State of The Globe: *Candida auris*-A Global Healthcare Threat

Candida auris (CA) a dreaded, multidrug-resistant (MDR) pathogen, has emerged as a global threat to health care with a crude in-hospital case-fatality rate of 30%–72%.[1] The name "auris" was given because it was first isolated from the ear canal of a hospitalized patient.[2] CA is considered the first example of a new pathogenic fungus emerging from the global warming.[3] The special ability of CA to adapt through the genetic and epigenetic switches first in the environment and then in an avian host is thought to have led to its establishment as a human pathogen.[3] Once established as a pathogen, CA gets easily transmitted among humans, favored by the conditions of high population density, pollution, increased city temperatures, poor hygiene, and frequent international travel.[3]

First identified in 2009, the Centers for Disease Control and Prevention (CDC) had confirmed the presence of CA in 48 countries on six continents by February 2021.[4] The global spread of CA has become so widespread that CDC has now stopped updating the cases of CA outside of the US.[4] CA infection was made notifiable in the US in 2018 and since then US has recorded 1631 clinical cases of CA and 4616 patients with CA colonization.[4] Colonized humans carry CA on the skin, nares, oropharynx, rectum, groin, and many other body parts. They may be totally asymptomatic but they become the vehicles of transmission of CA causing hospital outbreaks with high mortality (30%–72%) among those having candidemia.[1] CA now forms 5%–30% of all reported candidemias in the hospital settings.[1]

The standard biochemical methods and commercially available tests such as VITEK 2 YST, API 20C, BD Phoenix yeast identification system, and MicroScan have been shown to wrongly report CA as other *Candida* species such as *Candida haemulonii, Candida famata, Candida guilliermondii, Candida lusitaniae, and Candida parapsilosis*.[5] The species-level identification of *Candida* may not be available in most laboratories across the world, making it impossible to correctly identify CA. The species-level identification requires more advanced techniques, such as DNA sequencing matrix-assisted laser desorption ionization–time of flight (MALDI-TOF) mass spectrometry (MS), or both.[5]

Ninety percent of the CA isolates were found to be resistant to fluconazole, a drug used as the first-line agent for *Candida* infections.[6] CA was the first *Candida* species to be classified as MDR and some strains of CA are even pan-resistant.[6] Overall, 25% and 13% of isolates were MDR and multiazole resistant, respectively.[6] CA has become a global threat owing to its MDR nature and things are complicated further by the fact that CA is very difficult to identify with standard laboratory tests used in microbiology laboratories worldwide leading to its gross underreporting.[7]

Risk factors for CA infections are similar to those for other *Candida* species that include old age, diabetes, recent surgery, indwelling catheters or medical devices, immunosuppression, neutropenia, chronic kidney disease, broad-spectrum antibiotic, or antifungal drug usage.[2] In addition to candidemia, CA has been reported to cause urinary tract infection, otitis media, wound infections, skin abscesses, myocarditis, meningitis, and osteomyelitis.[1]

CA has distinct virulence mechanisms making it a dangerous pathogen and these include tissue invasion, enzyme secretion, nutrient acquisition, histidine kinase-2 component system, secreted aspartyl proteinases, oligopeptide transporters, mannosyltransfersases, secreted proteases, increased survivability at higher temperatures than other *Candida* species, ability to form biofilms, unique evasion mechanisms to host immune systems, multidrug efflux, genes, and pathways involved in nutrient acquisition and cell wall modeling.[8]

It is imperative to step up the screening and diagnostic facilities for CA in hospital settings, more so in high-population countries like India. Screening for CA among hospitalized patients is an important step in surveillance of this pathogen. Screening is done using a composite swab of the patient's bilateral axilla and groin.[9] The high index of suspicion and species identification of CA are recommended even for *Candida* isolates grown from nonsterile sites unlike the common belief that *Candida* grown from nonsterile sites needs no further identification.[9]

The treatment of CA is indicated only if clinical disease is present. Echinocandin is the first-line therapy for CA infection. If unresponsive to this treatment, a combination of echinocandin and liposomal amphotericin B has better efficacy due to their synergistic actions.[7] The high effectiveness of 1% sodium hypochlorite against CA makes it a potential method for reducing CA transmission in nosocomial settings.[10]

In the absence of the more expensive diagnostic facilities such as MALDI-TOF or MS in low- and middle-income countries physicians must suspect CA in the following settings:[7]

1. If the patient is from an intensive care unit or high-dependency area
2. In patients transferred from other hospitals after a long stay
3. Patients who have undergone multiple interventions
4. *Candida* isolates that are resistant to fluconazole
5. Patients with prior antifungal exposure
6. Whenever a commercial system reports: *C. haemulonii, C. famata, C. guilliermondii, C. lusitaniae, C. parapsilosis,*

Rhodotorula glutinis, Candida sake, and *Saccharomyces cerevisiae*.

The health-care sector must watch for comorbidities, and care and devise long-term policies that facilitate patient-specific care to curb the global menace of CA. Strengthening of microbiological identification capabilities and epidemiological surveillance, treatment, prevention, and containment strategies, combined with better awareness about CA among physicians, microbiologists, and health-care workers are indispensable to limit the further spreading of CA. The breeding grounds and risk factors of *Candida* transmission are present in hospitals so it is crucial to highlight and recognize the possibility of CA outbreaks among these patients.

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