Poster #6996

Performance of Accelerate PhenoTest™ BC kit for Susceptibility Testing of *Acinetobacter baumannii*

Justin Towne
+1-520-241-3778
jtowne@axdx.com

J. Towne[1], N. Oppermann[1], R. Humphries[1], Y. Doi[2]
[1]Accelerate Diagnostics, Inc., Tucson, AZ
[2]Division of Infectious Disease, University of Pittsburgh School of Medicine, Pittsburg, PA

AMENDED ABSTRACT

Introduction
Acinetobacter baumannii (AB) is a major cause of bacteremia worldwide. Healthcare-associated infections are associated with high mortality rates, due to multidrug resistance in this species, necessitating rapid identification and susceptibility testing.

Methods:
71 AB were seeded into human blood, inoculated to into BD BACTEC™ Aerobic Plus bottles and incubated on the BD BACTEC™ FX system. Upon positive flag, these were evaluated using the Accelerate PhenoTest™ BC kit for antimicrobial susceptibility to amikacin (AMK), ciprofloxacin (CIP), colistin (CST), cefepime (FEP), meropenem (MEM), minocycline (MIN), ampicillin-sulbactam (SAM) and piperacillin-tazobactam (TZP).

MICs were also determined by reference broth microdilution (BMD) in cation-adjusted Mueller Hinton broth (Difco™, BD, Sparks MD), from isolated colonies according to CLSI M07-A4 standard. BMD was performed in triplicate using the same inoculum of bacteria, and the modal MIC was used for evaluation.

Results were evaluated using 2018 EUCAST and CLSI breakpoints, as available. Essential agreement (EA), categorical agreement (CA), minor errors (miE), major errors (ME) and very major errors (VME) were calculated.

Results:
Performance data are shown in Table 1.

Conclusions:
The Accelerate PhenoTest™ BC kit performance differed across CLSI and EUCAST breakpoints, but was generally good. The majority of errors were miE, with the exception of CST, where no intermediate breakpoint exists.

INTRODUCTION

The Accelerate Pheno™ system is an innovative technology for fast diagnosis of bloodstream infection, including *Acinetobacter baumannii*, providing identification in approximately 90 minutes and phenotypic antimicrobial susceptibility testing results in approximately 7 hours directly from positive blood culture.

In this study, the performance of the Accelerate Pheno™ system with seeded positive blood cultures containing *A. baumannii* was evaluated compared to broth microdilution using both 2018 EUCAST and CLSI breakpoints.

METHODS

Antimicrobial susceptibility testing of the Accelerate PhenoTest™ BC kit using the Accelerate Pheno™ system (Figure 1) utilizes morphokinetic cellular analysis (MCA), which optically records bacteria growing in the presence of an antibiotic.

Bacterial cell response profiles are generated from time-lapse images and compared to algorithm models to report out MIC values. The AXDX software utilized v1.3.2 image analysis.

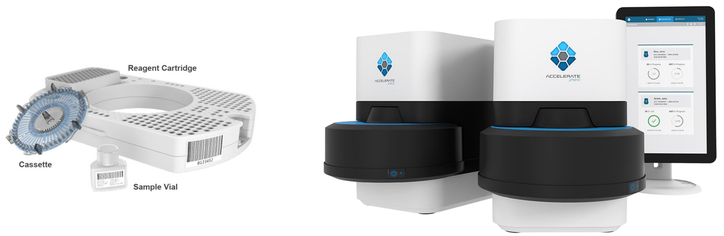

Figure 1: *Accelerate PhenoTest™ BC kit components (left) and Accelerate Pheno™ system (right)*

RESULTS

Table 1: *AST performance*

Drug	# Valid Results (EA%)	CLSI Breakpoints*				EUCAST Breakpoints**			
		CA [%]	miE [%]	ME [%]	VME [%]	CA [%]	miE [%]	ME [%]	VME [%]
AMK	70 (78.6)	77.1	21.4	0.0	3.2	97.1	2.9	0.0	0.0
CIP	71 (97.2)	98.6	1.4	0.0	0.0	100.0	0.0	0.0	0.0
CST	71 (87.3)	85.9	0.0	14.3	12.5	85.9	0.0	14.3	12.5
FEP	70 (87.1)	82.9	15.7	0.0	2.1	-	-	-	-
MEM	71 (95.8)	94.4	5.6	0.0	0.0	87.3	12.7	0.0	0.0
MIN	70 (98.6)	70.0	30.0	0.0	0.0	-	-	-	-
SAM	71 (95.8)	80.3	18.3	4.3	0.0	-	-	-	-
TZP	68 (95.6)	97.1	2.9	0.0	0.0	-	-	-	-

*CIP, CST, FEP, MEM, MIN and SAM are RUO with CLSI breakpoints
**There are no EUCAST breakpoints for FEP, MIN, SAM and TZP

The Accelerate PhenoTest™ BC kit performance was higher with EUCAST breakpoints compared to CLSI for amikacin and ciprofloxacin. Performance was identical between EUCAST and CLSI breakpoints for colistin, and performance was higher with CLSI breakpoints compared to EUCAST for meropenem.

CONCLUSIONS

The Accelerate PhenoTest™ BC kit performance was generally good, but differed across CLSI and EUCAST breakpoints. The majority of errors were minor, with the exception of colistin, which has no intermediate breakpoint.

ACKNOWLEDGEMENTS

The authors would like to thank Lauren Truman and Irma Perez for work associated with broth microdilutions.

Copyright © 2019 Accelerate Diagnostics, Inc. All Rights Reserved.