Background: Meropenem-vaborbactam is a new carbapenem-beta-lactamase inhibitor combination designed to treat infections caused by carbapenem-resistant enterobacteriaceae. This study compared the efficacy and tolerability of meropenem-vaborbactam (M-V) versus piperacillin-tazobactam (P-T) in adult patients with complicated urinary tract infections (cUTI) or acute pyelonephritis (AP) in the intensive care unit (ICU).

Methods: This was a Phase 3, multicenter, double-blind, double-dummy, randomized, parallel-group study of M-V vs P-T for adults with cUTI or AP. Patients ≥18 years of age who had a positive urine culture with ≥1 isolate and a clinical diagnosis of cUTI or AP were considered eligible. Primary endpoint was microbiological modified intent-to-treat population (m-MITT) clinical cure rate at end of IV therapy (EOIVT) and test of cure (TOC).

Results: Of 541 patients enrolled in the m-MITT population, 270 (50%) were randomized to M-V and 271 (50%) to P-T. In the m-MITT population, 94% of patients treated with M-V and 95% with P-T had baseline gram-negative bacteria. Patients with Enterobacteriaceae were more likely to be randomized to M-V (42%) than to P-T (36%). In the m-MITT population, 94% of patients treated with M-V and 95% with P-T had baseline gram-negative bacteria. Patients with Enterobacteriaceae were more likely to be randomized to M-V (42%) than to P-T (36%). In the m-MITT population, most patients in the M-V (97.8%) and P-T (97.8%) groups were already hospitalized at study enrollment; 9.9% of patients in both groups were transferred to the ICU during the study period. The LOS range was 1 to 13 days in the M-V group and 6 to 16 days in the P-T group. On average, total ICU LOS was shorter for the M-V group by 1.8 days compared with the P-T group (P = 0.0002). The Kaplan-Meier plot in Figure 3 summarizes the ICU discharge rate over time for both the M-V and P-T groups. Clinical cure rates were numerically higher for M-V compared with P-T at EOIVT and TOC. These data support a positive benefit-risk profile for M-V for the treatment of serious gram-negative infections.

Conclusions: Among patients in the m-MITT group who were in the ICU at study baseline or who were transferred to the ICU during the study period, LOS was significantly shorter by approximately 2 days for patients treated with meropenem-vaborbactam compared with those treated with piperacillin-tazobactam.

Meropenem-vaborbactam is a promising alternative for treating serious gram-negative infections, particularly for patients in the ICU.