



Exposure to Arsenic Worsens Influenza Virus

Amouzougan EA, Lira R Jr., Klimecki WT. "Chronic exposure to arsenite enhances influenza virus infection in cultured cells." *Journal of Applied Toxicology*. April 4, 2020. Southwest Environmental Health Sciences Center. Summary by Devin Ritter.

Influenza virus is a major threat to public health. This is because we do not have many treatment options, and it is difficult to prevent infections from happening in the first place. This study was conducted to determine the impact that arsenic has on respiratory infections.

Arsenic is found worldwide in drinking water. Because it is so widespread, it is considered one of the most dangerous environmental toxicants. Toxicants are poisons either made by humans or put into the environment because of human activity. Chronic exposure to arsenic by drinking contaminated water shows an increased chance of getting a variety of cancers. It is also known that arsenic causes problems with breathing and respiration. Researchers believe that when epithelial cells in the respiratory tract are exposed to arsenic, viral infections can get stronger. The purpose of this study was to determine if arsenic exposure would make influenza infections stronger.

Epithelial cells in your respiratory tract act as a physical barrier against infections such as influenza. They also secrete antiviral agents that further help prevent infections from happening. It was hypothesized that arsenic would cause issues with these cells for a variety of reasons. First, when lung epithelial cells are damaged, there is a higher chance of contracting a viral infection. This is because epithelial cells are not able to secrete antiviral agents after exposure to toxicants like arsenic. Also, additional research has shown that exposure to arsenic harms proper healing in airway epithelial cells. Finally, arsenic exposure can cause epithelial cells to secrete more mucus than needed. This is bad because the extra mucus blocks the airway and worsens respiratory infections.

Meet the researchers:

Dr. Walter Klimecki

Dr. Klimecki is a human genetics and toxicology researcher at the University of Arizona. He received his doctorate in veterinary medicine in 1984, and his PhD in Pharmacology and Toxicology in 1994. He is currently a member of the Arizona Respiratory Center and the BIO5 Institute.

Study results showed a variety of interesting findings. First, researchers found that arsenic does have the ability to change epithelial cells in your respiratory tract, making them more susceptible to getting infected with influenza. Something that researchers had not anticipated was that arsenic also made Oseltamivir (the main anti-influenza medication) not work as well at fighting off the disease. This decreased effectiveness is worrisome because it raises concerns about the health of arsenic-exposed people who get sick with influenza. It is important to raise awareness about the risks of drinking arsenic-contaminated water so that we can prevent epithelial cell damage and the spread of influenza infections.



Links: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7931812/>

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