



First Case of Mucormycosis Death at a Tertiary Hospital in Sudurpashchim Province of Nepal

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Abstract

Fungal infection is mucormycosis, commonly known as black fungus, caused by severe fungal infection developing an epidemic within a global pandemic of COVID-19. Nepal has reported the first cases of black fungus that mostly reported thousands of COVID-19 patients in neighboring countries of India. Therefore, the government of Nepal should be developed for an identification protocol to ensure effective early screening, diagnosis, treatment, and management in the current scenario of Nepal population to tackle against the fungal infection on going global pandemic COVID-19.

Received: Aug 09, 2022

Accepted: Sep 01, 2022

Published Online: Sep 05, 2022

Journal: Annals of Epidemiology and Public health

Publisher: MedDocs Publishers LLC

Online edition: <http://meddocsonline.org/>

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Keywords: Mucormycosis; black fungus; COVID-19; Nepal.



Cite this article: Shah Y, Joshi J, Shahi R, Joshi CR, Gupta GP, et al. First Case of Mucormycosis Death at a Tertiary Hospital in Sudurpashchim Province of Nepal. *A Epidemiol Public Health*. 2022; 5(2): 1086.

Editorial

As the novel coronavirus diseases (COVID-19) continues to increase with infectious and virulent delta variant strains (B.1.617.2 and B.1.617.2.1 or AY.1) in different areas in the world, a rapid increase in the number of opportunistic fungal infection has been reported. It is one of such fungal infection is Mucormycosis, commonly known as black fungus, which is a severe fungal infection caused by a group of molds called mucormyctes [1,2]. Nonetheless aspergillosis and candidiasis are the most reported fungal infections in patients suffering from COVID-19 diseases. However, few cases of mucormycosis have been reported [3]. These molds live throughout the environment but mainly affect those people who have reemerged fungal infection, life-threatening infections particularly in immunocompromised patients including common clinical manifestations including rhino, cerebral, cutaneous, pulmonary, gastrointestinal and disseminated infections and others i.e. organ transplants surgeries kidney dialysis patients [4-6]. "Globally, the reported burden of mucormycotic cases (71% of the global cases) is highest in neighbouring countries i.e India. In contrast, there are reports of sporadic cases of Mucormycosis intimately linked to COVID-19 infections in other parts of the world" [7]. The study showed that most of the high mortality rates of 38%-56.5% of infection cases were occurred in transplant surgeries, and majority of renal transplant patients. Similarly, commonly affects the sinuses or lungs after inhaling fungal spores from the air [1].

Nepal has reported the first cases of black fungus that mostly reported thousands of COVID-19 patients across a neighboring countries of India and Nepal [8]. The first case was reported in a 65 years old man resident in Kailali district. He was suffering from multiple diseases i.e. critical kidney disease, blood pressure and diabetes with having left face swollen and low lip turned into black who were treated at the intensive care unit at Sudarpaschim Tertiary Hospital. The patient initial diagnosis was performed by Computerized Tomography (CT) scans with temporal lobe encephalitis. In the present report, a patient had

signs and symptoms of COVID-19 and tested positive by RT-PCR. Physicians involving in the treatment suggested skin scrapping from the black swollen lips and laboratory investigation results showed fungal hyphae in 10% KOH microscopy. Further examination by hematoxylin and eosin stained biopsy samples from the nasal cavity and lower lips sections of patient revealed necrotic debris and admixed inside numerous broad non-septate hyphae with angle branching impression of mucormycosis [9-11]. However, failed to isolate mucormycosis colonies from Sabouraud dextrose agar culture. Based on diagnosis report, physician immediately start treatment with liposomal amphotericin B injection but unable to save the life of suffering mucormycosis patient. Later, the patient was declared died on June 3, 2021 from mucormycosis at Seti Provincial Hospital [9-13]. According to physician revealed that liposomal amphotericin B drug was very expensive in Nepalese market and could not affordable drug cost range from NRS 60,000 in the international market [14]. Overall, 31 confirmed cases of mucormycosis have been reported in different tertiary care hospitals in Nepal from May-June 2021-2022 (details shown in **Table 1** & **Figure 1**). Furthermore, more research studies will be needed to clearly understand the relationship between COVID-19, Non-COVID-19 patients with mucormycosis among immunocompromised patients.



Figure 1: Consent with permission was taken photo from mucormycosis patients for publication. Mucormycosis (Black fungus) spots in lips with black circle in photo.

Table 1: Mucormycosis (Black flungus) cases have been reported in different tertiary care hospitals in Nepal from May-June 2021-2022 [14].

Date	Number of patients	Hospital	Location	Pre-diagnosis	Diagnosis Fungal infection	Remarks	Reference
May-June 2021	18	Tribhuvan University teaching hospital	Kathmandu, Nepal	Diabetic COVID-19	Mucormycosis (Black fungus)	2 died and 16 recovered	[14]
May 2021	6	Unified COVID-19 hospital	Kathmandu, Nepal	COVID-19	Mucormycosis	3 died and 3 recovered	[14]
May 2021	1	Lumbini Provincial Hospital	Butwal, Nepal	COVID-19	Mucormycosis	Died	[14]
May 2021	4	Bheri Hospital	Nepalgunj, Nepal	COVID-19	Mucormycosis	One had died	[14]
3 June 2021 2 June 2022	2	Seti Provincial Hospital	Kailali, Nepal	Both are Kindey diseases having Dialysis patients (Patient 2: Creatinine:24.38 [High] Normal range :0.40-1.40 mg/dl; Potassium (K+): 6.4 [high]; MCV; 92.80 mg/dl [High], Lymphocte: 19.40 mg/dl Low; Monocytes: 6.40 mg/dl	Mucormycosis (Black fungus)	1 died and 1 recovered	[14]
Total	31						

The Government of Nepal (GON) and Province government (PG) should take urgent action plan to prevent further devastating outbreak of black fungus among the immunocompromised patients among the COVID-19 patients. However, treatment of mucormycosis is one of challenging for prevention and control of mucormycosis infection in resource settings countries like Nepal. It will be strongly recommendation to GON and PG to establish post-COVID-19 wards and treatment facilities for those patients suffering from COVID-19, post-covid manifestation and other immunocompromised patients. Therefore, the GON should implement a national protocol for the suspicion, screening, diagnosis, treatment and follow-up of this fungal infection in patients suffering from COVID-19.

Contributions

YS, DKP, KP, SPD, SP, KK, GPG and BDP conceptualized and developed the outline for this manuscript. AP, UM, YS, SPD, JJ, DP, RS and KP developed the first draft. YS, GPG, SP, DP, RS, JJ, AP, DKP, SPD, KP, KK, AP, UM and BDP contributed to data acquisition and further review of the manuscript. The authors read and approved the final manuscript.

Acknowledgement

The authors thanks to Seti Provincial Hospital and Life Care Diagnostics and Research Center Pvt Ltd, Dhangadhi, Kailali, Nepal for providing laboratory data.

Contributions

YS, DKP, KP, SPD, SP, KK, GPG and BDP conceptualized and developed the outline for this manuscript. AP, UM, YS, SPD, JJ, CRJ, DP, RS and KP developed the first draft. YS, GPG, SP, DP, RS, JJ, AP, DKP, SPD, KP, KK, AP, UM and BDP contributed to data acquisition and further review of the manuscript. The authors read and approved the final manuscript.

Funding: No funding was received.

Competing interests: The authors declare no competing interests.

Ethical approval and consent to participate

Written and verbal consent was taken from patient family for this current publication.

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