mgarreta@catlab.cat

Evaluation of the performance of β-D-glucan for invasive fungal infection

M. Garreta [1], E. Padilla [1], J. Trenado [2], D. Rodriguez [3], M. Navarro [1], A. Ruiz [1], A. Boronat [1], L. Brusca [1], J. Perez [1].
[1]Microbiology, CatLab - Viladecavalls (Spain), [2]Hospital Mútua de Terrassa - Terrassa (Spain), [3]Hospital de Terrassa - Terrassa (Spain)

Introduction

Emerging fungal biomarker detection techniques have revolutionized the diagnosis of invasive fungal infections (IFI) over the last decades.

Objectives

The purpose of this study is to evaluate the utility of BDG in comparison to other fungal biomarkers in the diagnosis of patients with suspected invasive fungal infection.

Material and methods

We performed a retrospective observational study conducted among two hospitals: Hospital Universitari Mútua de Terrassa and the Consorci Sanitari de Terrassa. Patients under suspicion of IFI were included from February 2022 to March 2022.

The microbiological diagnosis of IFI was carried out by fungal biomarker screening: real-time quantitative PCR (*Pneumocystis* ELITe MGB) in bronchoalveolar lavage fluid (BALF) for *P. jirovecii* pneumonia (PCP); detection of galactomanane antigen (GM) (*Aspergillus* galactomanane ag, Virclia, Vircell) in BALF and serum for invasive aspergillosis (IA); conventional culture was performed for IA and invasive candidiasis (IC). Serum β-D-glucan (BDG) (Fujifilm-wako-Vircell) was performed on all samples.

The diagnostic performance of the BDG test was evaluated separately and together with other biomarkers.

Results

A total of 51 patients were included in the study (68% were men, median age 66 years old), and 28 of them were immunocompromised (54.9%). Probable IFI was diagnosed in 11 patients, of whom 10 were immunocompromised.
Within the 40 patients who were not diagnosed with IFI, 11 antifungal treatments were discontinued based on microbiological findings.

Table 1. Biomarkers Sensitivity, Specificity, Positive Predictive Value, and Negative Predictive Value

	Tests	Sensibility	Specificity	PPV	NPV	Pos. Likehood ratio[d]	Neg likehood ratio[d]
Overall	qPCR[a] + GM[b]	0.64	0.95	0.78	0.90	12.73	0.38
	BDG[c]	0.80	0.82	0.53	0.94	4.57	0.24
	All biomarkers	0.91	0.78	0.53	0.97	4.04	0.12
Immunosuppressed	qPCR[a] + GM[b]	0.70	0.89	0.78	0.84	6.30	0.34
	BDG[c]	0.78	0.83	0.70	0.88	4.67	0.27
	All biomarkers	0.9	0.72	0.64	0.93	3.24	0.14

[a]*P. jirovecii* qPCR, [b]Galactomanane, [c]β-D-glucan, [d](LRs of >10 or <0.1 have significant impacts on diagnosis).

Conclusions

- The combined use of different biomarkers would improve sensitivity and specificity in the diagnosis of IFIs.
- New biomarkers should be incorporated into the routine diagnosis of IFI in order to enhance patient management and reduce the need for unnecessary antifungal treatments.

33rd ECCMID EUROPEAN CONGRESS OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES
Copenhagen, Denmark
15–18 April 2023