Prolonged mechanical ventilation support was associated with the development of nosocomial candidemia and bacteremia. Parallel to the development in the field of diagnosis and treatment, an increase in the incidence of fungal infections and the number of patients who are in the risk group for the development of opportunistic fungal infections have been observed in recent years. Among the hospitalized patients, those most at risk in terms of fungal infections are intensive care unit (ICU) patients. The care of Candida infections amongst critical care patients is very important and may save serious morbidity if not diagnosed, treated, and handled effectively, and promptly.
Objective: Mycetoma is a neglected tropical skin disease, caused by 70 different causative agents. For most of the causative agents, molecular identification is the only reliable method to identify the species level. In practice, ultrasound, histopathology, cultivating, and species-specific PCRs are most commonly used for species identification. However, the performance of these different tests was not validated using molecular identification by sequencing barcoding genes.

Methods: In this study, we validated the performance of the most commonly used diagnostic tools including culture, histopathology, ultrasound and two species-specific PCR for Madurella mycetomatis on 222 patients suspected of fungal mycetoma by M. mycetomatis; the sensitivity, specificity, and accuracy of each method were calculated.

Results: From the 222 patients, 174 (62.3%) were correctly identified by ultrasound, histology, culture, and both species-specific PCRs. For five patients all tests were negative and for three only the ultrasonic was indicative of mycetoma. For the other 69 patients, at least one of the assay was negative for M. mycetomatis. The two species-specific PCRs were the most sensitive and specific, followed by culture and histology. Ultrasound was the least specific as it only allows to differentiate between actinomycetoma and mycetoma. However, with ultrasound, an identification could be obtained in 9.38 min. PCR took 1.74 h, histology 8.5 days, and culturing 21 days.

Conclusions: We concluded that PCR directly on DNA isolated from granules is the most rapid and reliable diagnostic tool to identify M. mycetomatis from mycetoma granules to use species-specific PCRs. In order to shorten the time to identification of other causative agents, the focus should be on developing more molecular assays for these species.

References:

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Objective: Due to the ongoing COVID-19 pandemic, a new group of patients at risk emerged with COVID-19-associated mucormycosis (CAM) and other fungal infections. Molecular studies, evaluating the prevalence of CAM and other fungal infections are lacking. To assess CAM prevalence in a super-specialty healthcare hospital in North India, we applied direct microscopic fungal culture, and quantitative real-time PCR targeting Mucorales-specific fragments on tissue specimens of critically ill COVID-19 patients.

Methods: This was a hospital-based prospective study during second wave of COVID-19 in India. All clinically suspected CAM patients with a history of COVID-19 were included in the study from March 2021 to June 2021 where tissue or biopsy specimens were collected under aseptic conditions. Conventional identification methods were performed for all isolates, specimen was done by MALDI TOF and comparative detection by RTPCR was also done.

Results: In the present study, among 67 samples received in the laboratory from clinically suspected CAM patients, 52 samples showed positive growth using the conventional method of identification. Rhizopus arrhizus was the commonest fungal isolate obtained followed by Aspergillus flavus from tissue samples. Use of molecular and automated machines helped in the early identification of these species 24-48 h less than the conventional methods. Polyfungal isolates are also reported from two tissue samples of patients in the post-COVID discharge stage. Almost 95% of patients with CAM and other fungal etiology agreed to steroid intake and diabetes condition during COVID-19 infection.

Conclusions: Considering the ever-evolving strains and variants of COVID-19, it is important to have a high index of suspicion for fungal infections in patients with COVID-19 presenting with complications. Further, there should be immediate molecular studies with an emphasis on the requirement of medical or surgical intervention if the result comes positive. There is a need to stress on the judicious use of steroids to avoid flaring up of the fungal infection.