1224. Factors Associated with Aerosolization of Gammaproteobacteria from Intensive Care Unit (ICU) Sinks in a Randomized Trial of Copper Alloy vs. Standard Chrome Sink Drains

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Background. Hospital wastewater environments are recognized as reservoirs for multi-drug-resistant bacteria, and sink drainings in ICUs have been implicated in numerous outbreaks. The mechanism of pathogen transmission to patients, and the best approach to risk mitigation remains unclear. We tested a new copper alloy sink drainage system for its effect on detection of gammaproteobacteria in sink drains and adjacent aerosols.

Methods. We randomized 90 sinks in 76 ICU rooms/bedspaces in 7 ICUs to new standard chrome or copper alloy drains. We sampled sinks on 4 occasions over 4 months. Drain tailpieces were sampled using cotton swabs of 140 cm² of the interior surface, inserted into 1mL of Dey-Engley neutralizing broth, and cultured semi-quantitatively.

Results. Gammaproteobacteria were detected in 247/424 (58%) tailpiece swabs, 137/456 (30%) air samples, and 31/456 (7%) faeces swabs. In multivariable analysis, a growth was less likely from air adjacent to sinks with copper vs. chrome drains ([IRR 0.50 (95% CI 0.35, 0.73), P < 0.001]), with reduced effect size observed when drain growth was included in the model ([IRR 0.64 (95% CI 0.43, 0.94), P = 0.025]). Growth in air was more likely when drain growth was 1–899 cfu/cm² ([IRR 2.38 (95% CI 1.46, 3.88), P = 0.001]) or ≥ 900 cfu/cm² ([IRR 3.55 (95% CI 1.87, 6.86), P < 0.001]) vs. no growth. Tailpiece swab growth was more likely if rooms were occupied compared with empty ([IRR 1.85 (95% CI 1.25, 2.76), P = 0.002]), and less likely from copper drains compared with swabs from chrome drains ([IRR 0.51 (95% CI 0.47, 0.75), P ≤ 0.001]).

Conclusion. Sinks with new copper drains are less likely to have detectable gammaproteobacteria in adjacent air when compared with standard chrome drains, and results suggest this is mediated through reduced bacterial growth in the drains. Ongoing study is needed to determine whether this influences patient risk for hospital-acquired infection.

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1225. How Frequently Should Sink Drains Be Disinfected?

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Background. New evidence shows the relevance of sink drains in the horizontal transmission of multidrug-resistant organisms. We recently demonstrated that a peroxide-based disinfectant (product B) was better than bleach at disinfecting sink drains; however, we did not determine the duration of this effect. In this study, we evaluated the duration of bacterial reduction in sink drains treated with product B and compared it to an enhanced hydrogen peroxide agent (product A).

Methods. Testing was performed in a 26-bed medical intensive care unit at a 566-bed tertiary care hospital in Milwaukee, Wisconsin. Two disinfectants were compared: product A (hydrogen peroxide, octanoic acid, and peroxyacetic acid; Virasept, Ecolab) and product B (hydrogen peroxide-based disinfectant; Peroxide Multi Surface Cleaner and Disinfectant, Ecolab). Sinks were randomly assigned to product A, product B, and control (no disinfection). On day 0, baseline cultures were obtained and disinfectant agents were applied. On post-intervention days 1, 3, 5, and 7, samples from each drain were collected using E-swabs (Copan, Italy). Quantitation of Gram-negative burden was determined by serial dilution in saline plated to MacConkey agar and dilutions that contained 20–200 colonies were used for bacterial colony-forming units (CFU).

Results. All three groups had similar CFU counts at baseline (P > 0.05). On day 1, a statistically significant reduction in bacterial CFUs was observed in the group treated with product A compared with sinks treated with product B (P = 0.04) or the control group (P < 0.01). The same differences were observed on day 3 post-intervention. There were no significant reductions on days 5 and 7.

Conclusion. Product A was the most effective product at disinfecting sink drains but its effect disappeared at 5 days post-disinfection. These results suggest that treating sink drains every 5 days with a hydrogen peroxide mixture would be ideal for healthcare facilities dealing with sink drain contamination.

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