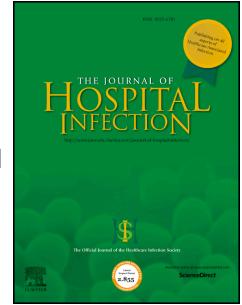


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M.-S. Hsu *et al.*

Efficacy of chlorine dioxide disinfection to non-fermentative Gram-negative bacilli and non-tuberculous mycobacteria in a hospital water system

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SUMMARY

Background: Chlorinated tap water in hospitals often contains low levels of non-fermentative Gram-negative bacilli (NFGNB) and non-tuberculous mycobacteria (NTM). Measures are needed to ensure a safe water supply in hospitals to prevent nosocomial infections from these waterborne pathogens.

Aim: To evaluate the efficacy of ClO₂ treatment of a hospital water system on the levels of NFGNB and NTM in the water.

Methods: Our institution is a 1000-bed medical centre with two main buildings (B1 and B2). B1 has three intensive care units (ICUs) and transplant wards and polyethylene water pipes. B2 (control) has no ICUs and galvanized water pipes. A ClO₂ generating unit was installed in the water system of B1 in 2012 April and water samples were collected in B1 and B2 before and eight times after installation. All samples were cultured for NFGNB and NTM.

Findings: The ClO₂ concentration was significantly lower in the hot water than in the cold water ($P < 0.001$). After 40 weeks of ClO₂ use, the overall NFGNB colonies decreased significantly (hot water: 160 ± 143 vs 2 ± 4 cfu/mL, $P < 0.001$; cold water: 108 ± 138 vs 3 ± 7 cfu/mL, $P < 0.001$). Highly prevalent nosocomial NFGNB, such as *Pseudomonas* spp. and *Stenotrophomonas* spp., were undetected three months after ClO₂ disinfection; *Sphingomonas* spp. persisted but had lower colony counts. NTM was present in 25% (three out of 12) of sampling locations initially, but was not detected at two weeks after ClO₂ disinfection. The ICUs had no overall change in the number of NFGNB nosocomial infections after the intervention.

Conclusion: Addition of a ClO₂ disinfection unit to our hospital water system reduced the

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