

Original Article

OCULAR FUNGAL INFECTIONS IN COVID-19 PATIENTS: EARLY REPORT
FROM EGYPT

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Abstract

Purpose: the aim of this study is to evaluate the occurrence of Mucromycosis in the eyes of Covid-19 patients, evaluating risk factors, presentation, treatment, and the fate of these cases.

Patients and methods: an observational cross-sectional study involved adult COVID-19 patients in our institute in the period from 1st July 2021 till 30th July 2021, the risk factors for fungal infections were identified; the patients were examined by otolaryngology specialist, full ophthalmological examination was done using portable slit lamp and indirect ophthalmoscopy. CT scan was done in Mucromycosis positive patients to assess the invasion and to take treatment decision.

Results: 1270 patients were examined, 604 (47.6%) males and 666 (52.4%) females, the mean age was (56.5±3.2) years, we diagnosed 5 patients with Mucromycosis; clinically and laboratory (using fungal culture). The group included 5 patients with +ve laboratory investigations for Mucromycosis the mean age±SD was (59±2.24) with 3 (60%) were males and 2 (40%). 4 (80%) patients were diabetics, 3 (60%) patients were asthmatic, 3 (60%) patients were on ventilators, 2 (40%) patients had renal failure, 2 (40%) patients had cardiac diseases and 2 (40%) patients had malignancies. death rate was(60%). They presented by different ocular manifestations including blurring of vision, proptosis, disc edema, or necrotic tissue. They were treated by antifungals and surgical intervention in the form of debridement or even orbital exentration.3 of them died due to systemic complications and 2 responded to surgical debridement with antifungals. **Conclusion:** Mucromycosis occurs in COVID-19 patients especially those with immunocompromizing diseases, aggressive treatment is needed, the death rate is high (60%)

Keywords: COVID-19, Mucromycosis, Immunocompromized, Ocular, Egypt

1. Introduction

Mucromycosis is one of the commonest invasive fungal diseases, it's a member of Mucorales family which is an opportunistic infection; its incidence worldwide range from 0.005 to 1.7/million population, it's lethal and affects immunocompromized

patients including: uncontrolled diabetics, those with organ transplantation, patients with malignancy, burns, or severe trauma. It has a high mortality and morbidity rates. It could be presented in different parts of the body such as lungs, gastrointestinal tract,

skin, nasal sinuses, and eyes; leading to severe complications. It can be transmitted by contact with mud or contaminated materials or inhalation of spores [1-4]. Most of COVID-19 patients have other comorbidities such as diabetes mellitus, renal failure, malignancy, or organ transplant. These factors increase the immunodeficiency risk leading to lethal sequences [5,6]. The protocol for COVID-19 patients includes steroids which lead to immunodeficiency and many patients need oxygen supplementation either with or without mechanical ventilation. This could lead to occurrence of such opportunistic infection [7,8]. Ocular affection of Mucromycosis is dangerous and may lead to blindness due

to exentration or even the more serious the extension to the brain which is lethal. Ocular manifestations of the eye include chemosis, ptosis, proptosis, ophthalmoplegia and/or drop of vision. Its extension starts from ethmoidal sinuses due to thin lamina papyraciea to the orbit, if it extends to the brain, conscious level disturbance occur with many neurological symptoms and death. Its invasion through blood vessels is common causing black eschar with formation of extensive necrotic areas [9-11]. In this study we aim to evaluate the incidence of Mucromycosis in the eyes of Covid-19 patients in our institute, evaluating risk factors, presentation, treatment, and the fate of these cases.

2. Patients and Methods

Study design: an observational cross sectional study involved adult COVID-19 patients in our institute in the period from 1st July 2021 till 30th July 2021, the risk factors for fungal infections were identified; the patients were examined by otolaryngology specialist, full ophthalmological examination was done using portable slit lamp and indirect ophthalmoscopy. CT scan was done in Mucromycosis positive patients to assess the invasion and to take

treatment decision. A treatment protocol was started after full investigations including sinus endoscopic drainage and debridement, antifungal Amphotericin B 300 mg/day was used intravenously; surgical debridement of necrotic tissue under local or general anesthesia was done when indicated. Debrided tissue was examined by tissue culture sabaroud's agar at 30° and examined microscopically after staining with lactofuchsin.

3. Ethical considerations

Full ethical considerations were followed and comprehensive written informed consent was taken from all involved patients in this study. Our study adhered to the tenants of Helsinki and the ethical board committee approval of our institution

(Assiut Faculty of Medicine with IBR number: 17300619) was obtained .This study did not include children and the patients did not bear any expenses for the investigations or intervention.

