Rising Superbugs- *Candida Auris*: A Case Study

Introduction

First identified in 2009, *Candida auris* is a dangerous hospital acquired, drug-resistant fungus spreading across the globe and landing in the United States in New York, New Jersey, and Illinois[1,2,3,4]. The Centers for Disease Control and Prevention (CDC) has stated that 90% of *C. auris* infections are resistant to one or more drugs while 30% are resistant to two or more; however, there have been cases resistant to all known treatments[1,2,3]. Recent cases have revealed the secrecy and dangers associated with the emerging health threat of drug resistant bacteria and fungal infections[1,2,3,4].

Facts of the Case

In January of 2019, Stephanie Spoor, aged 64, received the news that she had contracted the rare and highly dangerous fungal infection, *C. auris,* while undergoing lupus treatment in Northwestern Memorial Hospital in Chicago, Illinois. This diagnosis prevented her from qualifying for a lung transplant she needed due to her lungs inability to absorb oxygen[1]. The fungal infection was attributed to the insertion of an infected catheter, a common mode of transmission for the hospital acquired infection[1,2]. The fungal spore is notably dangerous because of its ability to spread through the air, stick to surfaces, and avoid disinfection methods including specialized cleaning devices[2,3]. Ms. Spoor is one of nearly 600 reported cases of *C. auris* in the US and 158 cases in Illinois alone[1]. Nearly 50% of Chicago long-term care facility residents have tested positive for the infection, and the numbers are growing[3]. Ms. Spoor, like other patients with *C. auris* infections, had a weakened immune system[2,3,4] that allowed the fungus to perpetrate her bloodstream and ultimately take her life on February 11th, 2019[1]. According to the CDC, almost half of those diagnosed with *C. auris* infections will die within a 90-day time frame[1,2,3]. The cost of drug resistant infections in the United States continues to increase. With two million contracting these infections and 162,000 estimated to die from them annually[3], it's no surprise that the financial cost of resistant fungal infections alone was over $7.2 billion in 2017, specifically $1.4 billion from *Candida* infections alone[5].

Epidemiological Aspects of the Event

The specific infection case of Ms. Spoor was a retrospective observational case study as the main article detailing her illness was written after her passing from details mainly given from the family. The information given was supplemented with observational data of other *C. auris* and other drug resistant infection cases[1]. Potential sources of bias lie mainly in the secondhand accounting of the experience from loved ones close to the infected patient. The authors attempted to address this by reaching out to the hospital and healthcare providers for raw data and first-person professional accounts; however, the hospital declined involvement[1]. This secrecy revolving around the presence of drug resistant microbes is a repetitive response seen in similar studies[1,2,3,4].

Management of the Event

The public health response to Ms. Spoor's specific infection initially was isolation and the use of an extracorporeal membrane oxygenation machine to aid in her breathing as she awaited approval for lung transplantation. Simultaneously, treatment using a "drug cocktail" that had previously been effective against the specific strain in Northwestern Memorial was implemented with little success. Nurses and hospital employees were instructed to implement contact precautions when interacting with the infected patient, limiting visitors, and cross contamination by constantly disinfecting surfaces both inside the room and on their person. It is unclear if these precautions were effective in preventing spread to other patients as the hospital has not

released any statements to the public[1]. Specific management precautions taken after Ms. Spoor's passing are not detailed in the article; however, with similar articles of *C. auris* cases we can deduce the extreme level of cleaning and care the hospital undertook to disinfect the room. It is likely that special cleaning equipment was utilized with extremely strong chemicals along with the replacement of some items in the room to eradicate the fungus[3]. I believe that in eradicating the fungus and preventing the further spread to patients that the hospital was likely very effective in management. Gaps in preparation for such an infection include the existence of preadmission screening for infected patients or carriers who do not show symptoms to the hospital for *C. auris* to isolate patients bringing the fungus in and stop the spread at the source. Additionally, the use of fast screening tests which yield results within an hour may have aided in earlier detection of the fungus preventing the microbe from entering Spoor's bloodstream[2]. The isolation of the patient was a great decision from a public health standpoint; however, it is unclear as to whether that was a response to the patient's infection status or just coincidental.

Communication of the Event

In events surrounding drug resistant infections, hospitals are eerily resistant to comment on their infection status, case numbers, or even progress with eradicating the threat due to fear of public backlash, citing not wanting to cause public panic as a reason for not disclosing outbreaks[2,3,4]. This is the exact response seen with Northwestern Memorial Hospital regarding Ms. Spoor's case as they were not inclined to answer questions regarding her specific case even after being granted permission from her family[1]. I believe the secrecy surrounding bacterial and fungal outbreaks in hospitals is poor management of communications between healthcare facilities/organizations and the public as it can have devastating results for patients who may not need to be exposed (like those undergoing elective surgery[3]). Additionally, regarding *C. auris*, the CDC has it listed as an "urgent threat" often referred to as "the top" threat in resistant pathogens[3]. This description just exemplifies the dangers of this specific infection and thus a prospective patient's right to know whether they face the possibility of contracting it via a certain hospital. I believe the communication aspect of bacterial and fungal infections are so poorly managed due to a financial fear proposed by the hospitals.

Summarize

The infection and untimely death of Ms. Spoor demonstrates the growing threat of drug resistant infections in the public health field. To combat similar losses in the future, it is imperative that we invest in research methods for testing and treatment of new surveillance and antibacterial/antifungal drugs. Finally, communication between the public and healthcare facilities and organizations must improve if we are to protect patients from infection and promote awareness of these threats.

Works Cited

1. Richtel M. How a Chicago woman fell victim to candida auris, a drug-resistant fungus. The New York Times. https://www.nytimes.com/2019/04/17/health/candida-auris-fungus-chicago.html. Published April 17, 2019. Accessed September 20, 2022.
2. Richtel M. To fight deadly candida auris, New York State proposes new tactics. The New York Times. https://www.nytimes.com/2019/05/23/health/candida-auris-hospitals-ny.html. Published May 23, 2019. Accessed September 20, 2022.
3. Richtel M, Jacobs A. A mysterious infection, spanning the globe in a climate of secrecy. The New York Times. https://www.nytimes.com/2019/04/06/health/drug-resistant-candida-auris.html. Published April 6, 2019. Accessed September 20, 2022.
4. Richtel M. Candida auris: The fungus nobody wants to talk about. The New York Times. https://www.nytimes.com/2019/04/08/health/candida-auris-hospitals.html. Published April 8, 2019. Accessed September 20, 2022.
5. Benedict K, Jackson BR, Chiller T, Beer KD. Estimation of direct healthcare costs of fungal diseases in the United States. OUP Academic. https://academic.oup.com/cid/article/68/11/1791/5094714. Published September 10, 2018. Accessed September 20, 2022.