Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Surveillance for COVID-19-associated pulmonary aspergillosis

In *The Lancet Microbe*, Paul Verweij and colleagues[1] highlighted the challenges in diagnosing COVID-19-associated pulmonary aspergillosis. In this Correspondence, we report our insight.

Several European case series have reported a high incidence of putative COVID-19-associated pulmonary aspergillosis (19–33% of intubated patients).[2–4] In response, we initiated a surveillance strategy for secondary fungal infections in intubated patients with COVID-19 at our tertiary referral hospital in London, UK. Weekly serum 1–3-β-D-glucan (Fungitell, CapeCod, MA, USA) and galactomannan (Platelia Aspergillus EIA, BioRad, Redmond, WA, USA) testing was done. Given the need to limit aerosol-generating procedures, deep respiratory sampling was only done at the physician's discretion. Any bronchoalveolar lavage or endotracheal aspirates were tested for galactomannan as per the manufacturer's recommendations for bronchoalveolar lavage. If positive (galactomannan index [GMI] ≥1·0), *Aspergillus* PCR was done from 1 mL of endotracheal aspirates deposit, which was ribolysed, and DNA was extracted using a DNA tissue method (EZ1, Qiagen, Hilden, Germany). Real-time PCR was done using AsperGenius assay (Bruker, Bremen, Germany).

From April 12 to May 26, 2020, 62 patients were screened (51 [82%] men, 11 [18%] women, median age 59 years, range 24–74 years). During this period, 24 (39%) of 62 patients died and seven (11%) patients had one or more positive fungal biomarkers (appendix). All serum galactomannan tests were negative (GMI <0·5). 1–3-β-D-glucan was positive (>80 pg/mL) in three (5%) patients: one patient with candidaemia, one patient with suspected candidiasis, and one patient with no diagnosis of invasive fungal infection. 85 endotracheal aspirates were tested for galactomannan; six (10%) of 62 patients had positive results, of which five (83%) of the samples tested positive by *Aspergillus* PCR and two (33%) of the samples grew *Aspergillus fumigatus* in culture.

Because of the absence of consensus criteria for COVID-19-associated pulmonary aspergillosis, definitions for post-influenza aspergillosis were applied.[5] None of our patients met this case definition for COVID-19-associated pulmonary aspergillosis, which was problematic for two reasons. First, all patients with severe COVID-19 have pulmonary infiltrates; therefore, the radiological criterion is not useful.[5] Second, bronchoalveolar lavage samples were not available and whether galactomannan positivity of endotracheal aspirates is an acceptable substitute criterion is unclear; this could reflect upper airway colonisation rather than disease. Overall, we clinically suspected two (3%) of 62 patients screened to have COVID-19-associated pulmonary aspergillosis, a substantially lower proportion than in previously reported case series. Notably, both patients had host factors (defined by the European Organisation for the Research and Treatment of Cancer and the Mycoses Study Group Education and Research Consortium) for invasive aspergillosis (appendix).

Our experience further highlights the difficulty in defining and diagnosing COVID-19-associated pulmonary aspergillosis. There is clearly a need for ongoing surveillance and improved diagnostic strategies for this complication.

See Online for appendix

We declare no competing interests.

*Li-An K Brown, Jayne Ellis, Rebecca Gorton, Surjo De, *Neil Stone*
neil.stone@nhs.net

Institute of Immunity and Transplantation, Division of Infection and Immunity, University College London, London, UK (L-AKB); Hospital for Tropical Diseases (JE, NS) and Department of Microbiology (SD, NS), University College Hospital, London NW1 2BU, UK; and Health Services Laboratories, London, UK (RG)

1 Verweij PE, Gangneux J-P, Bassetti M, et al. Diagnosing COVID-19-associated pulmonary aspergillosis. *Lancet Microbe* 2020; **1:** e53–55
2 Koehler P, Cornely OA, Böttiger BW, et al. COVID-19 associated pulmonary aspergillosis. *Mycoses* 2020; **63:** 528–34.
3 van Arkel ALE, Rijpstra TA, Belderbos HNA, van Wijngaarden P, Verweij PE, Bentvelsen RG. COVID-19 associated pulmonary aspergillosis. *Am J Respir Crit Care Med* 2020; published online May 12. https://doi.org/10.1164/rccm.202004-1038LE.
4 Alanio A, Dellière S, Fodil S, Bretagne S, Mégarbane B. Prevalence of putative invasive pulmonary aspergillosis in critically ill patients with COVID-19. *Lancet Respir Med* 2020; **8:** e48–49.
5 Schauwvlieghe AFAD, Rijnders BJA, Philips N, et al. Invasive aspergillosis in patients admitted to the intensive care unit with severe influenza: a retrospective cohort study. *Lancet Respir Med* 2018; **6:** 782–92.