

Presentation Type:

Oral Presentation

Subject Category: Outbreaks

***Mycobacterium abscessus* Surgical Site Infections Due to Modular Cooler-Heater Units in Cardiac Surgery**

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Background: In the spring of 2020, we identified 3 patients with organ-space surgical site infections (SSIs) secondary to *Mycobacterium abscessus* (Table 1). All 3 patients underwent cardiac surgery in the same operating room (OR) during which the CardioQuip Modular Cooler-Heaters (MCHs) were used. We describe key aspects of our cluster investigation, which ultimately led to release of a national safety alert by the Food and Drug Administration (FDA). **Methods:** For environmental cultures, we obtained samples from 9 MCHs in circulation; 2 scrub sink samples; ice from the OR ice machine; water samples from sinks in the cardiovascular critical care unit, and water samples from floors above the cardiac ORs. All samples were sent for molecular genotyping. For pathway studies, an external environmental engineering team was consulted who conducted smoke pathway tests in 3 different ORs. The team also conducted a particle generator experiment, simulating the set-up of a cardiac bypass surgery case. To assess disinfection practices, we reviewed the manufacturer instructions for use (IFU) protocol of the MCHs and audited our own policies and procedures to ensure compliance. **Results:** For environmental cultures, molecular typing from 5 of 9 MCHs and all 3 patient SSI isolates returned positive for the identical hybrid species *M. abscessus bolleti*. All other samples with mycobacterial growth returned with different species. For pathway studies, the particle-generator experiment demonstrated particle movement from the MCH to the sterile field with facilities-guidelines-compliant OR ventilation and despite MCH manufacturing design. For disinfection practices, despite compliance with the stated IFU, and in consultation with experts, we implemented disinfection of associated Quick-connect devices (otherwise not stated in the IFU), and we also initiated a precleaning step prior to disinfection. **Conclusions:** Our investigation concluded that 3 patients developed SSIs with *Mycobacterium abscessus* that was aerosolized from the CardioQuip MCH. This finding led to the national FDA safety report alerting providers to risks associated with the device and the need for continued vigilance around disinfection. In addition, we implemented other control measures including placement of MCHs outside all ORs; creation of a separate MCH fleet for non-OR use; and use of modified disinfection protocols. To date, no additional cases have been identified.

Table 1: Timeline of Cardiac Surgery Surgical Site Infections

	Surgery	Date of surgery	Date of SSI
Patient A	CABG	2/12/2020	4/22/2020
Patient B	CABG	3/20/2020	5/17/2020
Patient C	Aortic dissection repair	3/24/2020	5/9/2020

CABG: Coronary artery bypass graft; SSI: Surgical site infection

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Outbreak of *Pseudomonas aeruginosa* Bacteremia Infections among Stem-Cell Transplant Patients Related to Change in Prophylaxis

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Background: *Pseudomonas aeruginosa* outbreaks can originate from various sources and can cause severe complications in posttransplant patients.

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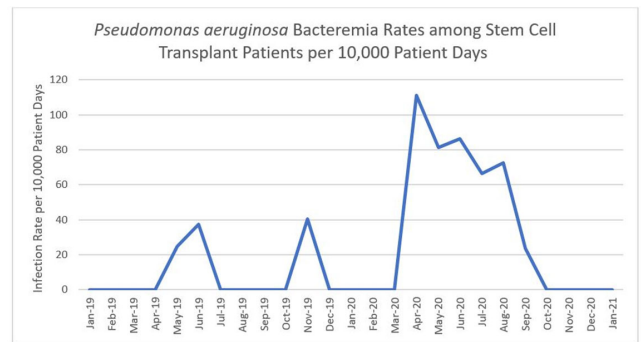


Figure 1. *Pseudomonas aeruginosa* bacteremia rates among stem cell transplant patients per 10,000 patient days.

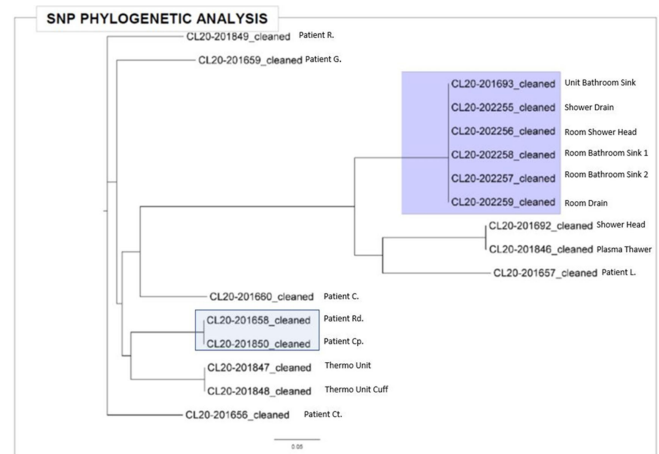


Figure 2. Whole-genome sequencing results, November 2020.

Antibiotic prophylaxis can decrease posttransplant infections; however, consideration must be given to *P. aeruginosa* coverage as we outline an outbreak among the stem-cell transplant (SCT) population. **Methods:** A multidisciplinary outbreak investigation was conducted to evaluate sources of contamination and changes in clinical processes. Positive blood cultures from SCT patients and environmental isolates were analyzed using whole-genome sequencing (WGS). Incidence density rates for *P. aeruginosa* blood cultures from January 2019 through October 2020 were calculated per 10,000 patient days and stratified by unit, specimen, and transplant type. Statistical analysis was calculated with significance at $p < 0.05$. **Results:** A cluster of 8 SCT patients was identified between May and September 2020. Moreover, 10 environmental samples were positive for *P. aeruginosa* including drains, water sources prior to the point-of-use (POU) filter and blood-bank thaw machines. Phylogenetic analysis revealed 1 cluster of 2 patients who shared the same room, 5 patients with unique *P. aeruginosa* isolates, and 2 separate clusters of environmental isolates with relatedness only to each other. Review of clinical processes showed a change from fluoroquinolone prophylaxis to cephalosporin in the spring of 2020. Also, 5 *P. aeruginosa* bacteremia infections occurred prior to June (11.78 cases per 10,000 patient days). During the period of cephalosporin use, 8 infections were identified (58.27 cases per 10,000 patient days) ($P = .006$). Following the restart of fluoroquinolone, zero infections have occurred to date, as of January 28, 2021. **Conclusions:** Discontinuation of fluoroquinolone prophylaxis was associated with *P. aeruginosa* bacteremia infections in SCT patients. Use of fluoroquinolone prophylaxis in SCT patients is protective from *P. aeruginosa* bacteremia infections. There have been no further infections in the following 3 months after the change back to the use of fluoroquinolone. Additionally, WGS showed that most patient