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The significance of combination detection of Candida mannan and antibody lateral flow assay for invasive candidiasis diagnosis

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Background: Invasive Candidiasis disease is becoming a most serious Invasive Fungal Disease (IFD) categories. Nowadays, (1,3)- β -D-Glucan (BG) Test is one useful method for IFD diagnosis and has been recommended by EORTC/MSG. However, BG test is used for pan-fungal detection and cannot distinguish the type of infection, the exact diagnosis must be confirmed by blood culture or imaging. Thus, the diagnosis of candidiasis remains challenging. In this study, the diagnostic value of combination detection Candida mannan and antibody lateral flow assay for invasive candidiasis diagnosis was evaluated.

Methods: All adult patients who were diagnosed with candidiasis whose blood samples were available were enrolled in Zhejiang Provincial People's Hospital, between January 2020 and December 2020. The serum levels of Candida-specific IgG, IgM and mannan (MN) were measured simultaneously by FungiXpert[®] Candida IgG, IgM and mannan lateral flow assay.

Results: A total of 105 patients were enrolled in this study, including 42 candidiasis patients, 63 non-IPA patients. The sensitivities and specificities of Candida-specific IgG, IgM tests and MN test were 78.5% and 50.8%, 88.9% and 79.4%, 50.0% and 82.5% respectively. And the sensitivity and specificity of combination detection of the three tests is 90.4% and 87.3%.

Conclusions: In the process of intermittent release of mannan antigen into the blood, it is easily cleared by phagocytes in the blood and is not easily captured during the detection. Therefore, the specificity of MN detection is higher, but the sensitivity is lower. However, after Candida infection, as long as the antigen does not disappear, the antibody can exist in the serum for a long time. Therefore, the Candida antibody detection test can effectively avoid the shortcomings of the MN test, and the combined detection can highly improve the detection accuracy. Due to the short run time, simplicity, and limited resources needed, combination detection of Candida antibody and antigen lateral flow assay is a good solution for candidiasis diagnosis in resource-constrained settings.