Abstract

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Invasive fungal diseases (IFDs) are an increasingly common complication in critically ill patients in Europe and are frequently fatal. Because of changes in treatment strategies and the increased use of antifungal prophylaxis, the epidemiology of IFDs has changed substantially in recent years and infections due to Candida species are no longer the majority in many institutions. In contrast, the emergence of non-Candida IFDs such as aspergillosis, ucrmycosis and fusariosis has increased. Rates of IFD-related mortality in Europe depend on the pathogen, geographical location and underlying patient characteristics, with rates ranging from 28 to 59% for Candida infections and from 38 to 80% for invasive aspergillosis. Early initiation of antifungal therapy is critical for improving outcomes; however, this is complicated by the difficulty in diagnosing IFDs rapidly and accurately. Choice between agents should be based on a variety of factors, including spectrum of activity, adverse events, drug interactions, route of administration, clinical efficacy of individual agents and local epidemiology.

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Rapid saliva test for varicella zoster virus

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Abstract

Varicella zoster virus (VZV) is a ubiquitous human herpesvirus typically causing childhood varicella (chickenpox) at which time a life-long latent infection is established in ganglionic neurons throughout the neuraxis. Reactivation of latent virus, typically in the elderly and immunocompetent usually causes zoster (shingles) but can also result in serious neurologic disease. In cases of vasculopathy, meningencephalitis and myelitis where VZV is suspected, diagnosis requires detection of virus DNA or antibody in CSF. In collaboration with NASA, VZV DNA was found in saliva of health astronauts suggesting asymptomatic virus reaction due to the stress of spaceflight. This lead to a series of studies indicating virus DNA can be found in saliva of patients with VZV associated neurologic disease. With the goal of eliminating the need for lumbar puncture to diagnose VZV associated neurologic disease; we developed a rapid saliva test for the detection of VZV DNA in saliva that can be used in space as well as on Earth. Herein the test and its potential application will be present.

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Novel approaches for the supportive extracorporeal therapy of sepsis: Towards personalized treatment

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Abstract

Sepsis and sepsis-associated multiple organ failure are associated with extensive tissue damage caused by over-activation of the innate immune system and by the excessive release of inflammatory mediators. The development of targeted therapies for sepsis remains a major challenge due to the complex network of inflammatory mediators involved in the septic process.

Early detection and timely therapeutic intervention are crucial for improved outcome of patients with sepsis. Currently however, the diagnosis of sepsis and sepsis severity relies on clinical judgment. This often results in the severe heterogeneity of septic patients, the application of supportive extracorporeal therapies to modulate the concentration of inflammatory mediators requires diagnostic tools to monitor the inflammatory profile of the patients in order to identify the optimal time window for application of supportive therapies.

Here, we report on the development of extracorporeal adsorption systems for cytokine modulation and on the development and validation of a novel array technology to detect markers of inflammation (interleukins 6 and 10,