

Yellow Fungus emerging cases in India during the second wave of COVID-19

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Abstract

The authors intended to give a swift orientation on the new danger even after the COVID-19 health battle, i.e., the Yellow fungus, also called *Mucor septicus* infection. After recuperating from COVID-19, patients with diabetes mellitus underwent steroidal treatment due to unhygienic conditions that led to yellow fungus infection. This presentation enlightens quick data about *Mucor septicus* infection, its origin in India, risk factors, symptoms, treatment and prevention of the yellow fungus. Lethargy, poor appetite, weight loss, meagre metabolism, and recessed eyes are the major symptoms of *Mucor septicus* infection. The review summarizes that by maintaining hygienic conditions, health checkups, and doctors' advice, one can fight and eradicate the yellow fungus.

Keywords: yellow fungus; infection; symptoms; prevention; control; treatment

Introduction

There's been an unparalleled upsurge in black fungus cases and, most recently, white fungus cases, both instigated by the binge of conservational molds and unsanitary circumstances (Sahoo, Mishra, Pradhan, & Samal, 2021; Zhu et al., 2020). To date, there have been over 8000 cases described in India (Deshmukh, Upadhyay, Patwadkar, & Patil, 2020). However, as is being perceived right now, there's now a new loitering danger, much creepier than the black, white, and yellow fungus contagion (Nori et al., 2021).

The black fungus that produces the terminal contagion, namely *Mucormycosis* (Elfiky, Azzam, & Shafaa, 2021), originated in a patient in Uttar Pradesh's Ghaziabad (Reddy, Rakesh, Chauhan, & Sharma, 2015). The yellow fungi produce superficial and deep mycoses that disturb pets and imprisoned and wild animals (specifically reptiles) (Praveenya, Singh, Sathish Kumar, & Kalyan, 2012).

Little is recognized in the public province about the recently described Yellow Fungus illness. The public health establishments of India do not carry any particulars about the pathology and menace of this disease, an alternative zoonotic illness that can occasionally hurdle immunocompromised patients. Experts advise that yellow fungus contagion, unlike the two other contagions, could be much creepier, as it affects the body's interior organs. In contrast to the two other contagions, the yellow fungus twitches off within, causes pus escape, unhurried curative of wounds and, in thoughtful cases, can also cause overwhelming indications such as organ letdown and acute necrosis (Chinthaginjala, Ahad, Sumanth, Shaik, & Dasari, 2020; King, Roth-Johnson, Dodd, & Newsom, 2014). Its remnants are so life-threatening that patients seek help for their contagion as soon as they perceive symptoms.

Ghaziabad Case Study

The primary instance of yellow fungus contagion has been noticed in Ghaziabad, Uttar Pradesh. There was not much accessible regarding the case. Doctors have cautioned



that yellow fungus can be more treacherous than black and white fungus. After black fungus and white fungus, a yellow fungus case was enlightening as the patient was cured in Ghaziabad by an ENT surgeon. The patient's CT scan exhibited no irregularity, but endoscopy disclosed 3 kinds of fungus developing in his body. He has yellow, black and white funguses. This fungus originated in reptiles for the first time. An Amphotericin B injection is the first choice to treat this illness. It takes a long time to heal. This patient's illness cannot be said to be good. He is still enduring treatment (Dasa & Patraa, 2021).

Earlier reported cases of Yellow Fungus

Cases of Yellow Fungus in humans have been testified in some countries other than India. A human-specific yellow fungus was earlier recovered from breakwater abrasions, inguinal bumps, and leg sores of an HIV-positive patient and an inguinal bulge of an immunocompetent patient in the US.

A Nigerian HIV-positive patient in Germany established lung diffusion and a brain sore from the Yellow fungus contagion (Dassi, JhaJhria, Aggarwal, & Jha, 2021). Many of these rare human cases happened as unscrupulous infections in immunocompromised patients. Regarding infection, supervision of pets is no better for an immunosuppressive individual than being in communication with other individuals or the environment. Conversely, in these cases, a special provision should be made since exotic or wild animals may harbor rare pathogens that may turn unscrupulous and turn the immunosuppressive human body into its host (Lin, Chiu, Lin, Chung, & Chou, 2021).

What is Yellow Fungus?

In a paper printed in the US National Library of Medicine, unshaven dragons kept in prison suffer from an occasionally lethal dermatological situation recognized in the pet trade as yellow fungus disease. The statuses under which mycotic diseases in these species transpire are not yet recognized, although insufficient diet and husbandry, environmental stress, trauma, and existing dermatitis are all likely providers (Limon et al., 2021; Paré et al., 2020).

