Preventing Waterborne Nosocomial Infections by Using Silver Ions to Reduce Bacterial Contamination in Hospital Showers

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Abstract

Background/Objective: Nosocomial infections pose a serious threat to hospitalized patients. An estimated 100,000 people die each year from infections acquired while undergoing treatment, despite current prevention measures1. One area of concern has been waterborne pathogens in hospital showers2. Bacteria is generally maintained in low concentrations in the water supply. However, stagnant water may reside in shower hoses for hours or days between uses, acting as a reservoir for already present bacteria to reproduce. Without frequent flushing, protective biofilms can develop and potentially harbor opportunistic pathogens3. These biofilms are nearly impossible to remove without replacing the affected parts. To prevent bacterial buildup, silver impregnated shower hoses were placed into patient rooms. The hoses release silver ions, a natural antimicrobial, into the water when the shower is not in use4.

Methods: Four patient rooms were selected for testing. Silver impregnated shower hoses were placed into two rooms. As a control, standard shower hoses replaced existing ones in two other rooms. In each shower, stagnant water was collected initially. The showers were then flushed for two minutes, and another sample was taken. Thirty-two samples were analyzed using serial dilutions and membrane filtration to determine bacterial concentration.

Results: Summarized data can been seen in the results section. A statistically significant difference between silver impregnated and standard shower hoses was not determined. Flushing of water was consistently effective in reducing bacterial levels.

Conclusions: Although the utilization of silver ions to decontaminate shower water showed varying success in the clinical setting, preliminary experiments performed in the lab do emphasize the potential benefits of using silver ions as a decontaminant. Additionally, the data highlight the importance of flushing stagnant water while enhancing the understanding of the hospital environment. As an added precaution, showerheads should be left in the dangling position to drain water after use. Due to its antimicrobial nature, silver impregnation should be further explored as an infection prevention technique.

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References