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Abstract (publication only)

The contribution of a Multiplex real-time PCR to detect bacterial and fungal bloodstream infections in a cohort of thoracic allograft recipients

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Objectives: Bloodstream infections (BSIs) are a major cause of morbidity and mortality in thoracic allograft recipients. The early and accurate identification of the responsible pathogen and the administration of the appropriate treatment are of critical importance for improved patient survival. In the early post-transplant (Tx) period (0-2 months post-Tx) when recipients are receiving empirical antibiotic treatment, detection of pathogens by the conventional blood culture (BC) methodology may be hindered by the empirical broad-spectrum antibiotic therapy administered for preventing post-transplant infections. In the present study we investigated the potential clinical utility of a multiplex real-time PCR system (SeptiFast®, Roche Diagnostics) to detect BSIs infections in a cohort of thoracic allograft. Methods: The study included the analysis of 130 blood samples from 30 thoracic allograft recipients (23 heart and 7 lung) using SeptiFast® in parallel with BC. Samples were drawn when there were clinical and laboratory signs of a BSI. The applied multiplex real-time PCR assay allowed the detection of a wide panel of Gram-positive and Gram-negative bacteria and fungi in 6 h and was performed according to manufacturer's guidelines. Results: Real-time PCR yielded concurrent negative and positive results with BC methodology in 113 (86.9%) and 5 (3.9%) samples, respectively, with 100% concordance in species identification. Diverging results were obtained in 9 (6.9%) samples, where only real-time PCR was positive and in 3 (2.3%) samples, where only blood cultures were positive. Eight of the PCR-only positive samples were drawn from patients during the early post-transplant period when they were under empirical antibiotic treatment. The combined use of SeptiFast® and BC increased the number of positive samples detected to 17 (13.1%) from 14 (10.8%) detected with SeptiFast® alone or from 8 (6.1%) detected with BC alone. In cases of concurrent positivity, SeptiFast® results were available on average 1.5 days earlier than BC results. Conclusion: The PCR-based SeptiFast® test is a valuable add-on to the traditional BC method for the rapid etiological diagnosis of BSIs in thoracic transplant recipients, especially during the immediate post-transplant period when empirical antimicrobial therapy is also administered to the recipients.