The Symptoms of Yellow Fungus

Both black and white fungi contagions can cause disturbing symptoms, which can even lead to facial irregularity and penetrating swelling. What makes the yellow fungus even ghastlier is that it twitches to feast on the body inside and causes very unlike symptoms at first.

Some of the normally identified symptoms of the contagion right now are (Jaber & Salem, 2014; Kumar et al.).

Lethargy

The fungal infection twitches to feast internally and ponders heavily on vital organs, leaving you without energy. This can result in symptoms like acute weariness, fatigue, and tiredness.

Poor appetite/no appetite

The feast of the fungal contagion can also distract the digestion.

Patients may have symptoms like loss of appetite, poor consumption habits all of a sudden.

Weight loss, poor metabolism

Metabolic variations could also be a sign to look out right now. Specialists say that uncommon weight forfeiture is also a mark that a person supplies medical exploration, mainly if the patient also vitrines symptoms parallel to other fungal taints in the transmission right now.

Sunken eyes

The facial irregularity is a distinctive symptom of black fungus. Professionals say that thoughtful cases of yellow fungus might also result in patient anguish from red, sunken eyes, slow healing of wounds and eventual necrosis. As cited above, sometimes, serious escape of pus can also be perceived.

Treatment

Yellow or other fungal infections being communicated right now aren't precisely new or rare. Presently, Amphotericin B injection, which is an antifungal medication, is the only known management therapy for struggling with the contagion (Shi, Kocaefe, Amburgey, & Zhang, 2007).

Causes of Yellow Fungus

The major reasons for developing yellow fungus in humans are expressed here (Andre, Parker, & Briggs, 2008; Bowman et al., 2007).

- Co-morbidities
- Filthy environment
- Lack of hygiene
- Prolonged use of steroids
- Slighter immunity
- The presence of dampness in the rooms/house
- Unhygienic habits
- Unrestrained diabetes

Precautions

Here are some of the safety measures that one can take to shield themselves from the yellow fungus (Mishra, Behera, Sharma, & Samal, 2021).

- Keep the home and surroundings clean.
- Eliminate fusty food and fecal stuff proximately to check bacterial and fungal growth.
- Retain the humidity of the room/home to check as extreme humidity endorses bacteria growth. Just like for COVID patients, preserving clean airflow in the room and home is essential.
- COVID-19 positive patients must proximately start management so difficulties like yellow fungus do not develop.

Conclusion

The authors summarized the bounce of the new peril afterward COVID-19 health combat, i.e., Yellow fungus (*Mucor septicus*)



contagion. After improving from COVID-19, patients with diabetes mellitus experienced steroidal dealing and owed to unsanitary circumstances that led to yellow fungus contagion. Any symptoms of lethargy, signs of hunger, loss of weight, poor metabolism, and recessed eyes should not be neglected, as these may be symptoms of yellow fungus. Maintaining hygienic circumstances, health examinations, and doctors' counsel, one can contest and eliminate yellow fungus.

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Nil

Conflict of Interest

The authors declare that they have no conflict of interest.

