Evaluation of the Portrait Staph ID/R Blood Culture Panel in Pediatric and Adult Patient Populations

A. Hopper[1], M. V. Powers-Fletcher [2], S. Holt[1], A. Phillips [1], R. Grand-Pre[1], M. Dickey [1], A. Blaschke[2], M. R. Couturier[2], J. A. Daly [1, 2]

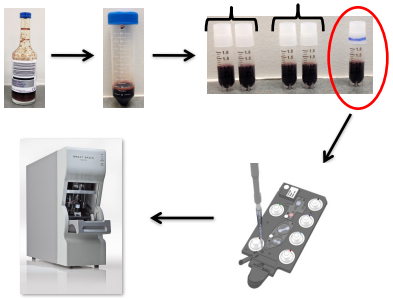
(1) Primary Children's Hospital, Salt Lake City, UT, (2) University of Utah School of Medicine, Salt Lake City, UT

Introduction

Bloodstream infections (BSI) are associated with significant morbidity and mortality. The most common BSI pathogens are *Staphylococcus* species such as *S. aureus* and *S. epidermidis*, both of which can harbor the gene (*mecA*) encoding methicillin resistance. The ability to rapidly identify these organisms is critical for patient care, particularly the choice of antibiotic therapy. The purpose of this study was to determine the performance of a novel molecular diagnostic assay in identifying *Staphylococcus* spp., with or without *mecA*, from blood cultures compared to traditional methods.

Method

Blood samples collected from adult and pediatric patients were cultured and processed according to standard practice. Blood culture bottles positive for gram positive cocci were then stored for up to 72 hours at 2-8°C, after which an aliquot of broth was tested using the Portrait Staph ID/R Blood Culture Panel (Great Basin Diagnostics, Utah). Results were compared to those obtained using either the BD Phoenix™ PID panel or MALDI-TOF MS for identification and cefoxitin disk diffusion for prediction of methicillin resistance.



Results

During the study period, 150 blood cultures were tested using the Portrait Staph ID/R panel; 115 of those were positive for staphylococci.

Table 1. Combined Data (Identification): All *Staphylococcus* Species

	Portrait vs. BD Phoenix Identification	Portrait vs. MALDI Identification
Sensitivity [TP/(TP+FN)x100]	99.1	99.1
Specificity [TN/(FP+TN)x100]	96.3	96.3
PPV [TP/(TP+FP)]	0.991	0.991
NPV [TN/(FN+TN)]	0.963	0.963

Table 3. Combined Data (MecA): All *Staphylococcus* Species

	Portrait vs. Cefoxitin
Sensitivity [TP/(TP+FN)x100]	95.2
Specificity [TN/(FP+TN)x100]	94.3

Table 2. Combined Data (Identification): By Species

S. aureus

	Portrait vs. BD Phoenix Identification	Portrait vs. MALDI Identification
Sensitivity [TP/(TP+FN)x100]	100	100
Specificity [TN/(FP+TN)x100]	100	100
PPV [TP/(TP+FP)]	1	1
NPV [TN/(FN+TN)]	1	1

S. epidermidis

	Portrait vs. BD Phoenix Identification	Portrait vs. MALDI Identification
Sensitivity [TP/(TP+FN)x100]	89.4	95.7
Specificity [TN/(FP+TN)x100]	89.7	92.8
PPV [TP/(TP+FP)]	0.857	0.898
NPV [TN/(FN+TN)]	0.924	0.970

Results Continued

Table 4. Febrile Infant Data (Identification): By Species

S. aureus

	Portrait vs. BD Phoenix Identification	Portrait vs. MALDI Identification
Sensitivity [TP/(TP+FN)x100]	100	100
Specificity [TN/(FP+TN)x100]	100	100
PPV [TP/(TP+FP)]	1	1
NPV [TN/(FN+TN)]	1	1

S. epidermidis

	Portrait vs. BD Phoenix Identification	Portrait vs. MALDI Identification
Sensitivity [TP/(TP+FN)x100]	92.9	100
Specificity [TN/(FP+TN)x100]	80.0	90
PPV [TP/(TP+FP)]	0.867	0.933
NPV [TN/(FN+TN)]	0.889	1

Conclusion:

The Portrait Staph ID/R panel performs with high sensitivity and specificity for the identification of *Staphylococcus* spp. and detection of *mecA* compared to current laboratory methods. Implementation of this methodology in clinical laboratories could allow for accurate and more rapid identification of BSI caused by methicillin-resistant staphylococci and improve patient care.