



Ministry of Health and Family Welfare

Stay Safe from Mucormycosis - a Fungal Complication being Detected in COVID-19 Patients

Control Diabetes, Use Steroids Judiciously, Keep Good Hygiene, Don't Self-Medicate

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Even as we try our best to protect ourselves from and cope with COVID-19, there is another threat being posed by a fungus, which we must know and act upon. Mucormycosis, a fungal infection, is being reported in a few COVID-19 patients during or post recovery. As per a statement given by the Health Minister of Maharashtra two days ago, more than 2000 people had already been affected by this fungal infection in the state; 10 people had even succumbed to it. Some patients even lost their eyesight.

What causes Mucormycosis?

Mucormycosis or black fungus is a complication caused by fungal infection. People catch mucormycosis by coming in contact with the fungal spores in the environment. It can also develop on the skin after the fungus enters the skin through a cut, scrape, burn, or other type of skin trauma.

The disease is being detected among patients who are recovering or have recovered from COVID-19. Moreover, anyone who is diabetic and whose immune system is not functioning well needs to be on the guard against this.

According to an advisory issued by the Indian Council of Medical Research, the following conditions in COVID-19 patients increase the risk of mucormycosis infection:

1. Uncontrolled diabetes
2. Weakening of immune system due to use of steroids
3. Prolonged ICU/hospital stay
4. Co-morbidities / post organ transplant / cancer
5. Voriconazole therapy (used to treat serious fungal infections)



The disease is caused by a set of micro-organisms known as *mucormycetes*, which are present naturally in the environment, seen mostly in soil and in decaying organic matter like leaves, compost and piles.

In normal course, our body's immune system successfully fights such fungal infections. However, we know that COVID-19 affects our immune system. Moreover, the treatment of COVID-19 patients involves intake of drugs like dexamethasone, which suppress our immune system response. Due to these factors, COVID-19 patients face a renewed risk of failing the battle against attacks mounted by organisms such as *mucormycetes*.

In addition, COVID patients undergoing oxygen therapy in ICU, where humidifier is used, are prone to fungal infection because of exposure to moisture.

But this does not mean that every COVID patient will get infected by Mucormycosis. The disease is uncommon in those not having diabetes but can be fatal if not treated promptly. Chances of recovery depend upon early diagnosis and treatment.

What are the common symptoms?


Mucormycosis begins to manifest as skin infection in the air pockets located behind our forehead, nose, cheekbones, and in between the eyes and teeth. It then spreads to eyes, lungs and can even spread to the brain. It leads to blackening or discoloration over the nose, blurred or double vision, chest pain, breathing difficulties and coughing of blood.

The Indian Council of Medical Research has advised that not all cases of blocked nose should be considered as cases of bacterial sinusitis, particularly during/after the treatment of Covid-19 patients. One must seek medical help for detecting fungal infection.



Mucormycosis - if uncarred may turn fatal

Mucormycosis is a fungal infection that mainly affects people who are on medication for other health problems that reduces their ability to fight environmental pathogens.



Sinuses or lungs of such individuals get affected after fungal spores are inhaled from the air.

This can lead to serious disease with warning sign and symptoms as follows:

- Pain and redness around eyes and/or nose
- Fever
- Headache
- Coughing
- Shortness of breath
- Bloody vomits
- Altered mental status

What predisposes

- Uncontrolled diabetes mellitus
- Immunosuppression by steroids
- Prolonged ICU stay
- Co-morbidities – post transplant/malignancy
- Voriconazole therapy

Don'ts

- Do not miss warning signs and symptoms
- Do not consider all the cases with blocked nose as cases of bacterial sinusitis, particularly in the context of immunosuppression and/or COVID-19 patients on immunomodulators
- Do not hesitate to seek aggressive investigations, as appropriate (KOH staining & microscopy, culture, MALDI-TOF), for detecting fungal etiology
- Do not lose crucial time to initiate treatment for mucormycosis

How to prevent

- Use masks if you are visiting dusty construction sites
- Wear shoes, long trousers, long sleeve shirts and gloves while handling soil (gardening), moss or manure
- Maintain personal hygiene including thorough scrub bath

How to manage

- Control diabetes and diabetic ketoacidosis
- Reduce steroids (if patient is still on) with aim to discontinue rapidly
- Discontinue immunomodulating drugs
- No antifungal prophylaxis needed
- Extensive Surgical Debridement - to remove all necrotic materials
- Medical treatment
 - Install peripheral inserted central catheter (PICC line)
 - Maintain adequate systemic hydration
 - Infuse Normal saline IV before Amphotericin B infusion
 - Antifungal Therapy, for at least 4-6 weeks (see the guidelines below)
- Monitor patients clinically and with radio-imaging for response and to detect disease progression

Team Approach Works Best

- Microbiologist
- Internal Medicine Specialist
- Intensivist
- Neurologist
- ENT Specialist
- Ophthalmologist
- Dentist
- Surgeon (maxillofacial/plastic)
- Biochemist

