Updated on Potency and Spectrum of Activity of Meropenem and Selected Broad-Spectrum Agents: Testing Results from the USA MYSTIC Program (2006)

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**AMENDED ABSTRACT**

The carbapenems demonstrated the lowest resistance rates (2.3-4.0%) of all agents tested against Enterobacteriaceae isolates tested in the 2006 USA MYSTIC Program with carbapenem resistance observed among K. pneumoniae, spp. with documented KPC-carbapenemase production.

- A total of 57 Klebsiella spp. (5.2%) overall collected from two sites in New York City and one site each in New Jersey and Ohio were confirmed to possess a KPC carbapenemase using PCR methods with clinical breakpoints KPC-positive rates of 58.8, 26.3, and 2.4%, respectively (Table 1).

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- Confluent ESBL rates among E. coli and Klebsiella spp. isolates were similar to prior surveillance rate of 14.8% and 10.0% with the presence of FOX-5 and CTX-M-2 AmpC beta-lactamases confirmed in 53% of the ESBL-positive confirmatory test resistant strains. CTX-M-1 were identified in strains isolated from medical centers in New York (2), Utah (1), Iowa (1), and Washington (1). One isolate was confirmed in five E. coli strains isolated in New York and Louisiana (1). Four isolates were confirmed in five Klebsiella strains isolated in New York and Louisiana (1).

- All carbapenem-resistant Enterobacteriaceae isolates, except for the fluoroquinolones with only 88.6-90.4% susceptibility.

- High-level gentamicin resistance (>500 mg/L) was observed in 23.5% of E. coli isolates and fluoroquinolones resistance was 33.6%.

- Table 3 shows that levofloxacin was the most active agent in vitro against S. pneumoniae isolates with a 100.0% susceptibility rate. All three carbapenem tested had nearly identical MIC, MIC, and MIC result ranges, however, breakpoints used (CLSI) very widely from those used for respiratory tract enterococci (>90% susceptible, cephalosporins, enterococci, and levofloxacin) to very conservative lower breakpoints applied to meningococci (78.3% for meropenem).

- All agents tested were highly active (100.0%) against fluoroquinolone-resistant strains except for three fluoroquinolone resistant strains; one each from Hawaii, Kentucky, and Washington.

- While meropenem was high (MIC, 0.06-4.0 mg/L) and provided complete coverage (100% susceptible) against the collection of Gram-positive anaerobic G. stearothermophilus and Peptostreptococcus species tested in contrast, imipenem had a susceptibility rate of 86.5 against the Gastrostomy spp. isolates (Table 4).

**INTRODUCTION**

Antimicrobial surveillance activities can provide valuable information to clinicians about susceptibility and resistance rates of antimicrobial agents used for diagnosis or treatment of various infections in medical centers or in geographic regions. These data can help identify trends in increasing resistance rates and changes in patterns of antibiotic resistance among Enterobacteriaceae, Acinetobacter, and Pseudomonas isolated from severely ill patients.

The MYSTIC Study: Susceptibility Time Interval Collection: Collection MYSTIC Program is a permanent surveillance study that involves the analysis of antimicrobial susceptibility data on a fluid basis from a large sampling source from 100 participating medical centers. Standardized susceptibility data (susceptibility rates and resistance rates) are reported on an antimicrobial susceptibility testing results from the Mycotic Surveillance Program (US) isolates collected in 2006 from select agent-sensitive agents using standardized antimicrobial susceptibility testing.

**MATERIALS AND METHODS**


**RESULTS**

- Table 1: Antimicrobial activity of imipenem and other comparator agents tested against Enterobacteriaceae isolates in the USA MYSTIC Program (2006).

- Table 2: Antimicrobial activity of imipenem and other comparator agents tested against gram-positive cocci in the USA MYSTIC Program (2006).

- Table 3: Antimicrobial activity of imipenem and other comparator agents tested against Enterobacteriaceae isolates in the USA MYSTIC Program (2006).

- Table 4: Antimicrobial activity of imipenem and other comparator agents tested against Enterobacteriaceae isolates in the USA MYSTIC Program (2006).

- Table 5: Antimicrobial activity of imipenem and other comparator agents tested against gram-positive cocci in the USA MYSTIC Program (2006).

**CONCLUSIONS**

- Meropenem and imipenem demonstrated a similar potency and spectrum of activity as reported earlier (1999-2005) in MYSTIC Program surveillance results against E. coli, P. aeruginosa, oxacillin-susceptible staphylococci and E. faecalis isolates.

- The escalating incidence and widening geographic impact of KPC carbapenemase-producing Klebsiella spp. isolates is a critical clinical concern and should be monitored more closely.

- Continued surveillance of Gram-negative bacilli, oxacillin-susceptible staphylococci, and Gram-positive anaerobic species appears warranted to monitor for variations being documented among the carbapenems and other broad-spectrum agents.

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**SELECTED REFERENCES**

