proteus* spp. (n=23), *Pseudomonas* spp. (n=67), *Acinetobacter* spp. (n=16), and a miscellaneous group (n=27). Genes encoding carbapenemases were: *bla*<sub>NDM</sub>-positive (33.5%), *bla*<sub>VIM</sub>-positive (20%) *bla*<sub>OXA-48</sub>-positive (7%) other MBL (39%). MIC<sub>90</sub>s of all comparator

antibiotics against both *Enterobacteriaceae* and *Non-Enterobacteriaceae* were above resistance breakpoints as defined by EUCAST. ERV recorded MIC<sub>50</sub> and MIC<sub>90</sub> of 1µg/ml and 8µg/ml against *Enterobacteriaceae*; favourable to all antibiotics tested (Table 1). In the case of *Non-Enterobacteriaceae*, ERV showed a MIC<sub>50/90</sub> values of 0.125/8 µg/ml against *Acinetobacter* spp. and 16/32 µg/ml against *Pseudomonas* spp

**Conclusions:** Eravacycline showed a valuable *in vitro* antimicrobial activity against tested MDR/XDR Gram-negative organisms which is demonstrated by the lowest MIC<sub>50</sub>s and MIC<sub>90</sub>s values. ERV may be a potential option for the management of multidrug-resistant organisms.

Antibiotic	Entero		Acinetobacter		Antibiotic	Entero		Acinetobacter	
	MIC <sub>50</sub>	MIC <sub>90</sub>	MIC <sub>50</sub>	MIC <sub>90</sub>		MIC <sub>50</sub>	MIC <sub>90</sub>	MIC <sub>50</sub>	MIC <sub>90</sub>
<b>Eravacycline</b>	1	8	0.125	8	<b>Pip/Tazo</b>	>64	>64	128	>128
<b>Cefepime</b>	>8	>8	8	>16	<b>Tetracycline</b>	>8	>8	>8	>8
<b>Ceftazidime</b>	>8	>8	32	>32	<b>Tigecycline</b>	4	8	2	16
<b>Cefotaxime</b>	>2	>2	-	-	<b>Minocycline</b>	-	-	0.25	>16
<b>Colistin</b>	0.5	>2	1	>4	<b>Meropenem</b>	-	-	4	>16
<b>Gentamicin</b>	>8	>8	-	-	<b>Amikacin</b>	-	-	1	>32
<b>Ertapenem</b>	>2	>2	-	-	<b>Trim/Sulf</b>	-	-	>32/608	>32/608
<b>Levofloxacin</b>	>2	>2	0.5	8					

Table 1: MIC<sub>50</sub> & MIC<sub>90</sub> of *Enterobacteriaceae* (n=327) and *Acinetobacter* (n=16) against Eravacycline and comparator antimicrobials.