

LETTER TO THE EDITOR

Open Access

# COVID 19 infection and mucormycosis—a dangerously increasing combination



Satvinder Singh Bakshi<sup>1\*</sup>  and Vinoth Kumar Kalidoss<sup>2</sup>

**Keywords:** COVID 19, Mucormycosis, Glucocorticoids

To the editor,

## Background

With the current pandemic of coronavirus disease 2019 (COVID-19) raging, there has been a frantic search for treatment options. Out of the several treatment options that have been tried with varying degrees of success, systemic glucocorticoids have been shown to improve survival in COVID-19. Unfortunately, the widespread use of glucocorticoids has also led to an increase in the side effects of these drugs especially an increase in secondary bacterial or fungal infections. COVID-19-associated pulmonary aspergillosis (CAPA) complicating the course of COVID-19 has widely been reported; there are only a few reports on mucormycosis [1, 2], probably due to the lack of clinical suspicion and difficulty in isolation of causative fungi.

## Main text

Mucormycosis is an acute or subacute rapidly progressing infections caused by the angioinvasive fungi in the order of Mucorales [3]. It most commonly affects patients with poorly controlled diabetes mellitus and immunocompromised patients, leading to significant morbidity and mortality. The most common region affected is the nose, paranasal sinus, and brain leading to rhino-orbital and rhino-cerebral mucormycosis; this is also seen in the present pandemic and most of the case reports are of rhino-orbito-cerebral mucormycosis [4]; however, there are reports of pulmonary [1] and gastrointestinal mucormycosis too [5]. The cause

for increased mucor infection in patients is complex and includes an interplay of factors, like pre-existing diseases, such as diabetes mellitus; use of immunosuppressive therapy like glucocorticoids and tocilizumab; pre-existing lung conditions; and systemic immune alterations by the virus itself like reduced number of T lymphocytes, CD4+T, and CD8+T cells [4].

Many challenges have also emerged in the management of mucormycosis during this pandemic. Early detection, control of hyperglycemia, liposomal amphotericin B, and surgical debridement are the cornerstones in the successful management of mucormycosis. However, in the current scenario, it is difficult to control the hyperglycemia due to the extensive use of steroids, most operation theaters remain shut due to diversion of manpower and other resources to other departments; therefore, delaying surgical debridement and the presence of coexisting multi-organ dysfunction in these patients makes it difficult to shift them for imaging studies.

## Conclusion

In this scenario, it is imperative that clinicians should be sensitized to the increased risk of development of this fatal infection, especially while treating diabetic coronavirus-affected patients with systemic steroids. In addition, judicious use of glucocorticoids must be advocated in all patients.

## Abbreviations

COVID-19: Corona virus 2019; CAPA: COVID-19-associated pulmonary aspergillosis

## Acknowledgements

None

\* Correspondence: [saty.bakshi@gmail.com](mailto:saty.bakshi@gmail.com)

<sup>1</sup>Department of ENT and Head & Neck Surgery, AIIMS Mangalagiri, Guntur, Andhra Pradesh 522503, India  
Full list of author information is available at the end of the article

**Authors' contributions**

SSB and VKK contributed to the manuscript concept, design, acquisition of the data, and writing and revising of the original draft. All authors have read and approved the final manuscript.

**Funding**

No funding was obtained.

**Availability of data and materials**

Not applicable

**Declarations****Ethics approval and consent to participate**

Not applicable

**Consent for publication**

Not applicable

**Competing interests**

The authors declare that they have no competing interests.

**Author details**

<sup>1</sup>Department of ENT and Head & Neck Surgery, AllMS Mangalagiri, Guntur, Andhra Pradesh 522503, India. <sup>2</sup>Department of Community and Family Medicine, AllMS Mangalagiri, Guntur, Andhra Pradesh 522503, India.

Received: 2 May 2021 Accepted: 19 May 2021

Published online: 27 May 2021

**References**

1. Garg D, Muthu V, Sehgal IS, Ramachandran R, Kaur H, Bhalla A et al (2021) Coronavirus disease (Covid-19) associated mucormycosis (CAM): case report and systematic review of literature. *Mycopathologia*. 5:1–10. <https://doi.org/10.1007/s11046-021-00528-2>
2. Veisi A, Bagheri A, Eshaghi M, Rikhtehgar MH, Rezaei Kanavi M, Farjad R (2021) Rhino-orbital mucormycosis during steroid therapy in COVID-19 patients: a case report. *Eur J Ophthalmol* 10:11206721211009450
3. Bakshi SS (2019) Rhino-orbital mucormycosis. *Bull Emerg Trauma* 7(1):88–89. <https://doi.org/10.29252/beat-0701015>
4. John TM, Jacob CN, Kontoyiannis DP (2021) When uncontrolled diabetes mellitus and severe COVID-19 converge: the perfect storm for mucormycosis. *J Fungi Basel Switz* 7(4):298
5. do Monte Junior ES, Santos MELD, Ribeiro IB, Luz G d O, Baba ER, Hirsch BS et al (2020) Rare and fatal gastrointestinal mucormycosis (zygomycosis) in a COVID-19 patient: a case report. *Clin Endosc* 53(6):746–749

**Publisher's Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

---

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)

---