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LETTER TO THE EDITOR

WILEY

Mucormycosis in post-COVID-19 renal transplant patients: A lethal complication in follow-up

Dear Editors,

Post-COVID-19 mucormycosis has been exclusively reported in general population,[1] but the data are scarce in transplantation.[2,3] Herein, we report two cases of post-COVID-19 mucormycosis (Table 1) in renal transplant recipients who were admitted at IKDRC-ITS which is a high-volume transplant center in India. The first case was a 47-year aged gentleman transplanted 17 years ago. He developed diabetes 1.5 years back and was on oral hypoglycemic drugs (OHA) with well-controlled blood sugars. His baseline serum creatinine was 1.08 mg/dl. He developed a fever for 3 days and was admitted as mild-COVID-19 for 7 days. Post-discharge, he developed swelling over the face and was admitted with this complaint on the seventh post-discharge day. On examination, the patient had a black nasal discharge. MRI-PNS showed invasive sinusitis of left orbital, left pre-maxilla and infratemporal fossa cellulitis with minimal dural enhancement in the left middle cranial fossa. Due to the clinical deterioration, surgery was performed on the 40th day. The patient underwent an extensive surgical correction in the form of left maxillectomy with left orbital exeneteration with left zygotomy with nasal septum removal and palate reconstruction with temporal flap. The patient succumbed on the 51st day from the onset of COVID-19. The second case was a 25-year aged young man

TABLE 1 Summary of the two cases

	Patient 1	Patient 2
Baseline characteristics		
Age/sex	47/Male	25/Male
Comorbidities	HTN × 20 years; DM × 1.5 years (good glycemic control)	HTN × 3 years; NODAT × 1 years on Insulin + OHA (good glycemic control)
Native kidney disease	Hypertension	Unknown etiology
Time from transplant to COVID-19	LRKT 17 years	LRKT 2 years
Induction	No induction	Thymoglobulin
History of antirejection therapy	No	No
Baseline immunosuppression	Steroids, tacrolimus	Steroids, tacrolimus, Mycophenolic acid
Tacrolimus levels, ng/ml	4	5.6
Baseline serum creatinine	1.08 mg/dl	1.8 mg/dl
COVID-19 severity	Mild	Mild
Treatment received for COVID-19	Supportive, No oxygen or steroids	Home, no oxygen or steroids
Presenting symptoms	Frontal Head ache for 4 days	Fever, cough with black expectoration, and difficulty of breathing for 2 days
Cumulative clinical examination findings	Facial edema, facial tenderness, propotosis, chemosis, no vision, parasthesia, black crusting in nose and palate.	Bilateral crepitations with bronical breathing in the middle zone of right lung.
Radiology	MRI-PNS: Residual invasive sinusitis (left orbital, Left pre-maxilla, infratemporal fossa). Cellulits of maxillary sinus with normal brain (post first debridement). CT Brain: Changes of cellulitis over Left maxillary region with rectus myositis. Mild sinusitis in Right maxillary, Left frontal sinus, Left sphenoid and Bilateral ethmoid sinusitis and normal brain.	HRCT thorax: Groun glass opacity at the time COVID-19 to Caviatory pneumonia Right lung, which progressed sequentially involving bronchial artery.
Diagnosis confirmation	Rhino orbital mucormycosis by HPE + biopsy	Pulmonary mucormycosis by BAL + biopsy

(Continues)

TABLE 1 (Continued)

	Patient 1	Patient 2
Surgery performed	Left maxillectomy + left orbital exenteration + left zygotomy + nasal septal renewal + temporal flap palate reconstruction	Lobectomy planned but died before surgery.
Outcome of the cases		
Acute kidney injury	Yes	Yes
Acute kidney injury requiring hemodialysis	Yes	Yes
Acute respiratory distress syndrome	Yes	Yes
Mechanical ventilation	Yes	Yes
Shock	Yes	Yes
Death	Yes	Yes
Time line of the cases		
Onset of symptoms to SAS-CoV2 RT-PCR positive report	4 days	3 days
Duration from positive to negative SAS-CoV2 RT-PCR report	11 days	5 days
Hospitalization duration for COVID-19	10 days	At home
Duration from no COVID-19 symptoms to onset of mucormycosis symptoms	4 days	10 days
Duration from onset of mucormycosis symptoms to hospitalization	4 days	2 days
Days between onset of symptoms to initiation of Liposomal amphotericin B	5 days	2 days
Duration from hospital admission to first local debridement and surgery	4th day and 18th day	Not applied
Duration from hospital admission to death	33rd day of admission	29th day of admission
Duration from onset of COVID-19 symptoms to death	51 days	49 days

Abbreviations: BAL, bronchoalveolar lavage; COVID-19, coronavirus disease; DM, diabetes; HPE, histopathology of nasal specimen; HTN, hypertension; LRKT, live-related transplantation; OHA, oral hypoglycemic drugs; RT-PCR, real-time polymerase test; SARS-CoV2, severe acute respiratory syndrome coronavirus 2.

transplanted 2 years back. He had a baseline creatinine of 1.8 mg/dl. He was diabetic for 1 year with good glycemic control. He was tested COVID-19 positive and was managed at home. After 10 days of resolution of COVID-19 symptoms, he developed fever, cough, and black expectoration. He underwent broncho-alveolar lavage with biopsy and was detected with mucormycosis. He was given IV amphotericin B since the day admission, yet succumbed on the 49th day from the onset of COVID-19 symptoms. Both the cases required hemodialysis, and both developed acute respiratory syndrome before death.

A recent systemic review[1] has shown an association of COVID-19 with mucormycosis, bulk of which is reported from India. The overall incidence of mucormycosis in renal transplants was 1.2% in a previous report from India.[4] With a surge of mucormycosis in COVID-19 era, the transplant community should be aware of the possibility of rise in mucormycosis cases, as they are highly vulnerable to such rare infections. The chances of acquiring mucormycosis in organ transplant patients are higher due to chronic immunosuppression and comorbid conditions like diabetes.[1] Henceforth, transplant patients with COVID-19 must have a thorough clinical assessment to rule out mucormycosis. These patients should also be instructed to look for any signs at home after discharge. Interestingly, both of our cases had mild-COVID-19, well-controlled sugars, and early administration of amphotericin B yet both of them died. In the COVID-19 pandemic where health resources are already overwhelmed, multidisciplinary management becomes a daunting task. In conclusion, the management of mucormycosis in the COVID-19 era proved extremely difficult and was associated with high mortality. Further reports of post-COVID-19 mucormycosis in transplant settings will help the transplant physicians in better understanding the spectrum of post-COVID-19 sequelae.

CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTION

All have contributed equally for preparation of the manuscript.

DATA AVAILABILITY STATEMENT

Data available from the corresponding author on reasonable request.

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