colonization cases ($P = .01$). The reduction of cases of KPC-KP colonization cannot be attributed to a lower intensity of monitoring strategy, which was strictly adhered to during period 2.

Despite the application of infection control measures, nosocomial transmission of KPC-KP represented an unsolved problem along the last decade at our institution.[6,7] Since March 2020, an important reduction of KPC-KP cases has been observed at the hematology departments,[9] which has resulted in the progressive reduction of cases of colonization in discharged patients who eventually attended the HEU. Thus, few cases of primary colonization were observed at the HEU during the second half of period 2. The COVID-19–related infection control measures led to decreased spread of KPC-KP, with a 90% reduction of secondary cases at the HEU even though this service is characterized by unpredictable and intensive care activities with high infectious risk.

Infection control measures for KPC-KP are similar to those implemented during the COVID-19 pandemic.[10] However, according to our experience, the infection control procedures recommended for the prevention of nosocomial infections have been more effective during the COVID-19 period than in the past. The concern about being infected by SARS-CoV-2 or about transmitting it to patients and/or family members has probably strengthened compliance with certain measures, such as hand hygiene and social distancing, by healthcare personnel and patients themselves.

In conclusion, the strategies that we put in place in our institution, including the HEU dedicated to outpatients, successfully prevented the transmission of SARS-CoV-2 to hospitalized patients and avoided the horizontal transmission of KPC-KP.

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References

1. Chen B, Wang M, Huang X, *et al.* Changes in incidence of notifiable infectious diseases in China under the prevention and control measures of COVID-19. *Front Public Health* 2021;9:728768.
2. Ullrich A, Schranz M, Rexroth U, *et al.* Impact of the COVID-19 pandemic and associated nonpharmaceutical interventions on other notifiable infectious diseases in Germany: an analysis of national surveillance data during week 1-2016–week 32-2020. *Lancet Reg Health Eur* 2021;6:100103.
3. O'Toole RF. The interface between COVID-19 and bacterial healthcare-associated infections. *Clin Microbiol Infect* 2021;27:1772–1776.
4. Gaspari R, Spinazzola G, Teofili L, *et al.* Protective effect of SARS-CoV-2 preventive measures against ESKAPE and *Escherichia coli* infections. *Eur J Clin Invest* 2021;51:e13687.
5. Falcone M, Tiseo G, Arcari G, *et al.* Spread of hypervirulent multidrug-resistant ST147 *Klebsiella pneumoniae* in patients with severe COVID-19: an observational study from Italy, 2020–21. *J Antimicrob Chemother* 2022:dkab495.
6. Micozzi A, Gentile G, Minotti C, *et al.* Carbapenem-resistant *Klebsiella pneumoniae* in high-hematological patients: factors favoring spread, risk factors, and outcome of carbapenem-resistant *Klebsiella pneumoniae* bacteremias. *BMC Infect Dis* 2017;17:203–215.
7. Micozzi A, Gentile G, Santilli S, *et al.* Reduced mortality from KPC-*K. pneumoniae* bloodstream infection in high-risk patients with hematological malignancies colonized by KPC-*K. pneumoniae*. *BMC Infect Dis* 2021;21:1079.
8. Girmenia C, Gentile G, Micozzi A, *et al.* COVID-19 in patients with hematologic disorders undergoing therapy: perspective of a large referral hematology center in Rome. *Acta Haematol* 2020;143:574–582.
9. Micozzi A, Assanto GM, Cesini L, *et al.* Reduced transmission of *Klebsiella pneumoniae* carbapenemase-producing *K. pneumoniae* (KPC-KP) in patients with haematological malignancies hospitalized in an Italian hospital during the COVID-19 pandemic. *JAC Antimicrob Resist* 2021;17(3):dlab167.
10. Tsioutis C, Eichel VM, Mutters NT. Transmission of *Klebsiella pneumoniae* carbapenemase (KPC)–producing *Klebsiella pneumoniae*: the role of infection control. *J Antimicrob Chemother* 2021;76 suppl 1:i4–i11.

Antifungal drug shortage in India amid an increase in invasive fungal functions during the coronavirus disease 2019 (COVID-19) pandemic

Ashitha B. Arun[1], Mohammad Mehedi Hasan[2], Sudhan Rackimuthu[3], Irfan Ullah[4], Tanveer Mir[5] and Anwesha Saha[6]

[1]St Joseph's College, Bangalore, India, [2]Department of Biochemistry and Molecular Biology, Faculty of Life Science, Mawlana Bhashani Science and Technology University, Tangail, Bangladesh, [3]Father Muller Medical College, Mangalore, Karnataka, India, [4]Kabir Medical College, Gandhara University, Peshawar, Pakistan, [5]Department of Internal Medicine, Wayne State University, Detroit, Michigan, United States and [6]Department of Biotechnology; Heritage Institute of Technology, Kolkata, West Bengal, India

To the Editor—Even as India is struggling to recover from an annihilating second wave of the coronavirus disease 2019 (COVID-19) pandemic, a rare yet lethal fungal infection mucormycosis caused by *Mucormycetes*, colloquially called the "black fungus," is wreaking new havoc at alarming rates. This opportunistic disease is infecting patients that have recovered or are recovering from COVID-19.[1,2]

More concerning than the infection itself is the shortage of the antifungal drug used for its treatment, amphotericin B. The pandemic has disrupted entire global supply and manufacture chains, causing a dire shortage of this essential drug. As the country witnesses a 2-fold increase in the number of mucormycosis cases, the government is scrambling to provide treatment for the increasing in-flow of patients. The central government is working to provide free treatment in public hospitals, incentivizing import