References

1. Andre, S. E., Parker, J., & Briggs, C. J. (2008). Effect of temperature on host response to *Batrachochytrium dendrobatidis* infection in the mountain yellow-legged frog (*Rana muscosa*). *Journal of Wildlife Diseases*, 44(3), 716-720.
2. Bowman, M. R., Paré, J. A., Sigler, L., Naeser, J. P., Sladky, K. K., Hanley, C. S., . . . Porter, R. (2007). Deep fungal dermatitis in three inland bearded dragons (*Pogona vitticeps*) caused by the *Chrysosporium* anamorph of *Nannizziopsis vriesii*. *Medical mycology*, 45(4), 371-376.
3. Chinthaginjala, H., Ahad, H. A., Sumanth, G., Shaik, M., & Dasari, R. R. (2020). Hunting Hantavirus: A Quick Guide for Healthcare Professionals before It Invades the Globe unlike COVID-19. *International Journal of Pharmaceutical and Phytopharmacological Research*, 1-6.
4. Dasa, S., & Patra, C. R. (2021). aDepartment of Applied Biology, CSIR-Indian Institute of Chemical Technology, Tarnaka, Hyderabad, India bAcademy of Scientific and Innovative Research (AcSIR), Ghaziabad, Uttar Pradesh, India □ Corresponding author. *Handbook of Greener Synthesis of Nanomaterials and Compounds: Volume 2: Synthesis at the Macroscale and Nanoscale*, 139.
5. Dassi, M., JhaJhria, A., Aggarwal, N., & Jha, L. (2021). MO697 tuberculous peritonitis with hemophagocytic lymphohistiocytosis in a patient on continuous ambulatory peritoneal dialysis: a case report. *Nephrology Dialysis Transplantation*, 36(Supplement_1), gfab101. 0019.
6. Deshmukh, R., Upadhyay, K., Patwadkar, R., & Patil, S. (2020). Mucor Mycosis in COVID-19. *Journal of Advanced Research in Medicine (E-ISSN: 2349-7181 & P-ISSN: 2394-7047)*, 7(3), 20-23.
7. Elfiky, A. A., Azzam, E. B., & Shafaa, M. W. (2021). The anti-HCV, Sofosbuvir, versus the anti-EBOV Remdesivir against SARS-CoV-2 RNA dependent RNA polymerase in silico. *Molecular Diversity*, 1-11.
8. Jaber, L. R., & Salem, N. M. (2014). Endophytic colonisation of squash by the fungal entomopathogen *Beauveria bassiana* (Ascomycota: Hypocreales) for managing Zucchini yellow mosaic virus in cucurbits. *Biocontrol science and technology*, 24(10), 1096-1109.
9. King, J. M., Roth-Johnson, L., Dodd, D. C., & Newsom, M. E. (2014). *The Necropsy Book: A guide for veterinary students, residents, clinicians, pathologists, and biological researchers*: The Internet-First University Press.
10. Kumar, Y. B., Ahad, H. A., Haranath, C., Sumanth, G., Pasupuleti, D. S., & Reddy, S. S. Platelet Rich Plasma Therapy: A quick note for every health care professional.(2020). *Int. J. Life Sci. Pharma Res*, 10(5), P84-89.
11. Limon, T., Birke, A., Monribot-Villanueva, J. L., Guerrero-Analco, J. A., Altúzar-Molina, A., Carrión, G., . . . Aluja, M. (2021). Chitosan coatings reduce fruit fly (*Anastrepha obliqua*) infestation and development of the fungus *Colletotrichum gloeosporioides* in Manila mangoes. *Journal of the Science of Food and Agriculture*, 101(7), 2756-2766.
12. Lin, W.-J., Chiu, M.-C., Lin, C.-C., Chung, Y.-K., & Chou, J.-Y. (2021). Efficacy of Entomopathogenic fungus *Aspergillus nomius* against *Dolichoderus thoracicus*. *BioControl*, 1-11.
13. Mishra, A., Behera, L., Sharma, S. S., & Samal, K. C. (2021). The Rising Havoc of the Black, White and Yellow Fungi in India. *Biotica Research Today*, 3(5), 418-420.
14. Nori, P., Cowman, K., Chen, V., Bartash, R., Szymczak, W., Madaline, T., . . . Weston, G. (2021). Bacterial and fungal coinfections in COVID-19 patients hospitalized during the New York City pandemic surge. *Infection Control & Hospital Epidemiology*, 42(1), 84-88.
15. Paré, J. A., Wellehan, J., Perry, S. M., Scheelings, T. F., Keller, K., & Boyer, T. (2020). Onygenalean Dermatofungaloses (formerly yellow fungus disease, snake fungal disease) in reptiles. *Journal of Herpetological Medicine and Surgery*, 30(4), 198-209.
16. Praveenya, P., Singh, B., Sathish Kumar, D., & Kalyan, P. (2012). Antibiotic resistance creating new epoch. *J Bacteriol Parasitol*, 3(131), 2.
17. Reddy, S. S., Rakesh, N., Chauhan, P., & Sharma, S. (2015). Rhinocerebral mucormycosis among diabetic patients: an emerging trend. *Mycopathologia*, 180(5), 389-396.
18. Sahoo, J. P., Mishra, A. P., Pradhan, P., & Samal, K. C. (2021). Misfortune Never Comes Alone-The New “Black Fungus” Accompanying COVID-19 Wave. *Biotica Research Today*, 3(5), 318-320.
19. Shi, J. L., Kocaefe, D., Amburgey, T., & Zhang, J. (2007). A comparative study on brown-rot fungus decay and subterranean termite resistance of thermally-modified and ACQ-C-treated wood. *Holz als Roh-und Werkstoff*, 65(5), 353-358.
20. Zhu, W., He, Q., Gao, H., Nitayavardhana, S., Khanal, S. K., & Xie, L. (2020). Bioconversion of yellow wine wastes into microbial protein via mixed yeast-fungus cultures. *Bioresource technology*, 299, 122565.