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Post COVID Mucor Mycosis and its Complications- Case Series of 3

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Abstract: ***A wide range of bacterial and fungal infections have been associated with COVID in recent times. People are suffering each day now that the disease is endemic in many countries. Mucor mycosis is one of the most feared associations of COVID related disease with high mortality. It is one of the most rapidly progressing and fulminant forms of fungal infection which usually begins in paranasal sinuses and nose following inhalation of fungal spores. It is caused by subphylum Mucormycotina. Commonly this infection is seen in an immunocompromised patient. Early detection and prompt action is the key to this life-threatening disease.***

Keywords: COVID, mucormycosis, white fungus, black fungus, COVID symptoms, COVID complication

1. Introduction

It is now well known that COVID-19 is a viral infection of the respiratory tract. Common symptoms being fever, dry cough, shortness of breath and in severe conditions, ARDS (acute respiratory distress syndrome). Corticosteroids are largely used in modulating lung injury and reduce mortality in COVID-19 patients. But it also exposes the patient to opportunistic infections. Infection such as mucor mycosis, aspergillosis can progress rapidly in these patients. We are presenting 3 cases of mucor mycosis post COVID, including its management, its consequences and repercussions.

2. Case Presentation

Case No.1

A 35-year-old gentleman, diabetic COVID survivor was brought to the emergency room with swelling over the right side of the face associated with double vision. The swelling increased in a span of two days and was associated with dull headache. On examination he was conscious, oriented, following commands, moving all four limbs. He had double vision in right side and a restricted upward gaze with right side VII nerve palsy. Rest all neurological examinations were normal. Systemic examination was inconclusive as well. MRI paranasal sinus was suggestive of right frontal, maxillary and ethmoid sinusitis with right orbital cellulitis. There was minimal erosion in the posterior wall of the right maxillary sinus suggestive of Mucor mycosis. He was given amphotericin B injection in the post retro bulbar region and FESS (Functional endoscopic sinus surgery) was done with debridement. He was managed with IV amphotericin along with oral Posaconazole and insulin. His creatine levels were monitoredon a daily basis. He was discharged after completion of the injectable antifungals and was later switched to oral antifungals which was then later discontinued.

Case No.2

A 32-year-old, non-diabetic, young female was bought to the emergency with history of fever for 5 days and altered behavior since a night before the presentation, she recently recovered from COVID and was on steroids along with other conservative management. On examination she was restless, lethargic and was not following commands. Planters were flexor in the right and extensor in the left and she was not cooperative to other neurological examination. Her systemic examination was normal. Her urine showed 3+ ketone levels with protein in urine. Her GCS was E2V2M6. CT head showed hypodense ischemic changes in right frontal, temporal and parietal lobes suggestive of large MCA territory infarct with signs of sinusitis. A CT PNS was done which showed mucosal hypertrophy in maxillary sinuses with opacification of ethmoid sphenoid and soft tissue density seen in orbital apex and collection along the medial wall bilaterally. Her GCS was plummeting in view of which a right FTP decompressive craniotomy was done with lax duroplasty. A FESS with debridement was done as well along with IV amphotericin B. Repeat CT Head showed signs of hydrocephalous in view of which a Left Frontal EVD was done. Her nasal swab culture grew Rhizopus Arrhizus. She could not be saved despite our best efforts and died due to refractory septic shock.

Case No.3

A 57-yrs-old diabetic gentleman post-COVID with ARDS survivor presented in emergency with sudden onset blurring of vision since last 2 days and with 1 episode of sudden loss of consciousness following vigorous movement of all four limbs. He required 2 liters of O2 via nasal prongs since the infection. MRI Brain and PNS revealed sphenoid sinusitis with breech in the bony continuity and extension to temporal lobe with right frontal and a right cerebellar ring enhancing lesion suggestive of mucor mycosis along with SDH in right temporal region. On examination he was conscious, confused, pupils were 3mm bilaterally equally reacting to light with full extraocular movements. He was obeying commands and moving all four limbs. His plantar was mute, tone was normal, and power was 3/5 on the left side and 5/5 on right side. A FESS with Debridement and a right eye exenteration with fronto-temporal craniotomy and brain abscess excision was done and he was started on IV amphotericin B. A Chest CT showed signs of mucor mycosis with interstitial thickening and confluent opacities with bronchial prominence and multiple cystic areas and association of patchy areas of consolidation with cavitation in the bilateral upper lobes. Injectable amphotericin B was continued for a month with monitoring of kidney and liver functions. A repeat MRI Brain showed no intracranial extension of the lesions, and he was then discharged on oral

antifungals, anti-epileptics and antibiotics with other conservative management.

3. Discussion

COVID-19 is a rapidly communicating disease of respiratory tract with varying degree of symptoms ranging from mild to severe leading to death. It generally requires supportive care along with corticosteroids. On one hand steroids are used in modulating lung injury but on the other hand it leaves the person immunocompromised and susceptible to invasive infections. Furthermore, other comorbidities like diabetes complicate the condition and can have a dire consequence.

Mucor mycosis is an acute fungal infection caused by the members of mucoraceae family, a class of fungi that produces branching ribbon-like hyphae and reproduces by formation of zygospores (6). It is an opportunistic infection and a fatal fungal disease (1). The most common manifestation of mucor mycosis is rhino-orbito-cerebral form as seen in our cases mentioned above (2, 3). The fungi entry gateway is through inhalation via nose or paranasal sinuses. It can cause palatal ulcerations leading to necrosis and spread via direct wound contamination (6).

The symptoms of this condition vary and can present as facial swelling in the affected site, headache and fever (4). A prompt diagnosis is essential as the condition is very fatal. Diagnosis is done by clinical examination, radiological investigations, histopathology and culture of the specimen (3). Radiological images can show opacifications of sinuses while MRI may show destruction of bone (10, 11).

An immunocompromised state such as uncontrolled diabetes mellitus changes the normal immunological responses of the body. Hyperglycemia stimulates fungal proliferation and hampers phagocytic efficiency and decreases chemotaxis. Mycotic infection like Rhizopus produces enzymes such as Keto reductase which allows them to utilize patient's ketone bodies which is seen in patients with diabetic ketoacidosis (6, 7). The rhino cerebral form is the most common form of infection commonly seen in the patient with uncontrolled diabetes mellitus (8). The fungal hyphae can enter the bloodstream and can spread to the other organs which include cerebrum and lung which is further fatal (9).

Management is through IV amphotericin B while Posaconazole and isavuconazole (5). These medical management is in conjunction with total surgical debridement of the infected area (6). We used both amphotericin B and Posaconazole in case 1 and 3 while only injectable amphotericin B in case 2.

4. Conclusion

Post COVID 19 mucor mycosis is an invasive fungal infection with a high mortality rate. It mainly affects people with immunocompromised state mainly with uncontrolled diabetes mellites. Prompt recognition and action is necessary for the survival of the patient. Long term unsupervised steroid use appears to be the main reason for the mucor infection to sprout in post COVID survivors. While debridement with IV lipolyzed amphotericin B is the mainstay of the treatment, the medication and the surgery have repercussions of their own.

Consent - Taken

Yes, consent for study was taken from the respective patients.

No extra charges taken for the study

No

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