**Immunosuppressed patients – Infections, diagnostics and nosocomial transmission**

**Background** Lifesaving treatments in modern health care often imply immunosuppression, as treatment of hematologic malignancies and solid organ transplantations. These immunocompromised patients face the risk of opportunistic infections such as invasive fungal disease (IFD) and infections caused by bacteria in the environment, and are linked to high mortality. Our work aims to explore different aspects of infections in immunocompromised patients: 1. The diagnostic potential of a combination of biomarkers for IFD in high risk haematology patients. 2. The nosocomial spread and intervention of a metallobetalactamase producing pseudomonas aeruginosa (Pae-MBL) through hospital water sinks. 3. The diagnostic potential of heparin-binding protein (HBP), lysozyme and a panel of cytokines as infection biomarkers in broncheoalveolar fluid (BALF) of lung transplanted patients.

**Method** 1. A total of 135 hematologic patients with high risk for developing IFD were prospectively included at the haematology department in Lund and Gothenburg. Blood and urine samples were collected twice weekly for analysis of fungal biomarkers: betaglucan (BG), galactomannan (GM), gliotoxin and bis-methyl-gliotoxin in blood and d-arabinitol/L-arabinitol in urine. 2. A prolonged outbreak of Pae-MBL associated to hospital sink drains was investigated. Pae-MBL strains from patients and sinks were typed with pulse field gel electrophoresis and a new intervention with acetic acid once weekly was evaluated. 3. One hundred thirteen BALF samples from 29 patients were analysed for HBP, lysozyme and a panel of cytokines (IL-1-beta, IL-6, IL-10, IL-8 and TNF) and correlated to level of pulmonary infection.

**Results** 1. Thirteen patients with proven or probable IFD were identified. BG showed high diagnostic accuracy when used for targeted diagnosis and excellent specificity at levels >800 pg/ml. However, our results do not support the role of BG as a surveillance marker for early detection of IFD in this cohort of patients. 2. Typing of twelve patients and twelve sink drains showed the same bacterial strain. Acetic acid was highly effective against Pae-MBL biofilms, and may be used as a simple method to decontaminate sink drains and to prevent nosocomial transmission. 3. IL-1beta, IL-8 and HBP in BALF are useful biomarkers for the detection of pulmonary infection in lung transplant patients.
Acetic acid as a decontamination method for sink drains in a nosocomial outbreak of metallo-b-lactamase-producing Pseudomonas aeruginosa

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Prospective evaluation of a combination of fungal bio-markers for the diagnosis of invasive fungal infection in high-risk hematology patients.


Heparin-binding protein, Lysozyme and inflammatory cytokines in bronchoalveolar lavage fluid as diagnostic tools for pulmonary infection in lung transplanted patients

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