Evaluating of Accelerate Pheno™ System in a Clinical Setting: Comparison of Identification and Antibiotic Susceptibility Test Results of 224 Prospective Positive Blood Cultures to Standard Laboratory Methods at Detroit Medical Center

P. Lephart1, K.S. Kaye2, J.M. Pogue3, T. Painter4, T. Burger5, M. Taylor, C.C. Cooper, M. Fairfax4,1 and H. Salimnia1

1. Detroit Medical Center University laboratories, 2. Infectious Diseases, 3. Pharmacy and 4. Pathology, Wayne State University School of Medicine, Detroit, MI.

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INTRODUCTION

Bloodstream infections (BSI) cause more than one million hospitalizations, 256,000 deaths and $24 billion in hospital costs annually. Rapid organism identification (ID) and antimicrobial susceptibility testing (AST) can guide appropriate antibiotic therapy and improve patient outcomes. The Accelerate Pheno™ system identifies common pathogens and provides MICs for multiple antibiotics directly from positive blood cultures in 7 hours. We aimed to evaluate the performance (accuracy) and time to organism ID and AST results of the Accelerate Pheno™ system compared to standard laboratory methods using positive blood cultures collected prospectively from unique patients with suspected BSI.

METHODS

Residual positive blood bottles were tested on the Accelerate Pheno™ system within 8 hours of positivity using pre-FDA cleared software (1.0) and CLSI 2016 breakpoints. ID sensitivity and specificity and AST essential (EA) and/or categorical agreement (CA) were calculated and compared to our current clinical laboratory methods. The standard methods at the Detroit Medical Center (DMC) consist of a combination of phenotypic, biochemical method and/or MALDI-ToF techniques for organism ID combined with the BD Phoenix™ Automated Microbiology System. Time to organism ID was also compared to the Verigene® System.

RESULTS

Based on 224 unique prospective positive blood cultures tested, the Accelerate Pheno™ system achieved an overall EA and CA of 96.3% and 94.8%, respectively. Results of 99.7% for pathogen ID compared to our standard methods. For AST, the Accelerate Pheno™ system provided MICs for multiple antibiotics directly from positive blood cultures in 7 hours. We aimed to evaluate the performance (accuracy) and time to organism ID and AST results of the Accelerate Pheno™ system compared to standard laboratory methods using positive blood cultures collected prospectively from unique patients with suspected BSI.

CONCLUSION

Rapid ID and AST of bloodstream pathogens allows for rapid transition to targeted therapy which could reduce mortality and unnecessary broad-spectrum antibiotic exposure. These data showed the ability of the Accelerate Pheno™ system to provide accurate ID in less than 90 minutes, and most importantly, reliable AST results in less than 7 hours from the detection of a positive blood culture; thus decreasing the time to AST results by nearly 2 days compared to standard methods.

RECOMMENDATIONS

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