R2777

Abstract (publication only)

Evaluation of Liofilchem® MIC Test Strips (MTS) gradient-diffusion system for susceptibility testing of multiresistant Pseudomonas aeruginosa and Acinetobacter strains

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Objectives: Multidrug-resistant (MDR) Pseudomonas aeruginosa and Acinetobacter spp. are among the most important causes of nosocomial infections and represent particular challenges for antibiotic treatment. Because of limited treatment options, accurate determination of minimum inhibitory concentrations (MICs) of some antimicrobial agents against these pathogens is often critically important to guide the therapy. In this study we evaluated the performance of a new gradient-diffusion system for MIC determination of large number of P. aeruginosa and Acinetobacter isolates. Methods: 522 MDR clinical isolates (323 P. aeruginosa, 187 A. baumannii, 10 A. pittii, and 1 isolate each of A. calcoaceticus and A. haemolyticus) collected as part of surveillance study in 21 hospitals in 2011-2012 were studied. MICs of piperacillin-tazobactam, ceftazidime, cefepime, imipenem, meropenem, sulbactam, gentamicin, tobramycin, amikacin and ciprofloxacin were determined in parallel by MIC Test Strips (MTS) (Liofilchem, Italy) and by agar dilution (AD) method on MH agar. Results were interpreted according to EUCAST v 2.0 clinical breakpoints. MIC agreement between the two methods was defined as ±1 log2 dilution difference in MIC. Interpretive error rate for MTS vs. AD was calculated as follows: a major error was assumed if the isolate was classified as resistant by one method and as susceptible by another; a minor error was considered if the isolate was categorised as intermediate by one method and as either susceptible or resistant by another. Results: A total of 4081 antibiotic-isolate combinations were evaluated and compared using both methods. Overall agreement of MIC values was 90.8%, with a specific agreement ranging from 78.0% to 97.0%. The major interpretive error rates ranged from 0% to 13.3% (Table 1). Conclusions: The evaluated MTS method demonstrated overall good concordance with AD method both in terms of MIC agreement and distribution of isolates into susceptibility categories. Thus, it can be recommended for susceptibility testing of P. aeruginosa and Acinetobacter in clinical settings.

Table 1. Comparative performance of MIC determination by MTS and AD methods for *P. aeruginosa* (PA) and *Acinetobacter* spp. (AC) isolates.

Antibiotic	% MIC Agreement			% Interpretive Errors			
				Major		Minor	
	PA	AC	Total	PA	AC	PA	AC
Piperacillin-Tazobactam	94.2	NT	94.2	4.8	NT	NA	NT
Ceftazidime	74.9	97.0	82.5	13.3	NC	NA	NC
Cefepime	96.6	94.4	95.8	7.8	NC	NA	NC
Imipenem	86.1	63.5	78.0	5.6	3.3	17.6	33.7
Meropenem	93.8	96.4	94.7	0.0	0.0	7.1	7.2
Sulbactam	NT	80.3	80.3	NT	NC	NT	NC
Gentamicin	99.1	93.3	97.0	4.4	0.6	NA	NA
Tobramycin	91.6	92.7	92.0	1.8	0.6	NA	NA
Amikacin	93.8	86.4	91.2	0.0	0.0	3.3	7.9
Ciprofloxacin	96.3	97.9	96.9	0.3	0.0	5.2	NA

NT = not tested; NC = no criteria; NA = not applicable.