



Chlorine Dioxide Safely Prevents Water-Borne Nosocomial Infection

By Deborah Mitchell

WASHINGTON (Reuters Health) Dec 22 - Chlorine dioxide can be safely used to remove Legionella and other water-borne pathogens from a hospital's water supply, researchers reported recently at the 45th Interscience Conference on Antimicrobial Agents and Chemotherapy.

Before disinfection, *L. pneumophila* was detected in 57% of water samples at their hospital. After disinfection, levels dropped to 10% ($p < 0.005$). There have also been no new cases of Legionella-related nosocomial infections.

After tracing three cases of nosocomial Legionnaire's disease to a hospital water supply, Dr. Janet E. Stout of the VA Medical Center in Pittsburgh, Pennsylvania and colleagues used a new technology to reduce colonization of this bacterium.

L. pneumophila pneumonia was diagnosed between March 2001 and January 2002 in two patients at MetroHealth Medical Center in Cleveland, Ohio. Legionella cultures taken from the water system were identical to the bacteria isolated from the patients. Superheating and flushing of the system were undertaken, and the water tank colonized with the bacteria was replaced. However, a third case was diagnosed a short time later.

Because these procedures offer only a temporary solution to the problem, Dr. Stout's group tried a new approach. They used an electrochemical method to generate chlorine dioxide as a disinfectant "in a system that's about the size of a small refrigerator."

Chlorine dioxide is not a new chemical, she pointed out to Reuters Health. "It has been used in the treatment of pulp and paper water - but on the large-scale it has some health and safety issues." High levels of the byproducts of this chemical have been associated with increased risk of miscarriage and, like chlorine, an increased risk of cancer.

"The Environmental Protection Agency sets maximum amounts (of chlorine dioxide) that can be in drinking water. We set out to see if chlorine dioxide used to remove pathogens from the water

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exceed this level - and the answer is no."

The EPA maximum water levels of chlorine dioxide and chlorite are 1.0 mg/L and 0.8 mg/L, respectively. Hospital water samples evaluated every 2 months between June 2004 and November 2005 from 17 sites showed that chloride dioxide levels were well beneath the EPA cut-off, ranging from 0.035 to 0.43 mg/L. The corresponding levels for chlorite were 0.05 and 0.64 mg/L.

A significant reduction in Legionella colonization during this period occurred and no cases of nosocomial Legionnaire's disease were diagnosed, Dr. Stout said. They also observed a reduction in levels of total bacteria after the system was installed.

"This is our third field evaluation - so we're generating information for other hospitals to accurately evaluate whether this is truly going to be something that works for them," she commented.

Nosocomial legionellosis "is basically very widespread across the United States and the world," and it's not just immunocompromised patients who are affected, Dr. Stout added. "The perception is that it's just those really severely compromised individuals, but in fact it's not the case." For example, patients going in for cardiac or other major surgery are also susceptible.

"But now we have another tool to combat it," she concluded.

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