

Crisis:-Covid Treatment and Mucormycosis

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ABSTRACT:-

Mucormycosis is a fungal infection brimming a war in the shadow of covid-19 in India, Mucormycosis is caused by molds called as mucormycetes, corona virus disease caused by severe acute respiratory syndrome corona virus. (SARS-COV-2) has associated with wide range of bacterial and fungal infection. Aspergilliasis and Candida have been reported the main fungal pathogens for co-infection in the people of covid-19. Covid-19 increases/ leads to weakened immune system preventing the body form effectively protecting against infection as a result individuals recovering from covid-19 are the risk for Mucormycosis.

Steroid treatment for covid-19 may also act to suppress the body's immune response contributing to these increased Mucormycosis infection rate. Mucormycosis is highly tendency for contigenous spread associated with poor prognosis and other immunosuppressive condition including corticosteroid therapy and other drug therapy are known risk factor for Mucormycosis.

Keywords:- Mucormycosis, covid-19, corticosteroid therapy, drug therapy, immunosuppression, fungal infection.

I. INTRODUCTION:-

Mucormycosis

A serious but rare fungal infection caused by a group of molds called as mucormycetes, these molds lives throughout the environment. Mucormycosis mainly affects people who have health

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Problems or take medicines that lower the body ability to fight germs and sickness. The most commonly affects the sinuses or the lungs after inhaling fungal spore from the air it can also occurred on the skin after a cut, burns or other type of skin injury. The fungi that cause

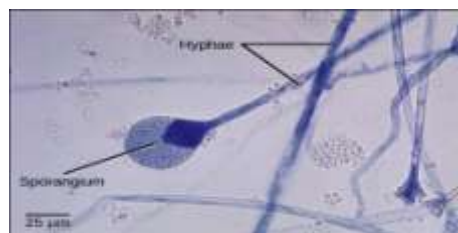


Fig:- Mucormycosis

Mucormycosis live in the environment. Mucormycetes, the group of fungi that cause Mucormycosis are present throughout the environment, particularly in soil and in association with decaying organic matter such as leaves, compost, piles and animal drug they more common in soil, than air and in summer and fall than in winter or spring. Most people in contact with microscopic fungal spore every day so it probably to completely avoid coming I contact with mucormycetes.

Covid-19

In dec.2019 corona virus species that spread from person to person was indentified in Wuhan china.The disease later on covid-19 posed and risks to be declared as a pandemic by world health organization in short time. A novel corona virus known as severe acute respiratory syndrome coronavirus-2 (SARS-COV-2) after that global researchers efforts into potential treatment started in jan-200 and there are now thousand of studies looking at how to treat and manage disease while there are no antiviral licensees for use for this infections. Including SARS & MERS (MiddleEast Respiratory Syndrome) as well as in-vitro studies, demonstrate that they are potential benefits that could be obtained from antiviral therapy.



Fig: - Corona virus

Drug therapy used in covid-19: -

In general the use of drug against viral diseases and against SARS-COV-2 and their mechanism action are below.

- **Ivermectin:** - Ivermectin cause an increases in permeability of chloride ions by hyperpolarisation of the nerve or muscle cell, the result in deactivation of the channel by manipulating chloride level, in studies it was found that it is highly effective against SARS-COV-2 and to stop the virus in the replication stage.

- **Remdesivir**-is a new antiviral drug of the class of nucleotide analogs. Which can be mechanically metabolized to the ATP analogue that inhibit the RNA polymerase enzyme of the virus, effective mechanism of Remdesivir drug as a nucleoside analogue, it is in the form of metabolite competing with adenosine triphosphate(ATP) to join the newly produced RNA strip offer the Remdesivir is metabolized and converted into NTP, it will stop the RNA synthesis.
- **Corticosteroids therapy:** - According to WHO the panel made two recommendations, a strong recommendation for systemic (i.e. intravenous or oral) corticosteroid therapy. (e.g. 6mg dexamethasone orally or intravenously daily or 50mg of hydrocortisone intravenously every 8 hours)for 7 to 10 days on patient with severe and critical covid-19 and a conditional recommendation not to use corticosteroid therapy in patient with non-severe covid-19.

