Evaluation of Bruker MALDI-TOF Mass Spectrometry for Identification of Clinical Isolates in Hospital Sultanah Nur Zahirah

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Abstract

Early and reliable identification of microorganisms in sepsis patients is crucial in order for specific antimicrobial therapy to be administered as earliest as possible to reduce the risk of serious complications and death. Matrix-Assisted-Laser-Desorption/Ionization-Time-Of-Flight-Mass Spectrometry (MALDI-TOF MS) is becoming a popular tool for rapid identification of microorganisms. This prospective study evaluates the performance of Bruker MALDI-TOF Biotyper (MBT) with conventional biochemical identification system, API (Biomerieux). 124 randomly chosen clinical isolates from various clinical specimens within a 2-months period were subjected to MALDI-TOF analysis and routine laboratory identification method by API according to the manufacturer’s instructions. Bruker MBT correlates 91.1% (113/124) to API test. Between the two evaluated methods, Bruker MBT has a higher success rate in identification (95.1% vs 93.5%) when compared to the final identification reported by the laboratory. Overall, the discrepancy for API is higher than that of Bruker MBT (8 isolates vs. 6 isolates, respectively). Bruker MBT (95.1%) showed higher performance with lower percentage of unidentified and discordant identity compared to API (93.5%) consistent with previous findings¹⁻³. Bruker MBT failed to identify three isolates; C. accolens, C. jeikeium and Methylobacterium mesophilicum, which are all contained inside the database possibly due to error during sample preparation that can be further tested using extended direct transfer or extraction methods. Bruker MBT yield faster results requiring approximately five to 30 minutes depending on the methodology compared to conventional methods that requires 18-24 hours for colony isolation and at least 24 additional hours for species identification⁴. Implementation of Bruker MBT can greatly improve the quality of patient care by providing a simple yet reliable, accurate diagnostic results.

Keywords: MALDI-TOF MS; mass spectrometry; diagnostic microbiology

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