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# A Review of Chronic Fungal Manifestations of Post COVID-19 Infection

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**ABSTRACT:** COVID-19 is a highly communicable and viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which originated from Wuhan, China and spread around the world. In the current review, I analysed that After Covid 19 people have secondary complications, especially those with low immunity that are diabetic or organ transplant. I search literature using PubMed, Google Scholar, Scopus and Google search engines for original articles than analysed and review it. However, patients with nasal, ocular, respiratory travel due to viral infection are secondary complications like invasive mucor mycosis contempt lack of underlying well-defined immunocompromising disease. All most patients have Cough, fever, sputum production, ocular pain, blurred vision, dry eye, itching, Follicular conjunctivitis, usually intrapulmonary bleeding and haemoptysis are typical complications of invasive pulmonary mucor mycosis. The present epidemiologic study summarized more manifestations present after COVID 19 are rhino-orbito-cerebral, pulmonary, gastrointestinal and dermal caused by mucor mycosis.

**KEYWORDS:** Mucor mycosis, infection, COVID-19, immunity, pulmonary.

## I. INTRODUCTION

On Dec 31, 2019, a cluster of cases of pneumonia in people at Wuhan, China Hubei. The responsible pathogen is a novel coronavirus, named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), on Jan 24, 2020, first patient diagnosed as relevant in Europe, named coronavirus disease 2019 (COVID-19).

India and many Countries reported after covid 19 secondary infection found in patients like invasive Mucor mycosis. Mucor belong to order Mucorales, family Mucoraceae and the phylum mucormycota. family Mucoraceae Species are found in soil, organic materials, digestive systems, and plant surfaces.

The mortality of the disease is very high, regardless of an early diagnosis and aggressive treatment. these fungi aren't harmful to most people. However, for people who have weakened immune systems, breathing in mucoromycete spores can cause an infection in the lungs or sinuses which can spread to other parts of the body. (CDC)

I review occurrence of mucormycosis infection after COVID-19 in heart patient, diabetic patient and whose patient they have low immunity, also reported in patients undergoing solid organ transplants, haematological malignancy and corticosteroid therapy. This disease affects the sinuses and lungs of the individual who inhales fungal spores. The most common symptoms of 'Black Fungus' are redness and pain around eyes and/or nose, fever, headache, coughing, shortness of breath, vomiting blood and disillusion some patients diagnosis of pneumonia was based on computed tomographic (CT) scan reported by **Zhu N.** With the advent of Covid and aggressive steroid therapy there has been a rapid increase in the number of cases. The mortality rate of this rare disease is reported to be high. Mucor mycosis is not communicable but in immune-compromised hosts with high sugar levels these spores are able to germinate and spread. Rhino cerebral, Pulmonary, ophthalmic, Cutaneous, gastrointestinal mucormycosis developed after several day of recovery of COVID-19. Hot and humid climate oxygen humidifiers responsible for infection of black fungal.

## II. METHODS

A literature search was done using PubMed, Google Scholar, Scopus and Google search engines for original and review articles, using keywords mucor mycosis and after 19-COVID secondary infections, I studied published Article from 2019 to 2021. I included patients of all manifestation.

### Symptoms of mucormycosis-

Patients feel pain in the left or right side of the face, swelling of eyes, nasal blockage, nasal discharge, numbness in cheeks severe headache. The ferritin levels go up during a Covid-19 infection. Ferritin is known to contain iron which is a good food for mucormycosis.

**Cause** - At present, the Glucocorticoid and other steroids are being used for the treatment of covid 19 disease, which provides an opportunity for the Black Fungal appearance. Mucormycosis has been seen among those who have uncontrolled diabetes, whose immunity is compromised. Glucocorticoids are inexpensive, proven to be beneficial in COVID-19 but glucocorticoids can increase the risk of secondary infections according to Deepak Garg et al.

## III. DISCUSSION

My study shows that common clinical types of mucormycosis are rhino-orbito-cerebral, pulmonary, gastrointestinal and dermal.

**Pulmonary** - most studies show severely immunocompromised patients with haematological malignancy or neutropenia are suffer from mucor mycosis. Cough, fever, sputum production, haemoptysis, also reported by **Jung SuLee**, when mucormycosis has a high affinity for invading blood vessels. Usual intrapulmonary bleeding and haemoptysis are typical complications of invasive pulmonary mucor mycosis. All most patients have lymphopenia, median or high eosinophil and median neutrophil. Drugs like Corticosteroids i.e., Methylprednisolone and Dexamethasone are believed to modulate inflammation mediated lung injury and thereby reduce progression of respiratory failure. Lungs, is the second most common manifestation (58%) due to its aggressive clinical course according to **Daniela Pasero et al.** Researchers found that in radiological testing found in nodules masses, cavities, pleural effusion, interlobular septal thickening, a halo sign in pulmonary lobes. Patients had a lesion in one lobe, had lesions in multiple lobes in one lung, and had lesions in multiple lobes in both lungs.

### b. Eyelid, Ocular infections –

I studied that COVID-19 patients exhibit ocular manifestations including secretion, ocular pain, blurred vision, Conjunctival chemosis, dry eye, itching, Follicular conjunctivitis, foreign body sensation, photophobia, redness and tearing. eye rubbing, hand-eye contact, are main cause of infections.

Conjunctivitis is the most common ophthalmic manifestation documented in post COVID-19 patients. **S, Mehta et al.** noted bilateral lid oedema and bulky extraocular muscles on 10th day of Covid 19 in 60-year-old man. **Shweta M. Rob** observed ophthalmoplegia in middle age women. COVID-19 patients which showed that hand-eye contact was independently correlated to the presence of conjunctival congestion amongst patients. conjunctival hyperaemia, lid margin hyperemia and meibomian orifice abnormalities are common eyelid manifestations. Liwen Chen et al. (2020) found that most patients with COVID-19 had ocular abnormalities including, high temperature, shortness of breath, Dyspnoea, Nasal discharge, head ache.

Different organs might be involved, the most frequently affected of which are the lungs, being the second most common manifestation.

## IV. RESULT

I studied COVID-19 patients have moderate to severe immunocompromising disease and uncontrolled diabetes Due to which these mucormycosis become associates. The Mucor mycosis has mostly found to people who were travelling on COVID-19. My studies found increased risk for critically ill COVID-19 patients to develop co-infection with mucor mycosis, which is likely to increase mortality rates further. Therefore, testing for the presence of mucor in lower respiratory secretions in COVID-19 ICU patients should be considered.

My result highlights infections of invasive mucor mycosis and complications after COVID-19 for which to be alert and properly testing.

## V. CONCLUSIONS

My study evaluates coronavirus disease 19 (COVID-19) associated invasive mucor mycosis occur that those patients with diabetes and low immunity or have undergone an organ transplant. The present epidemiologic study summarized more manifestations present after COVID 19. Such as ophthalmic, pulmonary and rhinocerebral.



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