Validation of Colorex™ CHROMESBL/mSuperCARBA bi-plate on WASP®/WASPLab® to Screen for ESBL and CPE

M. Gaskin[1], D. Yamamura[1,2], J. Korver[1]
[1] Hamilton Regional Laboratory Medicine Program
[2] Department of Pathology and Molecular Medicine, McMaster University, Hamilton, ON

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Introduction

Timely identification of Extended Spectrum Beta-lactamase (ESBL) and Carbapenemase (CPE) producing organisms from surveillance specimens results in a reduction in the spread of colonization and infection. The overall financial burden on the healthcare system is also lessened by decreasing the length of hospital stay and potential treatments. With the introduction of WASP®/WASPLab® we have endeavored to be innovative and implement time and cost effective methodologies to help prevent the spread of ESBL/CPE organisms in our hospitals. The objective of this study was to validate the use of a Colorex™ (CHROMagar™) CHROMagarESBL/mSuper CARBA bi-plate using a 1ul dual loop to seed plates on the WASP®, incubate and analyze plates on the WASPLab® and perform digital imaging analysis.

Figure 1:

Materials and Methods

In this study 239 clinical ESBL specimens were collected with ESwab® kits. A protocol was implemented on the WASP® which uses a 1ul dual loop and a twin loop 2/bi-plate streaking pattern for the new CHROMagarESBL/mSuper CARBA bi-plate. An additional 49 known reference strains of ESBL,CPE, SPICE and AMP C were also tested. After processing, the bi-plates were incubated in the WASPLab® for 20 hours at which point digital imaging analysis was performed. Results were compared to current testing which uses a Colorex™ (CHROMagar™) C3GR/KPC bi-plate.

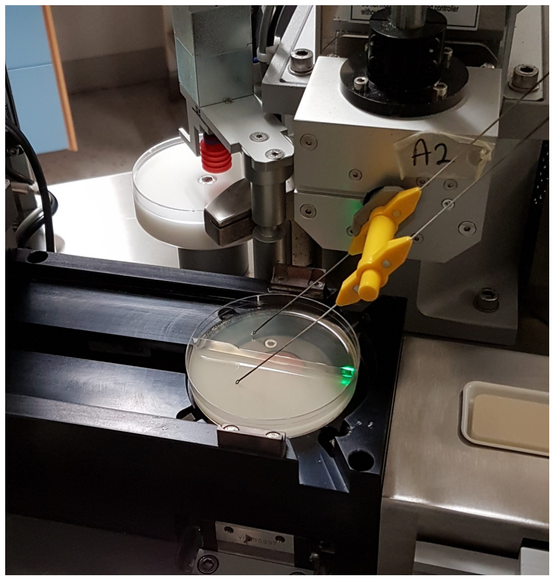

Figure 2: WASP® Dual loop

Results

Of the 239 swabs tested, 90 were positive for ESBL and 7 for CPE using our current C3GR/KPC bi-plate, versus 91 positives for ESBL and 7 positive CPE on the new Colorex™(CHROMagar™)CHROMagarESBL /mSuper CARBA bi-plate using a 1ul dual loop to seed plates on the WASP®, incubate and analyze plates on the WASPLab®. With the new media, there was an increase in no growth cultures by 29% and a marked reduction in breakthrough growth of AMP C producing strains, *Citrobacter freundii complex* and SPICE organisms on the CHROMagarESBL side, 89%, 82% and 92% respectively. These organisms require further offline confirmatory testing to rule out ESBL. Testing bi-plates on the WASP® using a dual loop results in a 39% reduction in processing time compared to a 2 plate protocol. 33 known CPE strains were tested all of which grew on the SuperCARBA compared to 30 which grew on the KPC plates.

Figure 3: WASPLab®

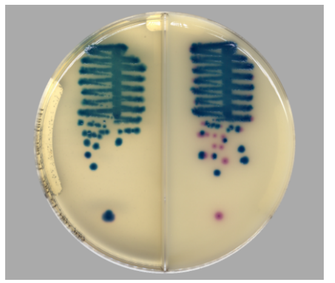

Figure 4: Positive E. coli ESBL/K. pneumoniae CPE

Conclusion

The reduction in breakthrough growth on the CHOMagarESBL side of the Colorex™ (CHROMagar™) CHROMagarESBL/mSuper CARBA bi-plate results in far less offline testing leading to time and cost savings. The 39% reduction in processing time on the WASP®, as seen in the timing study, is of critical importance as it positively affects the functional capacity of the whole WASPLab® system leading to higher throughput. The WASPLab® segregation software allows you to view and result multiple negative images in just seconds.

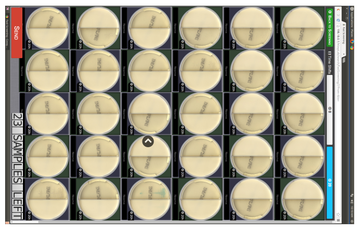

Figure 5: WASPLab® Segregation Software

Contact: Gaskin Mark Email: gaskinm@HHSC.CA