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05/28/2024

A case study - 2019 Candida Auris Outbreak in Brooklyn

Introduction:

Candida auris (*C. auris*) is a multidrug-resistant fungal pathogen first identified in Japan in 2009.¹ The fungus targets individuals with weakened immune systems, posing severe challenges to public health due to its resistance to antifungal medications and its propensity to spread in healthcare settings.²

Facts of the Case:

In May 2019, an elderly male patient was admitted to Mount Sinai Hospital, Brooklyn, New York, for abdominal surgery and was subsequently diagnosed with *Candida auris*. Despite appropriate isolation protocols and comprehensive treatment efforts, the patient succumbed after 90 days of hospitalization. Post-mortem environmental testing revealed extensive contamination of the patient's room by *C. auris*. Thus, a rigorous decontamination procedure involving the removal of ceiling and floor tiles was necessary to ensure complete eradication of the pathogen. Other severe outbreaks have been reported in New York, New Jersey, and Illinois. By the time of the 2019 outbreak at Mouth Sinai, *C. auris* had already spread globally for five years.¹ The economic impact of *Candida auris* includes costs for specialized cleaning equipment and extensive environmental remediation. Decontaminating a hospital room can exceed \$2 million per year due to the need for specialized equipment and rigorous cleaning protocols. The overall financial burden on healthcare systems includes direct treatment costs and resources needed for ongoing infection control measures.³ Implementing in-house testing has proven to be cost-effective, saving around \$21,441.40 to \$95,240.08, and is recommended in place with high prevalence to reduce invasive infections and prevent horizontal transmission.³

Epidemiological Aspects of the Event:

To study the *Candida auris* outbreak, screening involved identifying cases through blood, urine, respiratory, and environmental samples. Strict isolation protocols, the use of personal protective equipment (PPE), and adherence to stringent hand hygiene can be implemented to prevent the spread of *C. auris*.⁴ Genetic profiling (whole-genome sequencing/WGS) is important for tracing the epidemiology and spread of *C. auris*, which can distinguish between outbreaks caused by a single strain or multiple introductions and track the evolution of antifungal resistance. Additionally, genome sequencing has revealed multiple strains of *C. auris*, which indicated its emergence in different parts of the world.^{1,5} *C. auris* infections are resistant to major antifungal medications, making them difficult to treat. In the U.S., documented cases rose from 330 in 2018 to 1,471 in 2021, showing a 95% increase from the previous year.⁶ The crude mortality rate for *C. auris*-associated hospitalizations is around 30% to 72%, with invasive infections proving particularly lethal.⁷ The survival rate is low among patients with comorbid conditions or those who are immunocompromised. *C. auris* exhibits high levels of drug resistance, with about 90% of isolates resistant to fluconazole and 30% resistant to amphotericin B.⁸ Potential bias comes from the reluctance of hospitals to disclose information regarding outbreaks.¹ The lack of comprehensive public reporting and the secrecy around outbreak data contribute to an incomplete understanding of the full impact of the pathogen.

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Management of the Event:

Public health stakeholders, such as the Centers for Disease Control and Prevention, have implemented comprehensive measures to manage *Candida auris* outbreaks. These include mandatory pre-admission screening for at-risk patients, isolation protocols for infected individuals, and rigorous environmental cleaning procedures. New York state health officials are also considering implementing new stringent protocols for hospitals and nursing homes to prevent the spread of *C. auris*. Proposed measures involve isolation and ensuring thorough decontamination of healthcare facilities using specialized cleaning equipment.⁹

The protections aim to limit the spread of *C. auris*, but the fungus's high resistance to cleaning agents and antifungal drugs complicates these efforts. Despite rigorous protocols, the persistence of *C. auris* on surfaces and equipment poses ongoing challenges. The cost and time required for screening and decontamination are substantial. Additionally, in-house testing, while cost-effective, is only sometimes available, causing delays in isolation and treatment.³ Moreover, enhanced collaboration among healthcare facilities, public health sectors, and governments is important to address the complexities associated with managing multidrug-resistant pathogens like *C. auris*.

Communications of the Event:

The lack of transparency during outbreaks and the reluctance of hospitals to share information created challenges for accurate epidemiological assessments and public awareness. Many healthcare facilities were hesitant to report *C. auris* cases due to concerns about their reputation and potential public panic. This lack of transparency hindered the ability to track the spread of the fungus accurately and implement timely interventions.¹ Therefore, improved communication strategies, mandatory reporting requirements, and greater transparency are needed to address these issues and enhance the overall management of future outbreaks.

Summary:

The *C. auris* outbreak draws attention to the broader issue of antibiotic and antifungal overuse, which has severe implications for future public health. To combat this, it is important to implement more precise guidelines on antimicrobial prescriptions and management processes, promote the development of new antibiotic treatments, and enhance global surveillance of drug-resistant infections. Future strategies should prioritize antimicrobial usage control and the investment of novel therapeutics to stay ahead of evolving pathogens and ensure a robust defense against future outbreaks.

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