Effectiveness of Ultraviolet Irradiation on Candida auris: A laboratory Study.

1Jennifer Garmon, MD, 2Dhammika Navarathna, DVM, MS, PhD, 3John Coppin, MPH, 4Marjory Williams, and 5Chetan Jinadatha, MD, MPH,
1Infectious Diseases, Baylor Scott & White Health, Temple, TX, 2Central Texas Veterans Health Care System, Temple, TX,
3Infectious Disease Division, Central Texas Veterans Health Care System, Temple, TX.

INTRODUCTION

Candida auris is a multidrug-resistant yeast which persists on healthcare surfaces for prolonged periods of time and is an emerging pathogen in hospitals. It has been linked to healthcare-associated infection (HAI) through surface transmission. Mobile ultraviolet (UV) light emitting devices from mercury sources have been shown to be effective in reducing C. auris bioburden but require prolonged exposure.

In this study we demonstrate the efficacy of an UV emitting device used in our hospital for terminal disinfection on C. auris.

METHODS

Two C. auris strains (AR-381-CAU-01 & CAU-02) isolates obtained from Centers for Disease Prevention and Control (CDC) were used along with a Candida albicans (C. albicans) strain.

An organism load of 10ul containing 10^6 Colony Forming Unit (CFU) was spread on a 20mm diameter stainless steel coupon and allowed to dry.

These stainless steel coupons were exposed to the UV source from a pulsed xenon device at 5 feet distance and 4 feet height for 5, 10 and 30 minutes.

An unexposed control set was used.

Coupons were placed in sterile conical tubes with PBS and vortex. Each tube diluted by 1/10, plated, and incubated for 72 hours. Plates were counted to determine reductions.

Killing efficacy in terms of log reduction was calculated in comparison to untreated control coupons.

RESULTS

Mean CFU Log_{10} reduction for C. albicans, CAU-02, and CAU-02:
• 5 minutes: 0.547, 1.051, and 0.952
• 10 minutes: 1.412, 1.975, and 1.879
• 30 minutes: 2.639, 3.971, and 4.145

Figure 1 describes the mean log_{10} reduction as well as the minimum and maximum log reduction by isolates.

DISCUSSION

Our study demonstrates the UV from a pulsed xenon device is effective in reducing the C. auris on stainless steel coupons.

Similar to previously published data on reduction of C. auris by other UV sources, extended exposure is required to achieve a higher log reduction of Candida auris.

We did not have any C. auris clinical infections to assess efficacy of UV on HAI reduction.

REFERENCES


ACKNOWLEDGMENTS/DISCLAIMERS

Conflicts of Interest: Dr. Jinadatha has served as PI on research grants sponsored by manufacturer of the UV device (Xenex Disinfection Systems, San Antonio, TX) previously.

Funding: This project was supported by Central Texas Veterans Health Care System (CTVHCS), Temple, TX. The device used in the study is owned and operated by CTVHCS. The manufacturer of device had no role in study design, testing or funding of this study.

Disclaimer: The view(s) expressed herein are those of the authors and do not reflect the official policy or position of the Department of Veterans Affairs or the U.S. Government.