Detection of MRSA by the BD Genome IDI MRSA Assay (BMA) from Flocked Swabs transported in Liquid Stuart’s
David Goldfarb¹, Peter Jessamine¹,², Angela Bonneau¹, Karam Ramotar¹,², Marc Desjardins¹,²
The Ottawa Hospital¹, The Ottawa Hospital Research Institute¹, Children’s Hospital of Eastern Ontario²

ABSTRACT (revised)

Background: MRSA screening by culture requires 48-72 hours compared to 1 hr for the BMA. At the Ottawa Hospital, nasal and rectal swabs are pooled in a selective broth prior to testing. To improve turnaround times (TAT) we evaluated the performance of the BMA using a flocked swab and a liquid Stuart’s (LS) transport system.

Method: Flocked swabs dipped in a 0.5 McFarland saline suspension of CMRSA-2, 7 and -10 clinical isolates were placed in the LS and incubated at room temperature (RT) for 1 hr, 2 hr, and overnight. To simulate a rectal swab, CMRSA-2 inoculated swabs were dipped in a MRSA negative stool and incubated in LS at RT for 1 hr, 2 hr and overnight. For the simulated nasal swabs, naso/orbita swabs of a negative volunteer were swabbed prior to dipping in a CMRSA-2 suspension and incubated 1 hr, 2 hr and overnight at RT. For BMA testing, swabs were vortexed in the LS and a 50ul aliquot was transferred to the sample dishes buffer and processed according to manufacturer’s instructions. All runs were performed in triplicate. Serial dilutions of 6 different CMRSA clinical isolates were used in order to determine the limit of detection for the BMA in both LS and 0.45 % sodium chloride solution (NaCl). Duplicate runs were performed using both the BMA kit (mechanical) lysis and achromopeptidase lysis procedures.

Results: All 0.5 McFarland inoculated flocked swabs transported in LS using simulated rectal and nasal specimens were detected by BMA. Using both LS and NaCl as the transport medium the BMA had a limit of detection of 10⁴ CFU/mL. The achromopeptidase lysis procedure did not perform as well as the BMA kit lysis procedure using LS as the transport medium. Pooling of nasal and rectal specimens collected on flocked swabs and transported in LS could be used with the BMA for direct testing eliminating the use of the selective broth and potentially reducing TAT.

Conclusions: Flocked swabs transported in LS have the potential to be used with the BMA for screening of MRSA colonized patients. Achromopeptidase lysis procedure did not perform as well as the BMA kit lysis procedure using LS as the transport medium. Pooling of nasal and rectal specimens collected on flocked swabs and transported in LS could be used with the BMA for direct testing eliminating the use of the selective broth and potentially reducing TAT. Further evaluations are ongoing to determine the feasibility and performance of the BMA from nasal and rectal specimens collected on flocked swabs and pooled in LS.

METHODS

Flocked swabs (Starplex Scientific Inc., Etobicoke, ON Canada) dipped in a 0.5 McFarland saline suspension of CMRSA-2, CMRSA-7 and CMRSA-10 clinical isolates were placed in LS and inoculated at room temperature (RT) for 1 hr, 2 hr, and overnight. To simulate a rectal swab, a CMRSA-2 inoculated swab was dipped in a MRSA negative stool and incubated in LS at RT for 1 hr, 2 hr and overnight. For the simulated nasal swabs, naso/orbita swabs of a negative volunteer were swabbed prior to dipping in a CMRSA-2 suspension and incubated 1 hr, 2 hr and overnight at RT. For BMA testing, swabs were vortexed in the LS and a 50ul aliquot was transferred to the sample buffer and processed according to manufacturer’s instructions. All runs were performed in triplicate. Serial dilutions of 6 different CMRSA clinical isolates were used in order to determine the limit of detection for the BMA in both LS and 0.45 % sodium chloride solution (NaCl). Duplicate runs were performed using both the BMA kit (mechanical) lysis and achromopeptidase lysis procedures described previously¹. Accuracy of serial dilutions was confirmed via colony counts.

REFERENCES