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CANDIDA AURIS AS A SIGNIFICANT EMERGING HUMAN FUNGAL PATHOGEN

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The COVID-19 pandemic has taken resources away from combating and tracking the fungi, which has led to outbreaks [1]. In hospitalized patients, COVID-19 has aggravated various underlying illnesses, leading to a rise in bacterial, viral, and fungal coinfections. Moreover, during the pandemic, shortages of personal protective equipment forced medical personnel to reuse personal protective equipment and masks, which contributed to the spread of fungi [2, 3]. Because of high mortality rates, a lack of diagnostic options, rising levels of antifungal resistance, and severe clinical manifestations, fungal infections provide a particularly difficult challenge [4]. One such fungal disease that causes epidemics in COVID-19 intensive care units and hospitals all throughout the world is *Candida auris* [5]. Therefore, *Candida auris* is not an issue that occurred during the COVID-19 pandemic but was not appropriately recognized at the time, as fungal coinfections were not considered in the first line of diagnostic procedures.

According to the most recent warning published by the Centers for Disease Control and Prevention (CDC) on March 20, 2023, medical professionals are expressing grave concern over the rapidity of *Candida auris*. In 2016, the illness was found for the first time in the United States, since the end of 2021, there were 3.270 confirmed cases of infection and 7,413 confirmed cases of *Candida auris* carrier. The number of people who did not react to the medicine that was suggested the most (echinocandins) quadrupled in the year 2020–2021, which was the year when the largest number of infections was reported. During this time span, there were also three times as many people who were infected with the virus and who were carriers as there were in 2019. The early data from the CDC indicate that there were 2,377 clinical cases in 2022, which is an increase from the number of 1,471 in 2021 [6]. Such a rapid increase in the population of infected and carriers raises serious concerns about the spread of the disease. It is important to keep in mind that in addition to the individuals who are afflicted by this pathogen, there is also an extremely high percentage of carriers. These individuals can serve as potential sources of infection for the most susceptible populations, or they can become ill themselves if there is a significant reduction in immunity. This group ought to be watched with regard to the strains that they carry, and preventative steps need to be adopted in the form of recommendations with the purpose of eradicating the pathogen. Because traditional phenotypic typing approaches were not utilized in the search for *Candida auris* until very recently, one theory argues that this pathogen was not discovered until much more recently [7]. Some sources claim up to 90% of isolates are misdiagnosed, *Candida auris*

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frequently goes undetected in clinical microbiology laboratories. Problems with identification and misdiagnosis make combating the infection, which is already tough to treat, even more challenging [8]. Additionally, the information that patients with *Candida auris* constantly expel live yeast cells from their skin, which results in the contamination of hospital surroundings, lends credence to the rapid spread of the pathogen. This information demonstrates that patients with *Candida auris* contribute to the rapid spread of the pathogen.

Both *Candida auris* and SARS-CoV-2 were found in a hospital setting, including on IV poles, bed rails, hospital floors, windows, air conditioner ducts, and other hospital surfaces [9]. Moreover, it has been reported that more than 90% of the *Candida auris* isolates are resistant to fluconazole (azole), however, the degrees of resistance might vary quite a little amongst different clades. Many investigations have found that the minimum inhibitory concentrations (MIC) for amphotericin B (polyene) are high, and there is a developing resistance to echinocandins in the isolates of several nations [10]. According to the MIC breakpoints, a significant number of isolates exhibit resistance to numerous types of medicines. It has been discovered that certain *Candida auris* isolates from the United States are resistant to all three kinds of antifungal medication. In the United States, around 90% of *Candida auris* isolates tested positive for resistance to fluconazole, approximately 30% of *Candida auris* isolates tested positive for resistance to amphotericin B, and less than 5% of *Candida auris* isolates tested positive for resistance to echinocandins. These percentages can contain numerous isolates from the same person, and they might shift as more isolates are examined and analyzed [11]. As a result of *Candida auris*, it is essential to research and develop new antifungal medications, as those already available may soon lose all effectiveness against this fungus. In most cases, the fungus does not pose a risk to people who are healthy. Individuals with a weakened immune system or those with lengthy or frequent stays in healthcare institutions are more likely to get it. As COVID-19 attacks the immune system severely, leading to an increased chance of coinfections and increased severity of other diseases, the death rate of coinfection of COVID-19 and fungi is probably very high. *Candida auris* has been linked to bloodstream infections and even fatalities, particularly in people with significant medical conditions who are residing in healthcare facilities such as hospitals and nursing homes.

The most typical signs and symptoms of a *Candida auris* infection include a high temperature, chills, sweating, and a decrease in blood pressure. Patients of all ages, from premature newborns to the elderly, have been discovered to be infected with various pathogens [12]. Pregnant women also have a weakened immunological response making them potentially susceptible to infection with *Candida auris*. Nevertheless, there have been no reports of infection during the pregnancy. The *Candida auris* infection has a general death rate of 52.5% across the board. The global numbers range from 30 to 59%, while 30–72% of patients pass away due to nosocomial illnesses. Tracheotomy, enteral nutrition, insertion of a venous, urological, or hemodialysis catheter, and stoma are all procedures that increase massively mortality. This percentage is at its maximum when numerous antibiotics are being administered (84.3%), when the patient is admitted to the Intensive Care Unit (78.7%), when they are receiving mechanical ventilation (78.7%), and when they have comorbidities (68.5%) [13]. For this reason, *Candida auris* was included in the World Health Organization (WHO) list of the most dangerous fungi for humans. Even though fungal infections are frequently linked to high mortality rates, they are still not widely recognized as clinically significant etiological factors in the development of infectious illnesses and as the primary cause of fatalities due to these conditions. The issue of fungal illnesses spreading from person to person is still a serious worry from a health, epidemiological, and economic point of view, despite the huge achievements that have been made in modern medicine in recent decades. *Candida auris* is the most recent example of this because it is a species that can rapidly spread, is characterized by wide resistance to existing antifungal drugs, and is equipped with a large number of pathogenic factors. It represents a significant danger to human life and health on account of all that has been discussed thus far. With the discovery of the pathogen in question came the difficult task of formulating an effective plan for combating it. There is a need for more research on this pathogen as well as creature testing that are both quick and accurate in order to identify it before it gets widespread. This also applies to the possibility of self-testing procedures, as was in the case of COVID-19, and which will enable contact

with individuals or relatives of patients to be able to swiftly identify the illness [14, 15]. In addition, in order to prevent the further spread of illness, it is essential to develop and implement care and isolation guidelines.

Conflict of interest

All authors declare no conflict of interest.

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