**ABSTRACT**

**Background:** Omadacycline (OMC) is a new once daily oral and IV antimicrobial under phase 3 clinical development for the treatment of serious community-acquired skin and respiratory infections. To better understand the pharmacodynamic activity of OMC and compare it to currently available agents, an in vitro study was conducted. Omadacycline (OMC), linezolid (LZD), and tigecycline (TIG) were evaluated against target pathogens.

**Methods:** MICs of OMC, TIG, and LZD were determined in accordance with CLSI document M7. MICs were determined against clinical isolates of S. aureus (n=2; 1 MRSA, 1 PRSA), E. faecium (n=2), E. faecalis (n=3), S. pneumoniae (n=2; 1 penicillin-susceptible, 1 penicillin-resistant [PRP]), and GABHS (n=1) in Mueller-Hinton broth. Sensitivity results were confirmed with disc diffusion. A parenteral vehicle in broth (0.15% NaCl, 0.02% Na2EDTA, pH 7.0) was added to each isolate to obtain final concentrations of 1.25–5× the MIC of OMC, TIG, and LZD. The MIC was determined after initial exposure of log phase bacteria to 5× the MIC of OMC, TIG, or LZD for 1 hr as an uncontrolled control. Post-exposure, the drug was removed by making a 1:1000 dilution into fresh antibiotic-free broth, and the bacteria were incubated for an additional 24 hr to assess PAEs. Viable bacteria recovered over time were assessed by plating 10-fold serial dilutions on antibiotic-free agar. PAEs were calculated as the time it took for viable bacteria to grow 1 log unit past the time of antibiotic exposure minus the time for 1 log unit regrowth of the growth control (GC) and extrapolated from the viable bacteria recovered over time. Simultaneous control experiments were conducted with culture media (0.15% NaCl, 0.02% Na2EDTA, pH 7.0) and E. coli (ORF-1) to 5× the MIC of OMC, TIG, and LZD (PAEs between 1.4–5.0 hr – 2.5) across isolates except for enterococci where slightly longer PAEs were observed with TIG (PAEs between 1.0 and 2.2 hr – 2.5) across isolates except for enterococci where the TIG PAE was slightly longer (3.8 hr – 4.4). MIC values were determined by broth microdilution in accordance with CLSI guidelines.**

**RESULTS**

**Table 1** shows the MIC (µg/mL) of OMC, TIG, and LZD for the evaluated isolates.

**Figures 1–4** show viable bacteria recovered over time after initial exposure of S. aureus (Fig. 1A), E. faecalis (Fig. 2A), E. faecium (Fig. 3A), and E. coli (Fig. 4A) to 5× the MIC of OMC, TIG, and LZD. The time for 1 log unit regrowth post-exposure and removal minus the time for 1 log unit regrowth of the growth control (GC) were extrapolated from the viable bacteria recovered over time.

**CONCLUSIONS**

Overall, the PAE of OMC was similar to that of TIG and LZD. Both omadacycline and tigecycline exhibited a longer PAA relative to linezolid. Though the clinical relevance of the PAE observed with omadacycline and tigecycline is unknown, the prolonged activity of omadacycline and tigecycline may provide a benefit in the treatment of serious community-acquired infections.

**References**


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