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JMI Laboratories, North Liberty, Iowa, USA

Introduction

- Inducible AmpC resistance is caused by the derepression of the chromosomal AmpC in the presence of a -lactam and limits the use of these agents to treat infections caused by Enterobacterales species known to produce these enzymes (AmpC producers).
- Novel -lactam/ -lactamase inhibitors (BL/BLIs), such as meropenem-vaborbactam, ceftazidime-avibactam, and imipenem-relebactam, display activity against isolates producing serine-carbapenemases, extended-spectrum -lactamases, and AmpC enzymes.
- In this study, we evaluated the activity of novel BL/BLIs against a collection of AmpC producers collected in US hospitals during 2021.

Materials and Methods

- A total of 1,252 organisms of Enterobacterales species known to overexpress AmpC enzymes were consecutively collected in 31 US hospitals during 2021.
  - AmpC-producing species included in this study are displayed in Figure 1.
  - Isolate frequency by infection source is displayed in Figure 2.
  - Only 1 isolate per patient episode was included.
- Isolates were susceptibility tested against meropenem-vaborbactam, ceftazidime-avibactam, and comparator agents using the reference broth microdilution method as described by the Clinical and Laboratory Standards Institute (CLSI) M07 (2018) document.
  - Vaborbactam was tested at a fixed concentration of 8 mg/L.
  - Avibactam and relebactam were tested at a fixed concentration of 4 mg/L.
- Quality control (QC) was performed according to the CLSI M100 (2022) criteria.
  - All QC MIC results were within acceptable ranges.
- Categorical interpretations for all comparator agents were those criteria found in the CLSI M100 (2022), or the US Food and Drug Administration (FDA) website.

Conclusions

- Infections caused by AmpC-producing species often are challenging to treat.
- Understanding the activity of new BL/BLIs is critical, as the use of cefepime and meropenem can lead to resistance.
- Meropenem-vaborbactam, imipenem-relebactam, and ceftazidime-avibactam displayed good activity against AmpC producers.
  - When analyzing carbapenem-nonsusceptible or cefepime-resistant isolates, meropenem-vaborbactam was slightly more active and also more potent than other BL/BLI combinations.

Funding

This study was supported by Melinta Therapeutics, Inc. Authors are employees of JMI

Acknowledgements

The authors thank all of the SENTRY Antimicrobial Surveillance Program participants for providing isolates.

Mariana Castanheira, PhD
JMI Laboratories
345 Beaver Kreek Centre, Suite A
North Liberty, IA 52317
mariana-castanheira@jmilabs.com

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