

Fungal infections might be dangerous to Covid-19 patients with severe symptoms in ICU

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Covid-19 patients with severe symptoms who end up in intensive care units in hospitals are at risk of contracting an invasive fungal infection that might influence their outcomes and hamper treatment efforts. These fungal co-infections in Covid-19 patients on ventilators may contribute to the high mortality rate of these patients.



Prof Carlien Pohl-Albertyn from the Department of Microbiology and Biochemistry at the University of the Free State is the NRF SARCHI research chair in Pathogenic Yeasts.



Dr Obinna Ezeokoli is from the Pathogenic Yeast Research Group in the Department of Microbiology and Biochemistry, Faculty of Natural and Agricultural Sciences at the University of the Free State (UFS)

Prof [Carlien Pohl-Albertyn](#) and Dr Obinna Ezeokoli from the [Pathogenic Yeast Research Group](#) in the [Department of Microbiology and Biochemistry](#), Faculty of Natural and Agricultural Sciences at the University of the Free State (UFS), have recently published an article on the incidence of fungal infection in Covid-19 patients. They are also in the process of publishing another article on the potential risk factors of Covid-19 treatment for getting fungal infections.

Severe Covid-19 causes changes in the immune system

Pohl-Albertyn, who is the NRF SARChI Research Chair in Pathogenic Yeasts, says there are several reasons why Covid-19 patients who end up with severe symptoms in intensive care units (ICUs) are at risk of fungal infections.

“Severe Covid-19 causes changes in the immune system, such as increased release of cytokines (molecules involved in inflammation) and a decrease in certain white blood cells (which help to fight other infections). These changes might make patients more susceptible to invasive fungal infections. Severe Sars CoV-2 infection also damages the lung tissue, making it easier for inhaled fungi (such as *Aspergillus* species, *Cryptococcus neoformans*, and mucoralean fungi) to cause invasive infections,” explains Pohl-Albertyn.

Many of the patients with severe Covid-19, continues Pohl-Albertyn, have other co-morbidities (including diabetes) that make them more susceptible to fungal infections. Patients with severe Covid-19 in ICUs are often ventilated and have central venous catheters as well as urinary catheters. These are also risk factors for fungal infections.

“Some drugs, such as corticosteroids used to treat the symptoms of severe Covid-19, may increase the risk of fungal infection – although the link between these drugs and fungal infection in Covid-19 has not been well studied yet. Some patients may be given broad-spectrum antibiotics to treat or prevent bacterial co-infection. These antibiotics could also kill the ‘good bacteria’ that help to keep the fungi in and on your body in check. If they are removed, the fungi that colonise the patients may overgrow and cause infection,” says Pohl-Albertyn.

Any systemic fungal infection can be deadly

According to her, any systemic fungal infection can be deadly, so in patients with Covid-19 it is definitely cause for concern. In a recent study done on the tissue of patients who died from Covid-19 after long-term treatment, fungal infections were a constant finding in these patients, even though the infection was not detected while they were alive. One of the problems is that patients with severe Covid-19 are not routinely tested for fungal co-infection.

In their recent article published in the *South African Medical Journal*, Pohl-Albertyn and Ezeokoli write that the incidence of severe infection and mortality in Covid-19 is thought to be due in part to a lack of natural immunity and to viral replication in the lower respiratory tract, as well as superinfections, secondary infections, or co-infections (these terms are often used interchangeably), leading to severe lung injury and acute respiratory distress syndrome (ARDS).

“Co-infections with respiratory viruses (other than Sars-CoV-2), bacteria, and fungi have been reported in Covid-19 patients all over the world, and secondary infections have been identified as one of the predictors of a fatal outcome in Covid-19 cases. An earlier report from China suggests that the mortality rate for Covid-19 patients on ventilators in intensive care units (ICUs) is ~60%, and further indicated that invasive fungal co-infections may contribute to this high mortality.

A South African perspective

The researchers also report that studies conducted before the current Covid-19 pandemic have shown that fungal infections are highly prevalent in the South African population, partly owing to the high incidence of HIV.

According to their article, it was observed that the *Candida* carrier rate is higher in the South African population than elsewhere and that HIV-positive patients carry more, and a greater variety of pathogenic yeasts compared to HIV-negative subjects. Similarly, cryptococcal meningitis, caused by the *Cryptococcus neoformans* species complex, is one of the leading causes of HIV-related deaths in South Africa, with >135,900 deaths estimated for sub-Saharan Africa in 2014.

Other fungal infections, including invasive aspergillosis, *Pneumocystis pneumonia*, and endemic mycoses, are also prevalent in South Africa. "Given the high prevalence of HIV/AIDS in South Africa as well as the high number of persons undergoing immunosuppressive therapies for other illnesses, co-infections with opportunistic fungal species may be affecting the current Covid-19 disease statistics in South Africa."

A serious fungal infection has the ability to kill you, and yet few people – especially those with a weakened immune system – are aware of this lurking danger. Just like bacteria, these minute life forms are becoming resistant to the handful of treatment options.

Pohl-Albertyn and her team at the university are studying this neglected field, which annually claims the lives of 1,7 million people worldwide. It is estimated that more than 3,2 million South Africans are afflicted by fungal diseases each year.

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University of the Free State

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