Detailed management guideline & information available on the following

https://www.jmyc.org.in/index.php/MJMedPages/153331_2965147_110051.pdf

https://www.jmyc.org.in/index.php/JMEdPages/192195_307936_110303.pdf

When to Suspect

(in COVID-19 patients, diabetics or immunosuppressed individuals)

- Sinusitis – nasal blockade or congestion, nasal discharge (blackish/bloody), local pain on the cheek bone
- One sided facial pain, numbness or swelling
- Blackish discoloration over bridge of nose/palate
- Toothache, loosening of teeth, jaw involvement
- Blurred or double vision with pain; fever, skin lesion; thrombosis & necrosis (eschar)
- Chest pain, pleural effusion, haemoptysis, worsening of respiratory symptoms

Advisory developed by the following experts & National Task Force for COVID-19

<ul style="list-style-type: none"> Dr Anurag Chhabra, Professor & Head, Department of Medical Microbiology, PGIMER, Chandigarh Dr Ash Pitt, Infectious Disease Specialist, Ahmedabad Dr Rajeev Kumar, Consultant Infectious Disease Physician, Pune Dr Prabhat Shrivastava, Vice Chairman, ICMR, New Delhi Dr J P Mehta, Medical Superintendent, Dr K J Somaiya Hospital, Dept. of Internal Medicine and Multi-disciplinary Clinical Management Group, ICMR Medical College, Civil Hospital, Ahmedabad Dr Girish Parmar, Dean, Government Dental College & Hospital, Ahmedabad Dr Suresh Acharya, Professor, Dept. of Internal Medicine, Seth NRI, Municipal Medical College, Ahmedabad Dr Hemang Parashar, Medical Microbiologist, IISL, NRI, Municipal Medical College, Ahmedabad Dr R B S Trivedi, Medical Superintendent, Dr Dinkraj Upadhyay Medical College, Rajkot 	<ul style="list-style-type: none"> Dr Parikash Bach, Professor, Dept. of Pediatrics, PN, Dnyanesh, Udaipur Dr Medha Choudhary, Assistant Professor, Dept. of ENT, PN, Dnyanesh, Udaipur Dr Deep Mehta, Associate Professor, Dept. of ENT, PN, Dnyanesh, Udaipur Dr Anand Bhargava, Assistant Professor, Dept. of Internal Medicine, PN, Dnyanesh, Udaipur Dr Sanjay Patel, Head, Epidemiology & Communicable Diseases (ECDC), ICMR, New Delhi Dr Aparna Mahapatra, Scientist E, Central Food & Health Systems Research Unit, ECDC, ICMR, New Delhi Dr Madhusudhan Reddy, Scientist D, ECDC, ICMR, New Delhi Dr Tanya Arora, Scientist D, Clinical Trial & Health Systems Research Unit, ECDC, ICMR, New Delhi Dr Ganesh Kumar, Scientist C, Clinical Trial & Health Systems Research Unit, ECDC, ICMR, New Delhi
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While the infection may just begin with a skin infection, it can spread to other parts of the body. Treatment involves surgically removing all dead and infected tissue. In some patients, this may result in loss of upper jaw or sometimes even the eye. Cure may also involve a 4-6 weeks course of intravenous anti-fungal therapy. Since it affects various parts of the body, treatment requires a team of microbiologists, internal medicine specialists, intensivists, neurologists, ENT specialists, ophthalmologists, dentists, surgeons and others.

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Self-medication and over-dosage of steroids can result in fatal events and hence doctor's prescription should be strictly followed. Speaking about the adverse effects of inappropriate use of steroids, Member (Health), NITI Aayog, Dr. V.K. Paul says: "Steroids should never be administered at an early stage of COVID-19. It should be taken only after sixth day of

infection. Patients should stick to appropriate doses of the drugs and take the drug for specific number of days as advised by the doctors. Rational use of medicines should be ensured to avoid adverse side effects of the drug.”

“Other than steroids, use of COVID-19 drugs such as Tocilizumab, Itolizumab also suppresses the immune system. And when these drugs are not used appropriately, it increases the risk, as our immune system fails to fight the fungal infection.” Dr. Paul adds.

ICMR in its guidelines has also advised COVID-19 patients to discontinue immunomodulating drugs, a substance that stimulates or suppresses immune system. The National COVID-19 Task Force has revised the dosage of Tocilizumab to prevent any such adverse effects. Maintaining proper hygiene can also help keep the fungal infection away.

For patients on oxygen therapy, it should be ensured that the water in the humidifier is clean and is refilled regularly. Attention should be paid to ensure there is no leakage of water (to avoid wet surfaces where the fungus can breed). Patients should maintain proper hygiene by keeping their hands as well as body clean.

Be on guard after COVID Recovery as well





Dr. V.K. Paul, NITI Aayog, on guidelines to minimise risk of ...



After recovering from COVID-19, one should closely monitor and should not miss any warning signs and symptoms mentioned above, as the fungal infection is found to emerge even weeks or months after recovery. One should make judicious use of steroids as per doctor's advice to avoid risk of infection. Early detection of the disease can ease the treatment of the fungal infection.

DJM/CP/DL/PIB Mumbai



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pibmumbai@gmail.com

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