

Cluster Investigation of Environmental Fungal Pathogens & Implementation of Risk Reduction Strategies in an Intensive Care Burn Unit

Zehra Jaffari, MPH; Yvana Rivera Sirtoli, MPH, CIC, HACP-IC; Christie Pinto, MBA, BSN, RN, CPHQ, CPPS; Valerie Ausborn, MPH, CIC
 Memorial Hermann Texas Medical Center | Houston, Texas | USA



BACKGROUND

The mitigation of health care-associated infection (HAI) risks among patients admitted to burn units is crucial through effective infection prevention strategies to ensure safe patient outcomes. These patients are more vulnerable to HAIs than the average patient, given that their absence of skin due to their injuries creates a more accessible route for pathogen entry into the body.

PURPOSE

This study explores sources of a cluster of environmental fungal pathogens isolated from tissue samples among burn patients in an intensive care unit, as well as measures implemented to address the chain of infection.

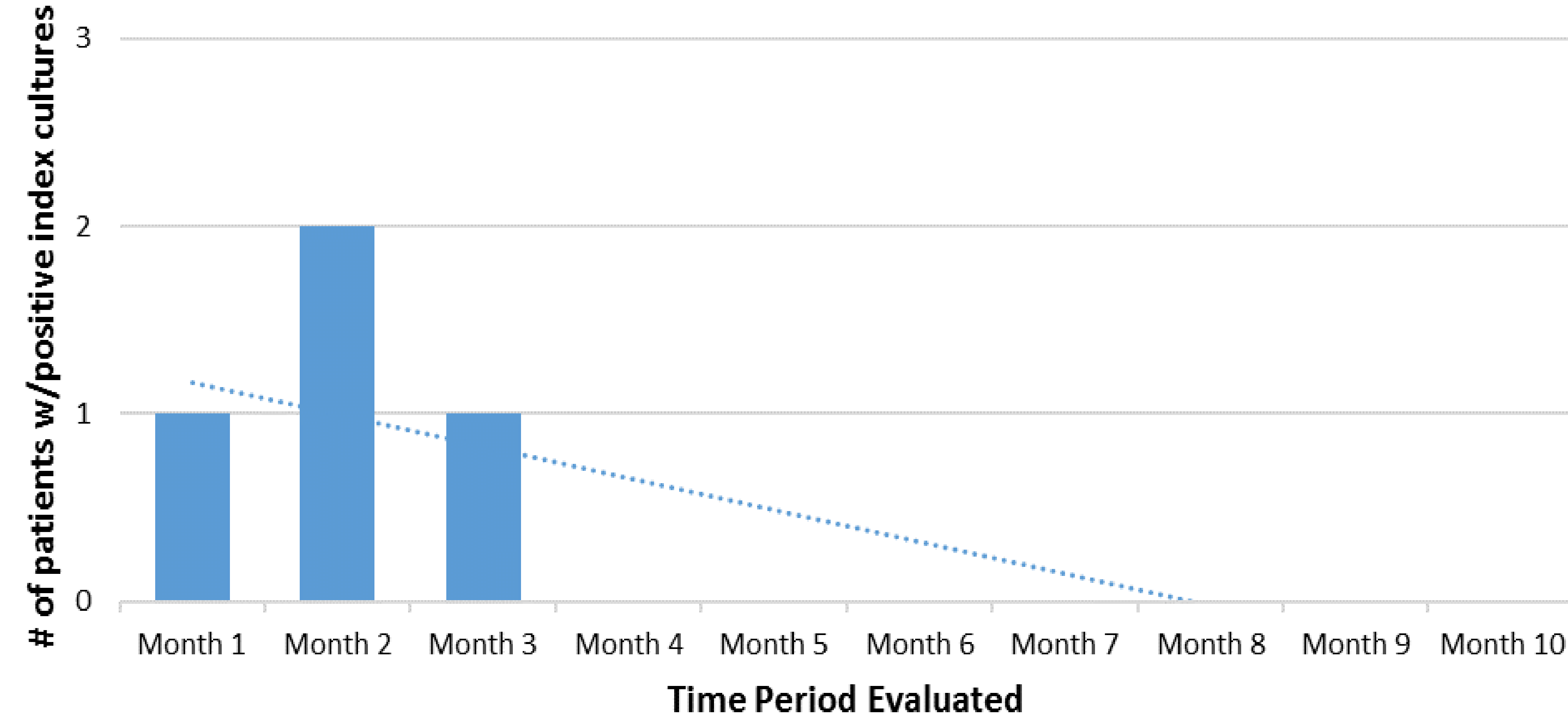
METHODS/DESIGN

Descriptive analysis of patients admitted to a burn unit that underwent a procedure in the specialty burn operating room with positive fungal cultures was completed. Fisher's exact test ($p < 0.05$) was used to evaluate the association between the predictor variable (burn unit rooms), outcome variable (positive fungal tissue culture), and confounding variable (burn operating room). Strategies implemented to reduce infection risk included initiating the use of sterile water for burn debridement, assessment of non-vital equipment in patient rooms, assessment of storage of dressing supplies, and assurance of appropriate ventilation in patient rooms.

RESULTS

A total of four patients had environmental fungal pathogens isolated from tissue specimens, including *Fusarium falciforme*, *Fusarium oxysporum*, *Mucor irregularis*, and *Aspergillus* species. A statistically significant association was observed between specified patient rooms on the burn unit and positive fungal tissue cultures (Fisher's exact test value = 0.0009). After interventions were implemented, no further positive environmental fungal pathogens have been identified.

Patients with Positive Index Cultures



Patient Number	Room Pressure	Environmental Fungal Pathogen	Tissue Culture Collected on Hospital Day	Total Burn Surface Area (TBSA)
1	Negative	<i>Fusarium oxysporum</i> species complex	19	>35% - full thickness burns
2	Negative	<i>Fusarium</i> species	5	>22% - full thickness burns
3	Negative	<i>Mucor irregularis</i> ; <i>Fusarium falciforme</i>	12	>30% - full thickness burns
4	Negative	<i>Aspergillus</i> Species	22	>75% - full and partial thickness burns

ENVIRONMENT OF CARE SOURCES EVALUATED



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CONCLUSIONS

Assessing the environment of care and reviewing unit microbiology are critical to detect sources of airborne transmission of environmental fungal pathogens. This research provides valuable insight into possible environmental vehicles, the importance of appropriate ventilation and water sources for burn patients, and strategies that can be taken to reduce the risk of infection among susceptible patients.

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Questions?
yvana.riverasirtoli@memorialhermann.org
zehra.jaffari@memorialhermann.org

