Using the Accelerate Pheno Test for rapid reporting of antimicrobial susceptibility in real life

A. Fuentes, N. Chueca, A. de Salazar, M. Álvarez, A. Peña, M. E. Yuste, F. Anguita, F. Garcia.

Hospital Universitario San Cecilio. Instituto de investigación Ibs. Granada

29th ECCMID Amsterdam, Netherlands 13–16 April 2019

BACKGROUND

Accelerate PhenoTest (Accelerate Diagnostics, USA) is an FDA approved method that combines molecular methods to identify bacteria and digital microscopy to measure bacterial sensitivity in real time, providing results in a maximum period of 8 hours. Here we compare the results obtained by Accelerate with widely validated automated systems, and to verify the clinical usefulness of this technique as a new routine methodology in critically ill patients.

MATERIALS/METHODS

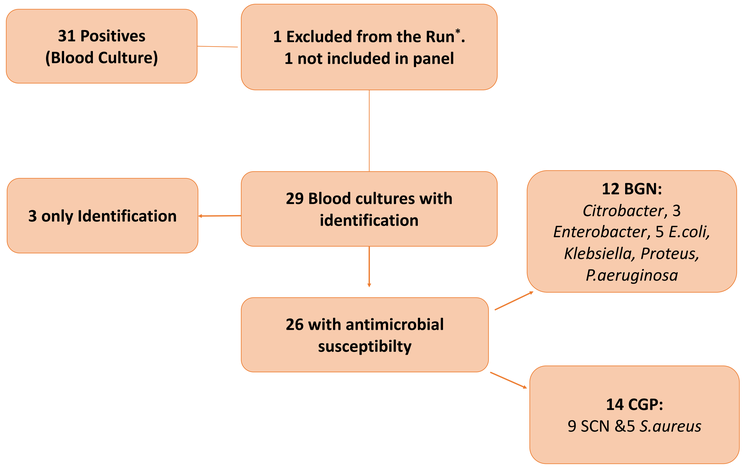
For sample processing, 1 ml of blood from positive blood culture bottles is inoculated directly into the Accelerate system without further procedures. We evaluated the test with positive blood cultures from critically ill patients who had sepsis and were in the Intensive Care Unit or the Infectious Diseases Service. In parallel, the identification of the bacteria was carried out by MALDI-TOF byotiper and the sensitivity studied by Microscan WalkAway 96 Plus Beckman Coulter.

RESULTS

A total of 31 blood cultures were analyzed in patients with severe sepsis criteria, 2 were excluded. Of the remaining 29, identification was obtained in all of them, but only the final antibiogram was reached in 26 patients. The pathogens isolated with antibiogram were: 14 CGP and 12 BGN. We found a 100% concordance in identification and antibiotic sensitivity for CGP, but this was not the case for BGN, the discordances found are detailed in Table 1.

Species	Antibiotics	Accelerate	MsC	Method Reference / Explanation
E.coli	Aztreonam	Suceptible	Resistant	E-test Suceptible
	Amox/Clav.	Resistant	Suceptible	E-test Suceptible
Citrobacter spp.	Cefepime	Suceptible	intermediate	Issues with direct MicroScan suspension
	Aztreonam	Suceptible	Resistant	
E.coli	Amox/Clav.	Resistant	Suceptible	

Table 1: Discrepancies obtained.



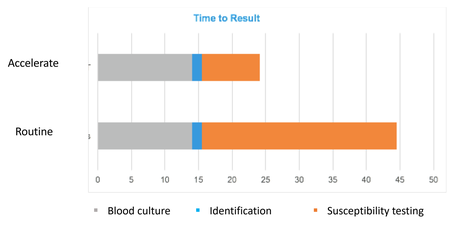
* PhenoTest technical failure.

Antibiotic	Essential Agreement[1]	Categorical Agreement[2]
Amikacin	100%	100%
Amox/Clav.	85,7%	71,4%
Ampicillin	100%	100%
Aztreonam	80%	80%
Cefazolin	N/A	N/A
Cefepime	81,8%	81,8%
Ceftazidime	80%	80%
Ceftriaxone	N/A	N/A
Cefuroxime	100%	100%
Ciprofloxacin	88,9%	100%
Ertapenem	100%	100%
Gentamicin	100%	100%
Meropenem	100%	100%
Piperacillin-Tazobactam	88,9%	77,8%
Tobramicin	100%	85,7%
Trimetoprim-Sulfamethoxazol	88,9%	77,8%

Antibiotic	Essential Agreement[1]	Categorical Agreement[2]
Ampicillin	N/A	N/A
Ceftaroline	100%	100%
Daptomicyn	100%	100%
Doxicycline	100%	100%
Erythromycin	100%	100%
Linezolid	100%	100%
Trimetoprim-Sulfametoxazol	80%	100%
Vancomycin	92,9%	100%
Cefoxitin	N/A	88,9%

[1]Results based on EUCAST breakpoints, comparing to truncated reportable ranges by PhenoTest.
[2]. Results based on EUCAST breakpoints, comparing to truncated reportable ranges by MicroScan

Accelerate allows us to obtain identification and antibiotic sensitivity in a maximum period of 8 hours, there is a difference of 12h approx. with the routine methods.



CONCLUSIONS

Accelerate Pheno Test is presented as an effective, fast and easy to use method that performs the identification in 2 hours and the study of antibacterial susceptibility of bacteremia in a maximum period of 8 hours. Its major limitation is the number of microorganisms included in the panel.