Objective: This study aimed primarily to determine the etiology, characteristics, and comorbidities of patients with rhino-orbital-cerebral mucormycosis. Secondary, antifungal susceptibility pattern of the isolates and linkage by ITS-sequencing was also studied.

Methods: The study was conducted from May to December 2021 in all suspected cases of rhino-orbital-cerebral mucormycosis in post-COVID-19 patients or a setting in which patients with COVID-19 infections, clinical fevers, comorbidities, and outcomes were collected after obtaining informed consent from patients.

Results: Speciation of Rhizopus spp. was done using the proposed code Macrol and diagnosis of COVID-19 was done based on real-time polymerase chain reaction (RT-PCR test). In the Mount Mount examination, fungal and histopathological examination was performed on samples collected endoscopically or post-debridement. Mucormycosis was proven based on fungal culture, specific histologic features, and formalin-fixed, paraffin-embedded (FFPE) tissue samples. In vitro susceptibilities profiles for antifungal drugs by CLSI-mutual diffusion test were obtained. A total of 70 patients were diagnosed with mucormycosis. Rhino-orbital and cranial comorbidities were identified in 57.1% of cases. Diabetes mellitus (DM) was present in 91.5% patients while 78.5% of the patients were treated with corticosteroids in past or current, and 23.7% presented with acute COVID-19 pneumonia. Most cases showed onset of symptoms of mucormycosis between 29 ± 17 days from diagnosis of COVID-19. Imaging, on the other side, was involved in 12.8% and mortality was in 57.1% patients. Diagnosis of mucormycosis was established on ORO digital microscopy 68.6%, cultured 47.4%, histopathology 57.5%. Isolates obtained were Rhizopus oryzae (62.4%), Aspergillus flavus (10.5%), and Aspergillus niger (8.0%) while mixed infection was seen in 4.3%. The MIC90 and MIC50 of amphotericin B for RH. oryzae strains were 0.25 ± 0.4 μg/mL, and MIC90 and MIC50 results for itraconazole, posaconazole, and voriconazole were 2.0 ± 2.0 and 0.2 ± 0.2 and 0.2 ± 0.2 μg/mL respectively. Amphotericin B was susceptible to amphotericin B (100%), itraconazole (95%), voriconazole (90%), and caspofungin (90%). Overall treatment included intravenous amphotericin B along with functional endoscopic sinus surgery (FESS)/paranasal sinus (PNS) debridement in 62.8%, oral extension in 42.8%, orbital decompression in 11.4%, and partial maxillary in 22.8%. Intravenous administration of itraconazole was administered in 22.8%, oral administration, mortality was 37.7%. In vitro MICs showed that amphotericin B was the most active compound against most species.

Conclusion: This study minimizes the diagnostic delay, and appropriate management of mucormycosis can improve survival. Rational use of oral and intravenous drugs in diabetic patients can prevent recurrence of mucormycosis. Use of methods for antifungal susceptibility testing to guide antifungal treatment may be clinically useful in cases of treatment failure.

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A clinimicrobial study of dermatophyte infection including antifungal susceptibility testing in children attending a tertiary care hospital in north-western state of Rajasthan

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Objective: To determine the prevalence of dermatophyte infection including antifungal susceptibility testing in children attending a tertiary care hospital in north-western state of Rajasthan.

Materials & Methods: A total of 100 patients attending Dermatology and Venereology outpatient department during the period of December 2019-October 2020 were enrolled under this study. The samples were subjected to KOH preparation, culture and histopathology examination, and identified by standard techniques at the mycology section of department of dermatology. Antimicrobial susceptibility testing was performed by Microbroth dilution per CLSI guidelines (M38-A2) with the following drug concentrations: AMB (0.02, 0.06, 0.5, 1, 5, 10, 25, 50, 100 μg/ml), Fluconazole (0.125, 0.25, 0.5, 1, 2, 4, 8, 16 μg/ml). The broth microdilution method was performed in an automated microtiter plate. For resulting MICs, we have classified into sensitive, intermediate, and resistant categories.

Results: In the culture, collection of cultured samples and histopathology examination, we found dermatophyte infection in 76% (94/125) patients, which were classified as sensitive (20%), intermediate (18%), and resistant (44.4%). Antifungal susceptibility results are shown in Table 1.

Conclusion: It is important for clinicians to emphasize upon microbiological diagnosis of dermatophytes as these infections have many mummies, highlighting the need for confirmation by culture. High prevalence of dermatophyte resistance in both T. rubrum and T. mentagrophytes is of clinical importance and highlights the need to routinely perform antifungal drug susceptibility testing as a necessary adjunct to treatment and for surveillance.