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Activity of Eravacycline against North American and European Enterobacteriaceae, Including Multidrug-Resistant Isolates, Collected in 2013-14

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Background: Eravacycline is a novel fully synthetic fluorinated analog of the tetracyclines with a novel mode of action. The agent has demonstrated broad Gram-negative activity and is active against multidrug-resistant isolates. The drug has entered Phase 3 clinical trials for the treatment of complicated urinary tract infection (cUTI) and complicated intra-abdominal infections (cIAI) in adults and was recently approved for the treatment of cUTI and cIAI caused by enterobacterial Gram-negative pathogens by the FDA. This study assessed the activity of eravacycline against a collection of recent Enterobacteriaceae collected from North America and Europe.

Methods and Materials: A total of 4,462 Enterobacteriaceae clinical isolates (subtracted from 2013-2014) were tested. The isolates were assessed for resistance to ciprofloxacin, tigecycline, eravacycline, imipenem, and colistin. The MICs were reported as £0.5 µg/ml or £1.0 µg/ml. Allowing these breakpoints, a standard CLSI MIC value of £0.5 µg/ml was used as the definition of susceptible. A total of 4,110 isolates were tested for eravacycline. The isolates were screened for extended-spectrum beta-lactamase (ESBL) and AmpC producers using the CLSI protocol. In addition, E. coli and K. pneumoniae isolates were screened for the presence of mcr-1. The isolates were further subtyped with pulsed-field gel electrophoresis (PFGE) analysis and Multilocus Sequence Typing (MLST).

Results: A comparison of ratio of tigecycline versus eravacycline MIC is shown in Figure 1. There was a statistically significant difference between eravacycline and tigecycline among North American and European isolates. A breakdown of the 4,462 isolates by geographical region and species is shown in Table 1. Table 2 shows the MIC results for eravacycline against all Enterobacteriaceae (n = 4,462) and MDR Enterobacteriaceae (n=58). Table 3 displays the MIC results for eravacycline against all Enterobacteriaceae (n = 4,462) and MDR isolates from Europe and the USA. Table 4 displays the MIC results for eravacycline against all Enterobacte