Molecular detection, identification and differentiation of Burkholderia pseudomallei

ABSTRACT

Burkholderia pseudomallei are Gram negative highly pathogenic bacteria of humans and animals causing a multisystemic disease called melioidosis. They have recently gained a lot of interest from the research community and public health organisations because of their great potential to be used as an agent of bioterrorism. This has made the search for simple, rapid, accurate and the most definitive means of their detection, identification and discrimination very critical and necessary. This article aimed to review the molecular techniques used for detection, identification and differentiation of B. pseudomallei. Although, culture and isolation techniques maintained their usefulness in confirming cases of melioidosis, their time limitation (can take up to a week for confirming diagnosis) leads to the search for rapid and simple techniques. Consequently, serology-based tests have been developed which are both faster and less sophisticated. However, the presence of high background titre levels and cross-reaction with other organisms make it less reliable. Thus, efforts have been directed to explore rapid and accurate molecular techniques and resulting in the development and validation of various PCR-based identification techniques targeting either single or multiple genes. Although requiring some level of instrumentation and expertise, PCR-based techniques have been reported to be very useful in diagnosis of melioidosis. We recommend the 16S rRNA PCR (especially augmented with other molecular methods such as gene sequencing and analysis) and MLST techniques for timely detection, identification and differentiation of B. pseudomallei for routine diagnosis and epidemiological studies respectively.