Author for correspondence: Mohammad Mehedi Hasan, E-mail: mehedi.bmb.mbstu@gmail.com

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by exempting custom duty on import of the drug, redistributing the drug based on urgency and need, and creating new facilities for treatment. Very little improvement has followed, however, and access to the antifungal amphotericin B remains inadequate.[3]

Manufacturing volumes have been low in India due to previously low occurrence rates. Following the sudden increase in cases, the current volumes of manufacture by Bharat Serums & Vaccines, BDR Pharmaceuticals, Sun Pharma, Cipla, and Life Care Innovations (companies that currently produce the drugs) are not sufficient to meet the needs of the country. Hence, India is more likely to become dependent on imports from companies like the major US pharmaceutical producer Gilead Sciences, which could be significantly delayed.[4,5]

An added burden amid the distressing situation is the emergence of other invasive fungal infections, such as candidiasis, also referred to as "white fungus," alongside aspergillosis. *Candida auris*, one of the organisms implicated in candidemia, is known to cause serious multidrug-resistant nosocomial infections. In a recent study, nearly all cases of *Candida auris* were fluconazole resistant, and close to 40% were resistant to amphotericin-B.[2] Further increases in drug-resistant fungal infections would prove disastrous in India, where the health system has already been stressed to its maximum capacity by the COVID-19 pandemic.[6]

The drug resistance that is increasingly occurring in a variety of pathogens especially in the Indian context can be attributed to the widespread and injudicious use of medications prescribed by physicians as well as self-medication among the public. With drug-resistant fungi surfacing, research is urgently needed to identify effective drugs and alternative treatment modalities to curb the negative health outcomes related to these deadly and invasive infections. Just as urgently, antibiotic stewardship must be promoted and practiced throughout the healthcare system.[7]

With the pandemic still looming, local pharmaceutical production must be undertaken to meet these demands and to simultaneously reduce dependency on expensive imports. Better policies related to drug manufacture, contingency, import, and distribution should be developed and enforced. In-house production must be encouraged to combat the pandemic and to prepare for future outbreaks. Apart from all this, the ancient field of herbal and indigenous medicine in India, such as Ayurveda and Unani, should be re-examined and probed in the hope of finding replacements and/or cheaper, safe treatment options.[8]

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References

1. Rocha ICN, Hasan MM, Goyal S, *et al.* COVID-19 and mucormycosis syndemic: double health threat to a collapsing healthcare system in India. *Trop Med Int Heal* 2021;26:1016–1018.
2. Ghosh S, Patelia S, Hasan MM, Ghosh A, Jain S, Patel T. Drug-resistant white fungus: another catastrophic fungus emergence amidst COVID-19 in India. *Pathog Glob Health* 2021. doi:10.1080/20477724.2021.1960762.
3. Gowda SS. Fresh allocation of amphotericin B in view of rising mucormycosis cases. India Ministry of Chemicals and Fertilizers website. https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1720822. Published 2021. Accessed September 22, 2021.
4. Explained: Why there is shortage of black fungus drug in India. *The Indian Express* website. https://indianexpress.com/article/explained/shortage-of-black-fungus-drug-cases-india-7330327/. Published 2021. Accessed August 8, 2021.
5. Black fungus: another batch of amphotericin B injection reaches India. Livemint website. https://www.livemint.com/news/india/black-fungus-another-batch-of-amphotericin-b-injection-reaches-india-11622337883645.html. Published 2021. Accessed August 8, 2021.
6. Ghosh S, Moledina N, Hasan MM, Jain S, Ghosh A. Colossal challenges to healthcare workers combating the second wave of coronavirus disease 2019 (COVID-19) in India. *Infect Control Hosp Epidemiol* 2021. doi: 10.1017/ICE.2021.257.
7. Rajendran A, Kulirankal KG, Rakesh PS, George S. Prevalence and pattern of antibiotic self-medication practice in an urban population of Kerala, India: a cross-sectional study. *Indian J Commun Med* 2019; 44 suppl 1:S42.
8. Mishra A, Bentur SA, Thakral S, Garg R, Duggal B. The use of integrative therapy based on Yoga and Ayurveda in the treatment of a high-risk case of COVID-19/SARS-CoV-2 with multiple comorbidities: a case report. *J Med Case Rep* 2021;15:95.

Needlestick and sharp injuries among healthcare workers prior to and during the coronavirus disease 2019 (COVID-19) pandemic

Josip Stojic MD[1], Vlatko Grabovac MD[1] and Marko Lucijanic MD, PhD[2,3]

[1]Department of Emergency Medicine, University Hospital Dubrava, Zagreb, Croatia, [2]Department of Hematology, University Hospital Dubrava, Zagreb, Croatia and [3]University of Zagreb School of Medicine, Zagreb, Croatia

To the Editor—The coronavirus disease 2019 (COVID-19) pandemic has brought various changes to healthcare systems globally. It has showcased the vulnerability of healthcare workers (HCWs) and has demonstrated the importance of ensuring their safety.[1] Personal protective equipment (PPE), in addition to providing protection, imposes some restrictions for everyday clinical work. A decrease in the number of needlestick and sharp injuries (NSIs) among HCWs during the COVID-19 pandemic has been reported in an institution treating a heterogenous population of patients.[2] We evaluated NSIs among HCWs in our completely repurposed and dedicated COVID-19 tertiary-care center prior to and during the pandemic.

Author for correspondence: Josip Stojic, E-mail: josip.stojic95@gmail.com

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