4. Results

1270 patients were examined, 604 (47.6%) males and 666 (52.4%) females, the mean age was (56.5±3.2) years, we diagnosed 5 patients with Mucromycosis; clinically and laboratory (using fungal culture). The characters of these patients are shown in tab. (1). The group included 5 patients with +ve laboratory investigation s for Mucromycosis the mean age±SD

was (59±2.24) with 3 (60%) were males and 2 (40%). 4 (80%) patients were diabetics, 3 (60%) patients were asthmatic, 3 (60%) patients were on ventilators, 2 (40%) patients had renal failure, 2 (40%) patients had cardiac diseases and 2 (40%) patients had malignancies. Patient 1 presented by necrotic tissue around the eye, proptosis and chemosis. He received

IV antifungal with local debridement of necrotic tissues. Patient 2 presented by headache, chemosis and blurred vision <6/60. He received IV antifungal with endoscopic drainage of sinuses. Patient 3 presented by chemosis and swollen disc and received IV antifungal. Patient 4 presented by headache, necrotic tissue around the eye, proptosis,

blurred vision <1/60 and chemosis. He received IV antifungal with local debridement of necrotic tissues. Patient 5 presented by necrotic palate, proptosis and chemosis. He received IV antifungal with endoscopic drainage of sinuses. 3 (60%) patients sadly ended with death. The presentation of the cases is shown in figs. (1, 2, 3, 4, 5)

Table 1: Showing the characters of patients with Mucromycosis

Patient	1	2	3	4	5
age	62	60	59	58	56
sex	male	female	female	male	male
Risk factors	diabetic	diabetic		diabetic	diabetic
	--		asthmatic	asthmatic	asthmatic
	--	cardiac			cardiac
	Renal failure leukemia		Renal failure	Cancer bladder	
	ventilator		ventilator		ventilator
Presentation	-Necrotic tissue around the eye -Proptosis -Chemosis	-Headache -Chemosis -Blurred vision <6/60	-Swollen disc -Chemosis	-Headache -Necrotic tissue around the eye -Proptosis -Blurred vision <1/60 Chemosis	-Necrotic palate -Proptosis -Chemosis
Laboratory diagnosis	+ve	+ve	+ve	+ve	+ve
management	Intravenous antifungal local debridement exentration	Endoscopic drainage of sinuses Intravenous antifungals	Intravenous antifungals	Local debridement Intravenous antifungals	Endoscopic drainage of sinuses Intravenous antifungals
fate	death	resolved	death	resolved	death



Figure 1: Showing blackening of skin with edema



Figure 2: Showing the necrotic palate

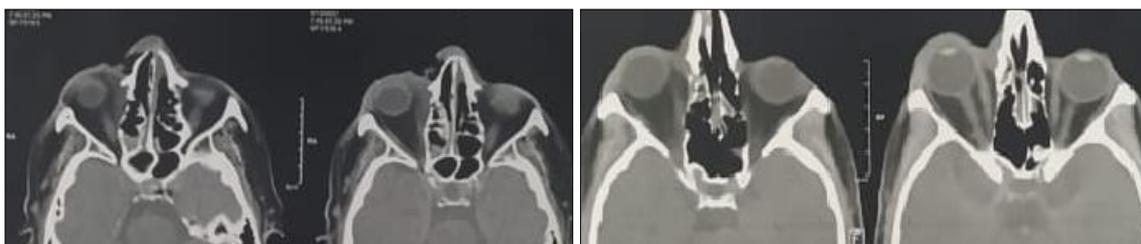


Figure 3: CT orbit with proptotic eye



Figure 4: Endoscopic view of Escher to the left and healed mucosa after medial maxillectomy to the right



Figure 5: Showing left orbital exentration

5. Discussion

Mucromycosis is a dangerous infection aroused again with serious sequel in patients with COVID-19 infection. Immunodeficiency is the main risk factor; most of COVID-19 patients are immunocompromized due to other comorbidities [12]. The affected patients with fungal infections in this study were immuneocompromized due to uncontrolled diabetes, malignancy, renal failure, or hepatic failure. The steroids which are included in the treatment protocol of COVID-19 patients contribute to immunodeficiency and increase the risk of infection [13]. These risk factors increase the risk of infection and raise the chance of death due to associated complications. Two patients were on ven-

tilator and this could be a risk factor due to humidity or contamination. The death rate is 60% which is comparable to other studies due to the aggressive nature of the infection with decreased immunity. The death rate could be due to fungal infection and augmented by COVID-19, so further studies could differentiate [14]. The intervention in the management of such cases must be rapid and aggressive in the form of intravenous antifungals, local debridement, or even orbital exentration to avoid the spread of the infection to the brain. High suspect index could save life, especially with patients with risk factors which necessitate meticulous otolaryngeological and ophthalmological examination.

6. Conclusion

Mucromycosis occurs in COVID-19 patients especially those with immunocompromizing diseases, aggressive treatment is needed, the death rate is high.

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