O263
Oral Session
PCR and other molecular tests directly on blood: what is new?

EVALUATION OF THE FILMARRAY BLOOD CULTURE IDENTIFICATION PANEL IN IDENTIFICATION OF POLYMICROBIAL BLOOD CULTURE BOTTLES

A. Giaquinto[1], F. Arena[2], T. D'Inzeo[1], B. Fiori[1], **G. De Angelis**[1], G. Menchinelli[1], L. Piccioni[1], M. Sanguinetti[1], G.M. Rossolini[2], T. Spanu[1]

[1]Microbiology, Catholic University, Roma, Italy ; [2]Medical Biotechnologies, University of Siena, Siena, Italy

Objectives. Rapid, reliable identification of microorganisms responsible for bloodstream infections (BSIs) is essential for prompt, effective treatment. Recently, matrix-assisted laser desorption ionization time-of flight mass spectrometry (MALDI-TOF MS) emerged as a reliable, time-saving tool for routine identification of pathogens directly from blood culture (BC) broths. Its major limit is the inability to accurately identify all species in polymicrobial BCs. The FilmArray blood culture identification panel (FA; BioFire, Salt Lake City, UT) is a recently developed molecular method for rapid identification of 19 bacteria, five yeasts and three resistance genes directly from BC bottles. It is designed for use with FilmArray platform. The system combines nucleic acid extraction from BC broth specimens, high-order nested multiplex PCR, and post-PCRDNA melting curve analysis. Two recent studies suggested good sensitivity and specificity. Unfortunately, both studies included a relatively small proportion of polymicrobial infections. The purpose of this study was to determine if this new assay would correctly identify all species from BC bottles yielding polymicrobial growth.

Methods: The study was conducted between November 2012 and October 2013 in the clinical microbiology laboratories of the Catholic University Medical Center and the University of Siena. Broth aliquots from each positive bottle showing different morphotypes on Gram staining examination were collected for direct FilmArray assay. Testing was performed according to the protocol suggested by the manufacturer. Briefly, 300 µl of BC broth was transferred into the FilmArray pouch for analysis. Extraction, amplification, detection, and analyses were completely automated within the pouch. BC broth aliquots were subcultured according to standard procedures and isolates were identified using conventional biochemical tests and MALDI-TOF MS. The comparison method for assessment of resistance marker detection consisted of PCR amplification and sequencing to identify bla_{KPC}, *mec* and *van* genes.

Results: Three hundred and fourteen isolates grew from the 144 blood cultures tested. Identification results were concordant with those obtained by the conventional culture-based method for 94 % (295/314) of the isolates. Nineteen microorganisms were not identified by the FilmArray. Of these, seventeen (4 *Bacillus cereus*, 4 *Corynebacterium* spp., 3 *Morganella morganii*, 2 *Stenotrophomonas maltophilia*, 1 *Clostridium perfrigens*, 1 *Enterobacter aerogenes*, 1 *Pantoea agglomerans*, and 1 *Providencia stuartii*) were not detected because these species are not included in the panel. The FilmArray assay correctly detected all isolates harboring bla_{KPC} (n = 16), *mec* (n=52) and *van* (n=2) genes, with no false positive results.

Conclusion: Results were available in 60 min, suggesting that this approach is a reliable, time-saving tool for routine identification of polymicrobial BSIs. Considering the high cost of the test there is urgent need to establish its cost effectiveness in the management of patient with polymicrobial infections.