Evaluation of SensiTest Colistin, a commercial broth microdilution-based method to evaluate colistin MICs for Klebsiella pneumoniae isolates

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Background: Colistin is often the last option to treat infections caused by multidrug-resistant microorganisms, such as carbapenemase producing K. pneumoniae. Antimicrobial susceptibility testing of colistin has been fraught with difficulties which resulted in the need for updated recommendations from CLSI and EUCAST. Both committees proposed that the ISO 20776-1-2016 standard broth microdilution (MBD) must be the preferred method for colistin MIC testing [CLSI-EUCAST Polymyxin Breakpoints Working Group. 2016]. The objective of our study was to evaluate the commercial SensiTest™ Colistin (Liofilchem® srl, Roseto degli Abruzzi, Italy), a compact panel containing the antibiotic in 7 two-fold dilutions (0.25-16mg/L), using frozen broth microdilution plates (according to CLSI) as reference.

Materials/methods: Colistin susceptibility testing was performed on a nationwide collection of 392 carbapenemase-producing K. pneumoniae isolates using BMD according to CLSI and SensiTest™ Colistin. SensiTest™ Colistin according to the manufacturers’ recommendations. Susceptibility test results were interpreted according to the EUCAST breakpoints (v. 7.1, 2017). Colistin was active in vitro against 251 K. pneumoniae isolates (64%) with an MIC range of 0.5->64mg/L and MIC50/90 of 1/64mg/L. Essential and categorical agreements were calculated according to ISO20776-2.

Results: SensiTest™ Colistin showed high levels of overall/evaluable essential (94.9% / 93.6%) and categorical agreement (97.2%), with Very Major Errors in 0.7% (1/141 Col-R) and met the current acceptance criteria proposed by CLSI. Ten Major Errors were observed (3.98%, 10/251 Col-S), three of which were within essential agreement (Figure).

Conclusions: SensiTest™ Colistin is a commercial BMD method that reliably determined colistin MICs in a large collection of carbapenemase-producing K. pneumoniae isolates.
Figure. Scattergram comparing SensiTest™ MICs with BMD MICs for colistin, tested against the 392 contemporary K. pneumoniae clinical isolates. The dashed line represents the EUCAST breakpoint for susceptibility (≤2 mg/L). Absolute agreement is indicated by bold. Shaded area indicates essential agreement. VMEs are indicated by red.