9th Advances Against Aspergillosis and Mucormycosis
Palazzo dei Congressi Lugano, Lugano, Switzerland
27 – 29 February 2020

Local experience feedback on performing routinely the Mucorales qPCR on blood samples in hematological patients.

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Purpose

Our centre has been applying a strategy of Invasive Mold Inefction (IMI) screening on blood samples, including systematically the Mucorales qPCR (in-house technique).[1,2,3] The aim of this study was to describe the IMI with positive Mucorales qPCR, detected in the past five years, thanks to this local strategy.

Methods

A fungal screening strategy is applied systematically in our center for at risk patients followed in the Hematology Units (induction treatment, GVHD, HSCT, feverish aplasia, imagery signs). This screening include the galactomannan antigen detection, the *Aspergillus fumigatus* qPCR and the Mucorales qPCR. An extration was performed over the period **January 2015 and January 2020** to study specifically the cases with at least **two successive positive Mucorales qPCR.**

Results

A total of 3086 IMI screening were performed over the 5 years period studied. **Twenty-three IMI cases** with 2 successive positive Mucorales qPCR were collected. Based on EORTC criteria,[4] there were 2 proven cases of mucormycosis and 21 cases of IMI with positive Mucorales qPCR. The number of IMI cases with positive Mucorales qPCR increased progressively during the 5 years period studied (Figure 1).

A majority of the patients were diagnosed with acute myeloid leukemia (AML) (74%), and 76% were HSCT recipients. Broncholaveolar-lavage fluids (BALF) were only performed in 26% of the cases, with compatible imagery and positive Mucorales qPCR on blood samples. The Mucorales qPCR was positive on BALF in 33% of the cases.

The probe detecting the genus **Mucor& Rhizopus** was the most frequently positive (52%), closely followed by the probe detecting the Rhizomucor genus (39%) (Figure 2). The positive Mucorales qPCR allowed immediate liposomal amphotericin B prescription. The Mucorales qPCR became negative **within a median of 6 days [range 2-45]** (Figure 3).

In 26% of the cases (6/23), another IMI was diagnosed concomitantly to the positive Mucorales qPCR: 1 proven Fusariosis and 5 probable invasive aspergillosis, based on the recently revised EORTC criteria.[5] In all these mixed IMI cases, without the Mucorales qPCR result, the patients would have been treated with voriconazole only. Here, 4 out of 6 patients with mixed IMI were still alive, 6 months after the diagnosis (67%). Surgery was performed only for the proven mucormycosis cases (9%). The overall survival rate was 61%.

Figure 1

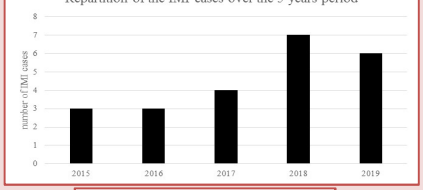


Figure 2

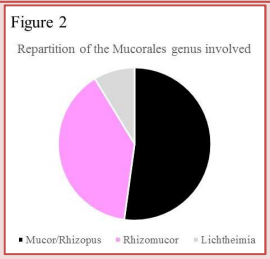
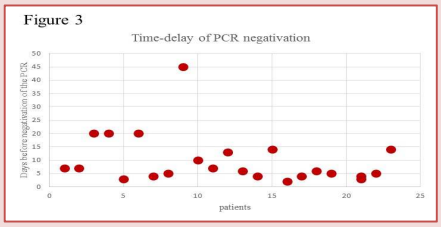


Figure 3



Conclusion

Cliniciens sometimes added the Mucorales PCR analysis on BALF, in addition to the result on sera, which was evaluated for this Mucorales in-house qPCR.[6] The positive Mucorales qPCR was associated with earlier appropriate therapeutic management with liposomal amphotericin B. This local feedback experience illustrate the efficiency of screening early development of IMI, mixed or not, using non-invasive samples.

References

1. Millon *et al*., 2016, Clin Microbiol Infect; Bellanger *et al*., 2018, Bone Marrow Transplant; Millon *et al.*, 2019, J Fungi; 4. De Pauw et al., 2008, Clin Infect Dis. 5. Donnelly et al. 2019, Clin Infect Dis. 6.Scherer et al., 2018, J Clin Microbiol.