

## A toddler infected with mucormycosis - reporting the youngest case of mucormycosis in post COVID phase

Dear Editor,

Mucormycosis is a rare disease but has gained more attention than before because of coronavirus disease 2019 (COVID-19) pandemic. Mucormycosis is fungal infection caused by fungi Mucoraceae.<sup>[1]</sup> It mostly affects immunocompromised adults and children and causes mortality of about 50%. We are reporting the management of rhino-orbital mucormycosis in a 3-year-old girl, which till date must be the youngest reported case of this fatal disease in India.

A 3-year-old girl presented for surgical debridement of rhino-orbital mucormycosis. She was diagnosed with type 1 diabetes mellitus (DM) two years back, for which she had been on insulin. A month back, she developed high-grade fever for which she was

hospitalised and tested for COVID-19. She tested negative on reverse transcription-polymerase chain reaction (RT-PCR), was given antipyretics and sent home. After 15–20 days, she developed severe pain over left cheek and eye followed by swelling and redness involving both upper and lower eyelids. She was brought to our hospital. As per hospital protocols, COVID-19 using RT-PCR test came negative. The magnetic resonance imaging (MRI) of brain and paranasal sinus showed left anterior ethmoidal and maxillary sinusitis, multiple loculated T1 isointense, T2 hyperintense with central hypointense areas in subcutaneous tissue of left ala of nose, premaxillary and pre-antral region on left side with inflammatory changes, focal defect in left lamina papyracea and inferior wall of left orbit with left orbital cellulitis. There was no history of hospital admission, steroid intake or oxygen use.

She presented with dehydration and pulse rate of 110/min, blood pressure of 98/60 mm Hg and room air oxygen saturation of 96%. Her blood sugar was 435 mg/dl despite insulin therapy. She was started on amphotericin B. Her urine tested positive for ketones. Her haemoglobin was 8.8g/dL, total leukocyte

count was 15,000/cumm, and platelet counts were 2.2 lakhs/cumm. Rest of her blood investigations including renal and liver function tests were within normal limits. She was planned for surgery under general anaesthesia with oral endotracheal intubation.

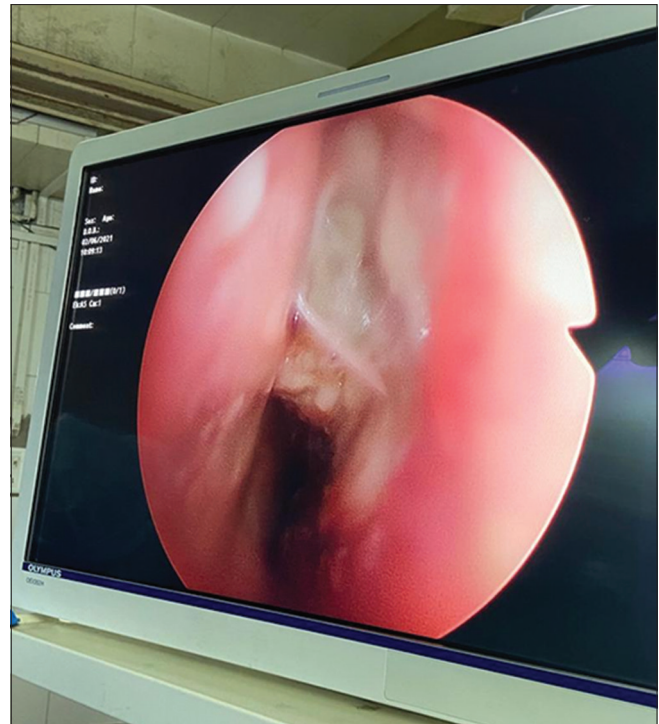
Intraoperative blood sugar charting was done and managed with insulin and fluids as per diabetes ketoacidosis (DKA) management protocol. Haemodynamic parameters were stable intraoperatively, and she was extubated uneventfully. All necrosed parts of nasal cavity and maxillary sinuses were debrided endoscopically [Figure 1] and sent for histopathology testing which confirmed mucormycosis. Since the patient had tested negative preoperatively, her antibody titres were sent in the post-operative period which came out to be positive.

