

Fungal infections in patients with COVID 19 Retrospective study on 65 cases

P30

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introduction

Patients hospitalized with COVID-19 have a high incidence of secondary infections. We sought to assess the occurrence of fungal superinfections in patients with severe COVID-19.

methods

We conducted a retrospective observational study of COVID-19 patients who were tested for invasive fungal infections (IFI) between 2020 and 2021 in the laboratory of mycology at Farhat Hached teaching Hospital.

Results and discussion

We received a total of 188 samples collected from 65 patients admitted for severe COVID-19. The patients were predominantly male (n=41, 63.1%) and had a median age of 62.7 years (range 1-87 years).

The samples came mainly from the intensive care unit ICU (91.4%) followed by infectious diseases department (3.7%) and pediatric department (3.2%). The following predisposing factors for IFI were recorded: intensive care unit stay, broad-spectrum antibiotic therapy, diabetes and invasive procedures (Table 1).

Table 1: Predisposing factors for IFI in COVID-19 patients

predisposing factors	number	percentage
intensive care unit stay	54	83 %
broad-spectrum antibiotic therapy	31	48 %
diabetes	8	12 %
invasive procedures	4	6 %
Immunosuppressive therapy	3	4.6%

Authors found that critically COVID-19 patients, especially those who were admitted in ICU and required mechanical ventilation or with immunocompromised state were more likely to develop fungal co-infection [1,2].

The majority of samples were referred for fungal colonization screen. This particular attention to the probability of fungal infections in COVID-19 patients was based on the experience of SARS in 2003 and the cases of invasive aspergillosis combined with severe influenza[1].

Only 18 samples were collected from deep sites to diagnose IFI, of which 7 were positive. These were pleural puncture (3), bronchoalveolar fluid (2), blood culture (1) and cerebrospinal fluid (1).

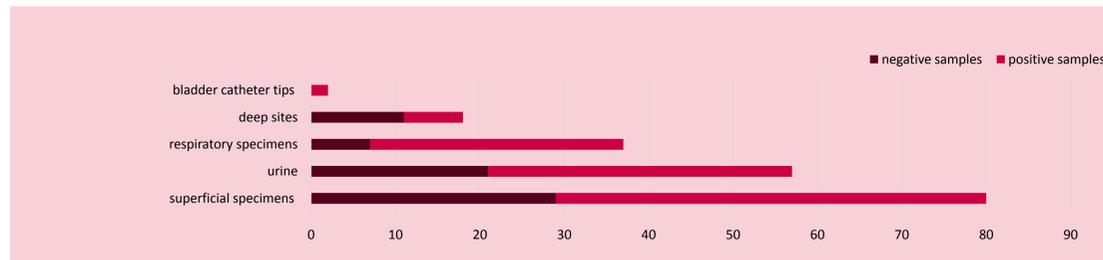


Figure 1 : nature of specimens

The rate of positivity of direct examination was 42.2%. Culture was positive in 67% (Figure 1). The culture recuperated 42.6% of the samples with negative direct examination.

A total of 133 fungal isolates were found in the 126 positive samples. The species are represented in figure 2.

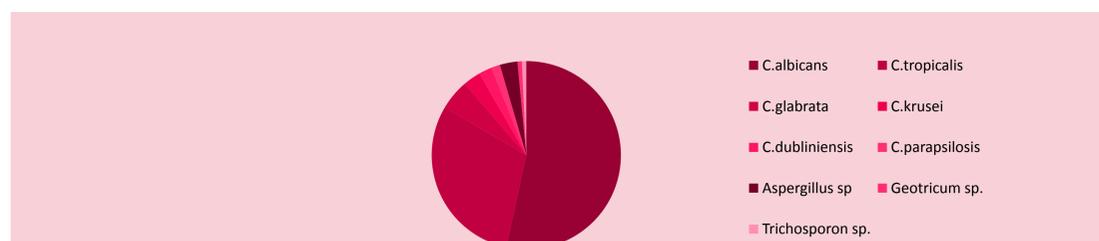


Figure 2 : species distribution

Only four patients (6.15%) had a mold positive culture of their samples. We identified 4 species of *Aspergillus*: *A. flavus*, *A. oryzae*, *A. parasitocus* and *A. terreus*.

As for *Candida*, *C. albicans* was the most frequently isolated species (55.9%) followed by *C. tropicalis* (31.5%), *C. glabrata* (5.5%), *C. krusei* (3.1%), *C. dubliniensis* (2.4%) and *C. parapsilosis* (1.6%). Other studies found systemic candidiasis due to *C. albicans* to be the most frequent invasive fungal infection in COVID-19 patients. [3]

Antifungal susceptibility testing was performed on 21 strains of *Candida*. They were susceptible to Amphotericin B, Voriconazole and Fluconazole respectively in 100%, 70% and 60%.

Conclusion

Severe COVID-19 patients have multiple risk factors to develop fungal infections. Systematic screening seems to be necessary for the early diagnosis of invasive fungal infection.

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