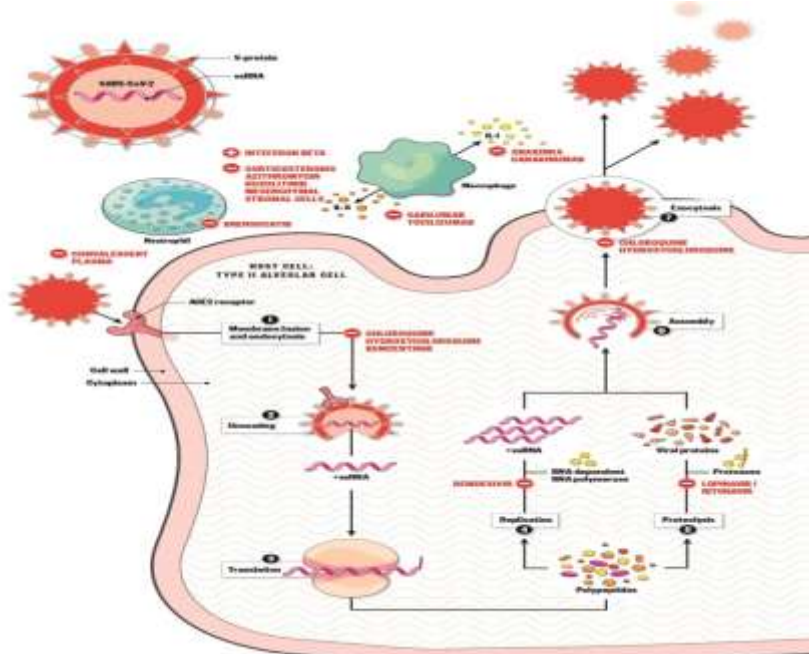


Fig: - mechanism of action of several medicines that are being put through clinical trial for covid-19.

How Mucormycosis rise in the covid-19 patient:

The primary reason that appears to be facilitating mucorales spores to germinate in people with covid-19 is an ideal environment of low O₂ (hypoxia), high glucose, acidic medium 9metabolic acidosis, diabetic, steroid, induced hyperglycemia, decreased phagocytic activity of WBC's due to

immunosuppression (SARS-COV-2) mediated, steroid mediated coupled with several other risk factor like prolonged hospitalization with ventilator. a cumulative prednisone dose of greater than 600mg or a total methyl prednisone dose of 12-7gm given during the month before prednisone Immunocompromised people to mucormycosis. In the recent systemic review conducted until April9,

2021 by tohn.et.al that reported finding of 41 confirmed mucormycosis cases in people with covid-19, DM was in 93% of cases, 88% were receiving corticosteroid, 101 mucormycosis cases (as confirmed and 6 suspected) in covid-19, more than two third (76.3%) received causes of corticosteroid. covid-19 often causes, endothelial damage thrombosis, lymphopenia and reduction in CD₄ and CD₈ and level and thus predisposes to secondary or opportunistic fungal infection. The mean duration between the diagnosis of covid-19 and development of symptoms of mucormycosis was 156±9.6 days.

Deferoxamine: - a medication of Deferoxamine infection acquire iron from the affected individuals, Deferoxamine leads to growth and spread of infection and use of this drug is another risk factor for mucormycosis.

Toclizumab: - according to European organization for research and treatment of cancer and the mycoses study group of education and research consortium CEORTC/MSGEROA consensus, prolonged use of corticosteroid at therapeutic dose of 0.3mg/kg of least 3weeks in past 60days in considered risk factor for invasive fungal disease, further more IL-6 inhibiting drug such Tocilizumab may cause immune degranulation and increases risk of secondary infection without providing substantial clinical benefits in the patient with covid-19.

Mucormycosis in covid-19 summary of 82 Case report India up to may2021: -

LFU: - Lost to follow-up, LAMA: - Left against medical advice.

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Risk factor: -

1. Organ Transplantation
2. Diabetes Ketoacidosis
3. Neutropenia
4. Protein calorie
5. Malnutrition
6. Iron overload

Treatment: -

The new generation antifungal therapeutics including Amphotericin-B, Ketoconazole, Itraconazole and Variconazole, Amphotericin-B, Ketoconazole and Itraconazole was similar MIC, Variconazole has higher MIC, and there are several formulations of Amphotericin-B available like, Liposome's, Lipid base Amphotericin, colloidal dispersion of

Amphotericin-B for most common infection to human. The combination of antifungal medication along broad spectrum antibiotics like trovafloxacin or ciprofloxacin effectively suppresses pulmonary zygomycosis in marine model.

II. CONCLUSION:

A major use of Tocilizumab, Deferoxamine, Remdesivir, Dexamethasone (Corticosteroid) in a background of covid-19 appears to increase mucormycosis.

All efforts should be made to maintain optimal glucose and only judicious use of Tocilizumab, Remdesivir, Dexamethasone, Deferoxamine, Corticosteroids in patient with covid-19.

III. RESULT:

Characteristics of 82 patients of mucormycosis cases with covid-19 studied in which 82 patient are caused with mucormycosis in which 58/82 person taking steroid and 8/82 person taking Tocilizumab and 10/82 taking Remdesivir. And few cases were received all 3 drugs for covid-19 and 77/82 was Confirmed test for mucormycosis and 5 was Suspected all these patient are treating with covid-19 drug and some of diabetic patient.

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