To review recent developments in molecular based diagnostic platforms used for the identification of bloodstream infections, with a focus on assays performed directly on blood samples and positive blood cultures" Peker et al (2018).

Abstract:

Background: Bloodstream infections are a major cause of death with increasing incidence and severity. Blood cultures are still the gold standard for microbiological diagnosis, but are rather slow. Molecular methods can be used as add-on complementary assays. They can be useful to speed up microbial identification and to predict antimicrobial susceptibility, applied to direct blood samples or positive blood cultures.

Aim: To review recent developments in molecular based diagnostic platforms used for the identification of bloodstream infections, with a focus on assays performed directly on blood samples and positive blood cultures.

Sources: Peer reviewed articles, conference abstracts and manufacturers' websites.

Content: We give an update on recent developments of molecular methods in diagnosing BSIs. We first describe the currently available molecular methods to be used for positive blood cultures including: a) in situ hybridization-based methods; b) DNA-Microarray-based hybridization technology; c) nucleic acid amplification-based methods; and d) combined methods. Subsequently, molecular methods applied directly to whole blood samples are discussed, including the use of nucleic acid amplification-based methods, T2 magnetic resonance-based methods and metagenomics for diagnosing BSIs.

Implications: Advances in molecular-based methods complementary to conventional blood culture diagnostics and antimicrobial stewardship programs may optimize infection management by allowing rapid identification of pathogens and relevant antimicrobial resistance genes. Rapid diagnosis of the causing microorganism and relevant resistance determinants is important for early administration and modification of appropriate antimicrobial therapy. Ultimately, this may lead to improved quality and cost-effectiveness of health care, as well as reduced antimicrobial resistance selection.

Reference:

Peker, N., Couto, N., Sinha, B. and Rossen, J.W. (2018) Diagnosis of bloodstream infections from positive blood cultures and directly from blood samples: recent developments in molecular approaches. Clinical Microbiology and Infection. May 19th. .

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