



The re-emergence of Melioidosis in the United States amid COVID-19

Jannel A. Lawrence¹, Arpit Mago^{2✉}, Song Peng Ang³, Manosri Mandadi⁴, Khushman Kaur Bhullar⁵

¹Ross University School of Medicine, Bridgetown, Barbados.

²Jawaharlal Nehru Medical College, Belgaum, Karnataka, India.

³Division of Research & Academic Affairs, Larkin Community Hospital, South Miami, Florida, United States.

⁴Chalmeda Anand Rao Institute of Medical Sciences, Telangana, India.

⁵Sri Guru Ramdas Institute of Medical Sciences & Research, Amritsar, India.

Keywords: *Melioidosis, Tropical Diseases, Infectious Diseases.*

Introduction

Melioidosis is an infectious disease caused by the gram-negative bacterium *Burkholderia Pseudomallei*, an environmental organism predominantly found in water and soil. The disease presents to be a life-threatening global infectious disease affecting both humans and animals. However, direct animal to human and human to human transmission via contact with blood or other bodily fluids is rarely seen. Transmission is via skin inoculation, ingestion, or inhalation, and the incubation period is usually 1 to 21 days, but symptoms can appear in less than 24 hours and months and years after exposure. Complications include pneumonia, bacteremia, septic shock, and abscess formation in many organs (1).

Geographically, Melioidosis is native to tropical climates including Northern Australia, Southeast Asia, China, and India (1). The disease is shown to have a 10-50 percent case-fatality rate and affects roughly 165,000 people worldwide each year globally, with 89,000 (54%) cases resulting in death (2).

The Centers for Disease Control and Prevention (CDC) has classified Melioidosis as a Category B bioweapon, and while the disease is relatively uncommon in the United States (US), most instances have been observed among immigrants and overseas visitors. Since March 2021, there have been three adult and one pediatric case in four different US states (Georgia, Kansas, Minnesota, and Texas) with no associated international travel history. It is unknown whether these patients had other associations related to the disease. Shortness of breath, cough, weakness, weariness, nausea, vomiting, intermittent fever, and a rash over the trunk, abdomen, and face were among the cases' symptoms. The disease was fatal in two cases, and the other two had no known risk for the disease (1). The strains procured from the cases suggest a close match and show that the strain originated from South Asia (3). Despite the fact that the majority of cases of Melioidosis in the US have been imported, there have been two cases, similar to the recent cases in 2021, where the individuals had no prior travel to an endemic country (1).

With the advent of the coronavirus disease 2019 (COVID-19), the potential life-threatening



pandemic has taken up the attention of the entire globe. The pandemic and its sequelae have created a challenge for the health care system in view of allocation and reallocation of resources to tackling other diseases. A reduced number of hospital beds, redeployment of the human and technical workforce during the COVID-19 pandemic have taken a serious toll on detecting and effectively managing many infectious and tropical diseases. Fever, cough, headache, and unexplained weight loss are similar clinical features in COVID-19 and Melioidosis that pose a diagnostic dilemma that calls for renewed attention towards tackling non-covid infectious diseases (4). During the pandemic, infectious diseases that are rare or were once under control may resurface because of a breakdown in public health efforts, a compromised immune system due to infection, and immunodeficiency due to COVID-19 infection which increases susceptibility to other infections.

Since the most recent cases of Melioidosis had no history of travel to endemic areas, the most likely source of infection is an imported commodity, such as food or drink, or a personal care item (3). To find the source of the bacterium, the CDC collected blood and environmental samples from each of the four patients and their houses for laboratory testing. In October 2021 a *B. pseudomallei* strain was found in a scented spray purchased from Walmart and CDC's investigation concluded that the bacterial strain detected in the product matched the strains in all four verified cases (5).

There need to be important preventative, diagnostic, and control measures followed considering the re-emergence of this deadly disease. Active Surveillance and Stringent Import Control Protocols for foreign products must be implemented while increasing the maritime settings' capacity for early risk detection. There is also an adequate need to create a comprehensive approach to promptly supply passengers with critical information to prevent the spread of dangerous diseases. Also, due to the pathogen's bioterror potential, growing awareness of the disease and its impact, research into *B. pseudomallei* is expanding; nevertheless, better diagnostic tests are needed to improve early diagnosis confirmation, allowing for improved therapeutic efficacy and survival. In dealing with this fatal disease, clinicians should consider evaluating Melioidosis in the

case of any acute bacterial infections that do not respond to standard antibiotics, regardless of the patient's travel history (3).

Conclusion

Given the re-emergence of Melioidosis in 2021 in which there was no history of travel to a disease-endemic area, the likelihood of infection is from an imported product. Therefore, clinicians should consider Melioidosis as a differential diagnosis in patients who present with symptoms of the disease. The re-emergence of Melioidosis in the United States at a time when public health efforts are geared towards the control of the COVID-19 pandemic can lead to challenges in tackling this disease. As a result, sufficient monitoring programs, rapid diagnostic procedures, and substantial research endeavors needed to detect and understand *Burkholderia Pseudomallei* are critical.

Declaration of conflicting interests

The authors report no conflicts of interest.

Funding

The authors received no financial support for the study.

References

1. Huhn N. CDC investigates three melioidosis cases in the US [Internet]. *Outbreak Observatory*. *Outbreak Observatory*; 2021 [cited 2021 Oct 27]. Available from: <https://www.outbreakobservatory.org/outbreakthursday-1/7/8/2021/cdc-investigates-three-melioidosis-cases-in-the-us#:~:text=The%20US%20CDC%20is%20coordinating,by%20the%20Burkholderia%20pseudomallei%20bacterium>
2. Tso EYK, Wu AKL, Choi KW, Chan MC, Ting WM. *Tropical Medicine and Infectious Disease* [Internet]. *Mdpi.com*. 2018 [cited 27 October 2021]. Available from:

https://www.mdpi.com/journal/tropicalmed/special_issues/melioidosis

3. Centers for Disease Control and Prevention. Statement on Melioidosis cases [Internet]. 2021 [cited 10 November 2021]. Available from:

<https://www.cdc.gov/media/releases/2021/s0909-melioidosis.html>

4. Centers for Disease Control and Prevention. Melioidosis - chapter 4 - 2020 Yellow Book [Internet]. 2021 [cited 10 November 2021]. Available from:

<https://wwwnc.cdc.gov/travel/yellowbook/2020/travel-related-infectious-diseases/melioidosis>

5. Healio. CDC confirms fatal case of Melioidosis in Georgia, links it to previous US [Internet]. 2021 [cited 10 November 2021]. Available from:

<https://www.healio.com/news/infectious-disease/20210809/cdc-confirms-fatal-case-of-melioidosis-in-georgia-links-it-to-previous-us-cases>