

P0046

Poster Session I

How to improve fungal diagnosis

A COMBINED SCREENING STRATEGY FOR INVASIVE FUNGAL INFECTIONS IN HIGH RISK HEMATOLOGY PATIENTS: EARLY COMPUTED THORACIC TOMOGRAPHY AND SERUM 1,3-BETA-D-GLUCAN

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Objective: Aimed to investigate the performance of early computed tomography (CT) combined with serum 1,3-beta-D-glucan (BDG) detection as a screening strategy for invasive fungal infections (IFI) in high risk hematology patients.

Patients and methods: Patients who had undergone chemotherapy for acute myelogenous leukaemia (AML), acute lymphocytic leukaemia (ALL), or allogenic stem cell transplantation (ASCT) with an expected neutropenia period longer than 7 days were included in the study.

During the study period, a total of 10 mL serum was sampled twice a week from the patients. 5 mL was submitted to the laboratory for galactomannan (GM) antigenemia test as the part of routine care and the other 5 mL was stored for BDG testing. Screening tests were started at the day of an absolute neutrophil count of $< 500/\text{mm}^3$ until recovery of neutropenia or diagnosis of IFI. GM (Platelia Aspergillus ELISA; Bio-Rad Laboratories), and BDG (Fungitell; Associates of Cape Cod, East Falmouth, MA, USA) were performed based on the manufacturers' instructions. The cutoff was set up as 80 pg/mL for BDG. In patients with radiologic evidence of IFI, but negative GM, the serum samples were re-tested by a modified methodology which was previously proven to increase the sensitivity.

Thoracic CT was performed in case of; GM index > 0.5 , any respiratory symptoms regardless of GM results, and persistent fever for 72-96 hours unresponding to broad spectrum antibacterial therapy. Sinus CT was performed in case of acute localized pain, nasal ulcer with black eschar or purulent nasal discharge.

IFI were categorized based on definitions of the European Organization for Research and Treatment of Cancer and Mycoses Study Group (regardless of BDG results).

Results: A total of 75 neutropenic episodes in 64 patients were prospectively followed between February 2012 and January 2013. IFI were detected in 15 patients (Probable Invasive Aspergillosis (IA) in 11 patients, possible IFI in 1 patient, sinusitis in 1 patient, and *Blastoschizomyces capitatus* fungemia in 1 patient, and non-albicans candida fungemia in 1 patient).

The sensitivity, specificity, positive and negative predictive values of BDG were as follows; 53.5% (95%CI 34.2-71.9), 76% (95%CI 70.8-80.9), 26.3%, and 73.6%. BDG was above commercially recommended cutoff in 7 (53.3%) out of 13 patients with IA while GM index obtained by standard methodology was above 0.7 in 4 (30.7%) out of 13. BDG was above 80 pg/mL at an average of one week before the blood cultures were available in patients with fungemia. CT was triggered by persistent fever in all patients. Detection of biomarker positivity and radiologic findings of IA was synchronous in all but one patient.

Conclusion: Early thoracic CT combined with serum BDG detection can appropriately diagnose the patients with IFI.

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