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**In vitro Activity of Tebipenem against Relevant Clinical Isolates in the Presence of Pulmonary Surfactant**

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**Introduction**

- Tebipenem is an orally administered broad-spectrum carbapenem antibiotic.
- Tebipenem has recently completed a Phase 3 clinical trial evaluating its safety and efficacy for the treatment of complicated urinary tract infection and acute pyelonephritis.
- The objective of this study was to evaluate the effect of bovine pulmonary surfactant (BPS) on the in vitro activity of tebipenem and ertapenem against a recent collection of clinical isolates to support the feasibility for tebipenem use in the treatment of bacterial pneumonia.

**Materials and Methods**

- In this study, 30 clinical isolates were recovered from patients with documented infections in 2018 as a part of the SENTRY Antimicrobial Surveillance Program. These isolates were sent to a central monitoring laboratory (JMI Laboratories, North Liberty, Iowa, USA) and included one isolate from each of the following species: *Enterococcus* spp., *Staphylococcus* spp., *Streptococcus* spp., *Escherichia coli*, *Klebsiella pneumoniae*, *Citrobacter freundii*, *Haemophilus influenzae*, *H. parainfluenzae*, *Streptococcus pyogenes*, *Streptococcus pneumoniae*, *S. aureus*.
- A recent collection of clinical isolates was purchased from the ATCC and included one isolate from each of the following species: *Citrobacter freundii*, *Klebsiella pneumoniae*, *Enterobacter cloacae*, *Staphylococcus* spp., *Streptococcus* spp., *Haemophilus parainfluenzae*.
- Bacterial species were identified by JMI Laboratories using standard microbiology methods and matrix-assisted laser desorption ionization-time of flight mass spectrometry (Bruker Daltronics, Bremen, Germany).
- Isolates were tested for antimicrobial susceptibility by the broth microdilution method in HTM media and in HTM media containing 1% BPS. The MIC values with BPS were compared to the MIC values without BPS to determine the percentage of isolates with a >2-fold shift toward lower potency in BPS.

**Results**

- Tebipenem was active against all isolates tested with MIC values ≤0.06 mg/L.
- The addition of BPS to the broth microdilution medium did not affect the in vitro MIC values of tebipenem or ertapenem against these species.
- As expected, the addition of BPS to the growth medium did not affect the in vitro MIC values of tebipenem or ertapenem against these species.

**Conclusions**

- Tebipenem was active against all isolates tested with MIC values ≤0.06 mg/L.
- The addition of BPS to the growth medium did not affect the in vitro MIC values of tebipenem or ertapenem against these species.
- As expected, the observed tebipenem MIC values of the 30 isolates ATCC 29213 strain in HTM containing 50 mg/L of calcium and 10–12.5 mg/L of magnesium were within the CLSI published range.
- As expected, the addition of BPS to the growth medium did not affect the in vitro MIC values of tebipenem or ertapenem against these species.

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