O261
Oral Session
PCR and other molecular tests directly on blood: what is new?

BENCH TO BEDSIDE: RAPID IDENTIFICATION AND SUSCEPTIBILITY TESTING OF STAPHYLOCOCCUS AUREUS FROM BLOOD CULTURE ISOLATES

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Objectives: *Staphylococcus aureus* bacteremia (SAB) is a common and significant cause of morbidity and mortality in hospitalised patients. The clinical outcome of patients with SAB is dependent on several factors, however rapid administration of appropriate anti-staphylococcal antibiotics is vital. Appropriate antimicrobial advice to clinicians for directed therapy relies on rapid availability of identification and susceptibility results. Our target was to achieve this within 4 hrs from the time of a blood culture bottle signalling positive for at least 50% of our study cohort.

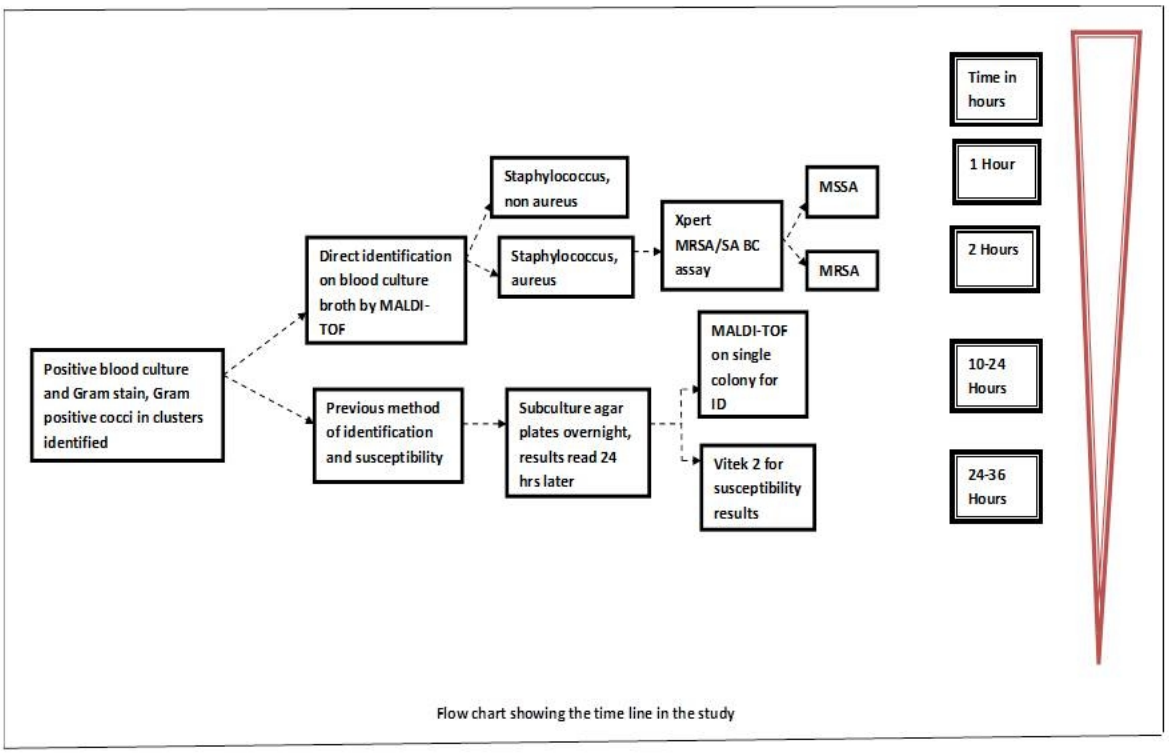
Methods: We performed MALDI-TOF MS (bioMérieux Vitek MS) directly on BC broth for all positive blood cultures (Bactec FX) with clustered Gram positive cocci on Gram stain during office hours. Repeat isolates form the same patient were not included. If S. aureus was identified by MALDI-TOF, we ran an Xpert MRSA/SA BC assay (Cepheid) on the broth for the direct detection of methicillin resistance by the mec A gene.

We compared the time taken from signalling of a positive blood culture to the availability of a result using this rapid strategy with our previous diagnostic pathway, using historical controls. All non-duplicate positive blood cultures from the period (22/06/2013 to 06/12/2013) were included and compared to non-duplicate historical controls during working hours using the previous method. The previous method involved identifying single colony cultures subcultured on agar plates by MALDI-TOF and standard susceptibility testing (Vitek 2) using CLSI criteria.

Results: From the positive blood culture bottles containing Gram positive cocci in clusters, 59 were identified as SA by the direct MALDI method. The rapid strategy correctly detected 59 /59 of the SA isolates (100%). 52 (88%) of these were identified as methicillin susceptible SA (MSSA) and 7 (12%) were MRSA.

There was 1 mixed culture of SA and a coagulase negative SA (CNS) which was correctly identified by the MALDI-TOF and identified as a SA by the Xpert BC assay. There were no other mixed cultures with either SA/MRSA or CNS/MRSA in our study.

Conclusion: This small observational study illustrates the use of this streamlined, rapid and cost effective diagnostic strategy in the identification and susceptibility of SA. We were able to identify and provide susceptibility testing to 46 of 59 (77%) of our SAB patients within 4 hours. 13 of these were done in under 2 hours. We also identified patients who were not deemed at risk for SAB/MRSA infections based on their risk factor profile who have benefited from this rapid diagnostic strategy. Early de-escalation from empirical Vancomycin therapy was also a benefit in patients who were identified to have MSSA bacteremia.



Flow chart showing the time line in the study