

Research links recreational pool disinfectants to health problems

21 July 2010

Splashing around in a swimming pool on a hot summer day may not be as safe as you think. A recent University of Illinois study links the application of disinfectants in recreational pools to previously published adverse health outcomes such as asthma and bladder cancer.

Each year, 339 million visits take place at pools and water parks across the United States. Not only is swimming fun, but it's also the second most popular form of exercise in the country. Because of this, disinfection of recreational pools is critical to prevent outbreaks of infectious disease.

However, Michael Plewa, U of I professor of genetics, said negative outcomes can occur when disinfection byproducts form reactions with organic matter in pool water.

Pool water represents extreme cases of disinfection that differ from the disinfection of drinking water as pools are continuously exposed to disinfectants.

"All sources of water possess organic matter that comes from decaying leaves, microbes and other dead life forms," Plewa said. "In addition to organic matter and disinfectants, pool waters contain sweat, hair, skin, urine, and consumer products such as cosmetics and sunscreens from swimmers."

These consumer products are often nitrogen-rich, causing concern that they may contribute to the generation of nitrogenous disinfection byproducts, Plewa added. When mixed with disinfectants, these products may become chemically modified and converted into more toxic agents. These disinfection byproducts can mutate genes, induce birth defects, accelerate the aging process, cause respiratory ailments, and even induce cancer after long-term exposures.

In this study, collections from public pools and a

control sample of tap water were evaluated to identify [recreational water](#) conditions that could be harmful to your health.

A systematic mammalian cell genotoxicity analysis was used to compare the water samples. Plewa said this sensitive DNA technology examined genomic damage in mammalian cells, allowing researchers to investigate damage at the level of each nucleus within each cell.

The study compared different disinfection methods and environmental conditions. Results proved that all disinfected pool samples exhibited more genomic DNA damage than the source [tap water](#), Plewa said.

"Care should be taken in selecting disinfectants to treat recreational pool water," Plewa advised. "The data suggest that brominating agents should be avoided as disinfectants of recreational pool water. The best method to treat pool waters is a combination of UV treatment with chlorine as compared to chlorination alone."

Plewa recommends that organic carbon be removed prior to disinfection when the pool water is being recycled.

Also, swimmers can help reduce the genotoxicity of pool water by showering before entering the water. Pool owners should also remind patrons about the potential harm caused by urinating in a pool. These simple steps can greatly reduce the precursors of toxic disinfection byproducts, Plewa said.

More information: This research was published in *Environmental Science & Technology*.

Provided by University of Illinois at Urbana-Champaign

APA citation: Research links recreational pool disinfectants to health problems (2010, July 21) retrieved 20 October 2019 from <https://phys.org/news/2010-07-links-recreational-pool-disinfectants-health.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.