There are many risk factors for mucormycosis like haematological malignancies, transplant, renal failure, acute trauma, malnutrition, etc.<sup>[2]</sup> DM is an independent risk factor for mucormycosis. It has also been reported recently that COVID-19 also causes raised blood sugar levels in previously normoglycaemic patients;<sup>[3]</sup> furthermore, it is increased by liberal use of steroids in COVID-19. The infection due to COVID-19 made her blood sugars rise exponentially and led to DKA which enabled the fungi to get access. This is evidenced by multiple studies.<sup>[4,5]</sup> Rhino-orbital cerebral mucormycosis is most common among diabetics. Iron overload and free ferritin levels have also been associated with mucormycosis.<sup>[6]</sup> Acidotic conditions like DKA cause increased iron to get released and provide optimal growing conditions for fungal hyphae. It is also seen that hyperglycaemia and acidosis negatively impact neutrophil chemotaxis and phagocytosis which raises susceptibility to infections.<sup>[7]</sup>

Reporting this case, we urge to keep a high degree of suspicion for mucormycosis whenever a patient comes with complaints of facial swelling and pain in current scenario. Even a single episode of fever in a child should not be ignored, and despite a negative test, COVID-19 should be kept as a probable differential in all diabetics.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal.



**Figure 1:** Endoscopic view of nasal cavity and maxillary sinus

The guardian understands that names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

#### Financial support and sponsorship

Nil.

#### Conflicts of interest

There are no conflicts of interest.

**Jyotsna Kubre, Vandana Pandey, Tahir Ali Khan,  
Yashwant Dhawale**

Department of Anaesthesia, Gandhi Medical College, Bhopal,  
Madhya Pradesh, India

#### Address for correspondence:

Dr. Vandana Pandey,  
B79, Rajved Colony, Nayapura, Kolar Road, Bhopal - 462 042,  
Madhya Pradesh, India.  
E-mail: pandeyvandana92@gmail.com

**Submitted:** 25-Jun-2021

**Revised:** 20-Aug-2022

**Accepted:** 24-Feb-2023

**Published:** 11-May-2023

#### REFERENCES

1. Pongas GN, Lewis RE, Samonis G, Kontoyiannis DP. Voriconazole-associated zygomycosis: A significant consequence of evolving antifungal prophylaxis and immunosuppression practices. *Clin Microbiol Infect* 2009;15:93-7.
2. Malhotra N, Bajwa SJ, Joshi M, Mehdiratta L, Kurdi M. Second

wave of COVID-19 pandemic and the surge of mucormycosis: Lessons learned and future preparedness: Indian Society of Anaesthesiologists (ISA National) advisory and position statement. *Indian J Anaesth* 2021;65:427-33.

3. Singh AK, Gupta R, Ghosh A, Misra A. Diabetes in COVID-19: Prevalence, pathophysiology, prognosis and practical considerations. *Diabetes Metab Syndr* 2020;14:303-10.
4. Chakrabarti A, Das A, Sharma A, Panda N, Das S, Gupta KL, *et al.* Ten years' experience in zygomycosis at a tertiary care centre in India. *J Infect* 2001;42:261-6.
5. Sundaram C, Mahadevan A, Laxmi V, Yasha TC, Santosh V, Murthy JMK, *et al.* Cerebral zygomycosis. *Mycoses* 2005;48:396-407.
6. Artis WM, Fountain JA, Delcher HK, Jones HE. A mechanism of susceptibility to mucormycosis in diabetic ketoacidosis: Transferrin and iron availability. *Diabetes* 1982;31:1109-14.
7. Chinn RY, Diamond RD. Generation of chemotactic factors by *Rhizopus oryzae* in the presence and absence of serum: Relationship to hyphal damage mediated by human neutrophils and effects of hyperglycemia and ketoacidosis. *Infect Immun* 1982;38:1123-9.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
Quick response code	Website: <a href="https://journals.lww.com/ijaweb">https://journals.lww.com/ijaweb</a>
	DOI: 10.4103/ija.ija_583_21

**How to cite this article:** Kubre J, Pandey V, Khan TA, Dhawale Y. A toddler infected with mucormycosis – reporting the youngest case of mucormycosis in post COVID phase. *Indian J Anaesth* 2023;67:478-80.

© 2023 Indian Journal of Anaesthesia | Published by Wolters Kluwer - Medknow