



KEY POINT SUMMARY

OBJECTIVES

The study aimed at evaluating the effectiveness of a copper-silver ionization system in reducing *Legionella* colonization in the water system and reducing nosocomial legionnaire's disease at a Spain hospital.

DESIGN IMPLICATIONS

The study showed the importance of controlling environmental contamination in water system of hospitals where water transmission of pathogens is a concern. In the design of hospital water system, the selection of proper disinfection systems is important in reducing the risk of the water system becoming reservoirs of pathogens.

Design for preventing one specific infection should be based on a clear understanding of the major route(s) of transmission.

Hospital-Acquired Legionnaires Disease in a University Hospital: Impact of the Copper-Silver Ionization System

Mòdol, J., Sabrià, M., Reynaga, E., Pedro-Botet, M.L.
 2007 | *Clinical Infectious Diseases*
 Volume 44, Issue 2, Pages 263-265

Key Concepts/Context

Legionnaire's disease is an infectious disease caused by inhaling aerosols which can be generated from water sources infected with *Legionella* bacteria. Small invisible water droplets from contaminated water sources may contain the bacteria and remain suspended in the air. Legionnaire's disease can lead to fever, chills, cough, muscle aches, headache, tiredness, pneumonia, and other symptoms.

One major route of legionnaire's disease transmission in healthcare is through contaminated water systems. In this study, through chromosomal subtyping, *Legionella* contamination in the hot water distribution system was identified as the source of a legionnaire's disease outbreak at a Spain hospital. Several disinfection measures were used to reduce water contamination.

Methods

This was a before-after study including two data collection periods. In the first period (lasting 21 months), the hot water system was disinfected using continuous chlorination and heat-and flush methods. At the beginning of the second period (lasting 41 months), a copper-silver ionization system was installed to produce continuous copper and silver ion levels in the water system. Environmental colonization of *Legionella* was periodically measured during both periods through water sampling and analysis. Cases of nosocomial pneumonia were actively monitored. All patients with nosocomial pneumonia were evaluated by physicians for *Legionella* infection based on test results of respiratory, serum, or urinary samples according to CDC criteria. The infect rate was calculated as the number of infection cases per 1,000 patient discharges.



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Findings

After the installation of the copper and silver ionization system, the percentage of water samples tested positive for Legionella was reduced from 57% to 21% and the mean colony count reduced from 11,972 to 758 CFU/L. The infection rate of legionnaire's disease decreased from 2.45 to 0.18 cases per 1,000 patient discharges.

Limitations

There were several limitations of this study:

- In this before-after study, other potential contributing factors might have changed during the study periods which lasted for several years. The article did not mention control of these probably confounding factors such as patient mix and ventilation system.
- The effectiveness of the copper and silver ionization system was demonstrated only on one type of diseases at one hospital. Further research is needed to evaluate whether the findings can be generalized to other diseases and other settings.