Eradication in vivo activity against clinical isolates obtained in the United States during 2016 from urinary and gastrointestinal sources, including drug resistant pathogens
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**Introduction**

Eravacycline is a novel, fully-synthetic fluorocycline antibiotic that has completed phase 3 clinical development for patients with complicated intra-abdominal infections (cIAI) and is under regulatory review by the Food and Drug Administration and European Medicines Agency. Eravacycline has potent in vitro activity against a broad range of susceptible and multidrug-resistant (MDR) Gram-positive and Gram-negative aerobic and anerobic systemic infections (including Staphylococcus aureus, Enterococcus faecalis, Enterococcus faecium, Streptococcus pneumoniae, Escherichia coli, Klebsiella pneumoniae, Achromobacter baumannii and Pseudomonas spp. It remains active against the most common tetracycline-specific acquired resistance mechanisms (i.e., efflux and ribosomal protection)1,2.

The purpose of the study was to evaluate the activity of eravacycline and comparators against clinical isolates in the United States from gastrointestinal (GI) and genitourinary (GU) sources collected during 2016 as part of a global surveillance study of eravacycline conducted by International Health Management Associates (IHMA) and sponsored by Tetraphase Pharmaceuticals.

**Methods and Materials**

- Clinical isolates were collected during 2016; 482 from GI and 715 from GU infections.
- Minimum inhibitory concentration (MIC) values were determined for eravacycline and comparators by CLSI broth microdilution methodology3, with susceptibility evaluated according to CLSI 2016 M100 guidelines, or FDA, when no CLSI breakpoint was available.
- Quality control testing was performed each day of testing as specified by the CLSI using Escherichia coli ATCC 25922, E. coli ATCC 35218, Klebsiella pneumoniae ATCC 700603, Pseudomonas aeruginosa ATCC 27853, E. faecalis ATCC 29212 and S. aureus ATCC 29213.
- Multidrug-resistant (MDR) was defined as resistance to ≥3 drugs from the following: amikacin, cephalosporin, ceftazidime, ceftriaxone (or any one), carbapenem (ertapenem or meropenem), gentamicin, levofloxacin, piperacillin/tazobactam, tigecycline, or tetracycline.

**Results**

- Susceptibility data, MIC<sub>50</sub> values, and MIC ranges for eravacycline and comparators are shown in Tables 1 and 2.
- Eravacycline demonstrated potent activity against Enterobacteriaceae, in GI and GU isolates, with MIC<sub>50</sub> values of ≤1 mg/L (Table 2).
- E. coli and K. pneumoniae were the two most common bacterial pathogens isolated from GI and GU sources. Amikacin, colistin and carbapenem (meropenem and ertapenem) demonstrated the highest rates of susceptibility ranging from of 95.5 -100% and 98.4 -100% for K. pneumoniae and E. coli, respectively.
- Eravacycline was up to 8-fold more potent than tigecycline versus E. coli and K. pneumonia (Table 2).
- Against Enterobacter cloacae, only the aminoglycosides, colistin and meropenem maintained high rates of susceptibility of ≥95%.
- Tigecycline demonstrated 91.4-100% susceptibility versus E. cloacae. The MIC<sub>50</sub> of eravacycline against E. cloacae was 2-fold lower than tigecycline (Table 2).
- Eravacycline MIC<sub>50</sub> values were up to 8-fold lower than tigecycline against E. faecalis and E. faecium, and 2-fold lower against MSPA and Streptococcus agalactiae (Table 1).

**Conclusions**

- Eravacycline demonstrated potent in vitro activity against a variety of clinically important Gram-negative and Gram-positive organisms from GI and GU sources, including MDR isolates.

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References:


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