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A Review On Candida Auris

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Abstract

Candida auris is a newly recognized yeast pathogen that was first identified in 2009 in Japan. Since then, it has spread globally and is now a cause of serious infections, particularly in healthcare settings. These infections often lead to high death rates and pose challenges due to antifungal resistance. The yeast can survive in the environment, colonize patients, and avoid standard identification methods, making detection and control difficult. This review compiles current information on the epidemiology, microbiology, pathogenesis, diagnostics, and mechanisms of antifungal susceptibility and resistance of C. auris. It also looks at strategies for preventing and controlling infections. The discussion points out significant gaps in knowledge and urges improvements in surveillance, diagnostics, new treatments, and stricter infection control measures. In conclusion, C. auris is a major emerging fungal threat with many unresolved issues that need immediate attention.

Introduction

Yeasts belonging to the Candida genus are normal residents of human microbiota and opportunistic pathogens in the immunocompromised item, causing candidemia, invasive candidiasis, and other forms of disease. Of the more than 150 described Candida, only a lesser number have been associated with clinically relevant human disease.

C. auris was first described in 2009 from the external auditory canal of a patient in Japan. Since that time, it has been described from all inhabited continents, and associated with nosocomial outbreaks with multidrug-resistance and high case-fatality rates.

C. auris is especially concerning because it can be transmitted from person-to-person (particularly in healthcare settings), it persists on surfaces and medical devices, it is often misidentified in standard labs, and it frequently exhibits high rates of multi-class antifungal resistance.

Taking into consideration these properties, C. auris has emerged as a global public-health threat, increasing our awareness, enhancing testing and diagnosis, as well as infection prevention and treatment options. This review aims to consolidate the current knowledge, present gaps, and identify future directions.

Reviewof literature Epidemiology andemergency

C.auris has been documented from over 40 countries across all inhabited continents. In a systematic review (2019), a meta-analysis recorded 742 isolates in 16 countries from 2013 to 2017, with crude mortality approximated to be 29.8%. Auris mainly occurs in hospitalised, critically ill patients with multiple comorbidities (i.e., diabetes, renal disease,sepsis).

Outbreaks frequently take place in intensive care units, long-term care facilities, and other high-risk environments. Its emergence is proposed to be due to convergent evolution of separate clades in different geographic regions, rather than foci spreading from a single origin.

Microbiology , colonisationand Transmission

C. auris is phylogenetically closely linked to the Candida haemulonii complex and several other atypical Candida species. It can thrive at higher temperatures (e.g., 42 °C) and has specialized assimilation patterns that separate it from other species.

Colonisation (e.g., skin, axilla, groin, nares) often occurs prior to infection. Importantly, C. auris can remain on abiotic surfaces in the healthcare environment, can survive for weeks and 'dry' biofilms and can be resistant to standard disinfection methods. Transmission by means of contact transmission (skin-to-skin contacts or contaminated environment/equipment) rather than airborne route is the main.

Diagnosticandidentificationchallenges

Misidentifying C. auris is a significant obstacle: many routine biochemical identification systems misidentify C. auris as other species, contributing to delays in accurate diagnosis and outbreak control. More accurate identification methods include MALDI-TOF MS (with updated libraries), PCR, sequencing of ITS or D1/D2 regions, and specialized chromogenic media.

Antifungalsusceptibility, Resistancemechanism& Treatment

One of the most concerning properties of C. auris is its multidrug resistance. Most isolates have resistance to azoles (especially to fluconazole) and some strains, amphotericin B and echinocandins. Mechanisms of resistance include mutations in ERG11, which is the azole target, and mutations in FKS1, which is the echinocandin target, upregulation of efflux pumps as well as biofilm-associated tolerance.

Infectionprevention&control

Due to its capacity for persistence, environmental persistence, and transmission in healthcare settings, strong preventive measures from infection are critical: active surveillance of high-risk patients, contact precautions, dedicated equipment, thorough cleaning/disinfection of the environment with C. auris effective agents, and inter-facility discussion when transferring colonised or infected patients.

Discussion

The emergence of C. auris suggests a replacement cover for fungal nosocomial infections: in contrast to many previous Candida species, C. auris has exceptional person-to-person capabilities, environmental persistence and resistance to antifungal agents. These factors cause more potential outbreaks and increase the risk of mortality.

From a diagnostic perspective, the challenges in identifying and under-reporting C. auris continue to be an important barrier. Laboratories without MALDI-TOF with updated libraries, or molecular capacity may not

be able to detect C. auris or accurately identify the organism, which may ultimately lead to delays in recognizing and controlling outbreaks.

Therapeutically, the limited antifungal therapeutic armamentarium and the high rates of resistance limit the management of invasive C. auris infections are challenging. While newer agents show promise, access, cost, and local needed regulatory approvals would limit their use in many areas of the world. The formation of biofilms on implanted medical devices leads to additional challenges in eradication and may need device removal as well as systemic therapy.

Due to the global threat and cross-border nature of outbreaks, international surveillance and collaboration are essential. Furthermore, countries with few mycology diagnostics may underestimate the real burden of C. auris, which can result in silent transmission. For example, some studies in Africa have described under-detection and suggested improved capacity.

Lastly, C. auris is of particular interest within the topic of antimicrobial resistance (AMR) because it is one of the first fungi to develop widespread multidrug resistance, which may portend a new frontier in fungal-AMR. Several public health agencies have already categorized it as an ‘urgent threat’ or high priority pathogen.

Conclusion

Candida auris is a newly recognized fungal pathogen of great concern because of its ability to cause outbreaks in healthcare settings, with high mortality, multidrug resistance, issues in diagnosis, and environmental persistence. Although there has been considerable advancement in understanding its epidemiologic aspects, resistance mechanisms, and infection prevention and control methods, there remain numerous gaps that do not permit effective global control. Urgent priorities to address the C. auris threat include

Improve laboratory diagnostics and surveillance especially in limited-resource settings to provide timely detection and reporting.

Increase access to and judicious use of new antifungal therapies, based on susceptibility testing and stewardship principles.

Create and implement evidence-based IPC guidelines for different healthcare settings using effective cleaning/disinfection practices and screening tests. In conclusion, C. auris represents an increasing complexity of fungal infections in the era of AMR and an increasingly advanced healthcare setting. Forward-thinking and collaborative action is needed to prevent the further spread, achieve optimal patient outcomes, and protect the utility of antifungal medications.

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