Prolonged exposure to extreme heat and humidity increases risk of acute kidney injury

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Hayden Hess, PhD. Credit: Hayden Hess

Exposure to extreme heat (95 degrees Fahrenheit and above) and humidity for eight hours raises the core body temperature and causes dehydration, resulting in an increased risk of acute kidney injury, according to a new study. The researchers, from the Indiana University School of Public Health-Bloomington and University at Buffalo Center for Research and Education in Special Environments in New York, will present their findings virtually at the American Physiological Society's (APS) annual meeting at Experimental Biology 2021.

Acute kidney injury, which is defined as a sudden decline in kidney function, is a major cause of hospitalization during heat waves, especially in vulnerable populations such as older adults and obese individuals. This disorder is expected to worsen as the frequency, intensity and duration of heat waves expand in the U.S. due to climate change, according to study co-author Hayden Hess, Ph.D. As a result, there is concern the public health burden during these extreme hot weather events will be exacerbated.

The study was conducted in a group of adult men who were subjected to a heat- and humidity-controlled environmental chamber. The findings also indicate the risk of acute kidney injury was only evident when environmental conditions outpaced the ability of study participants to maintain core body temperature when cooling and hydrating were not permitted.

Researchers say this information will help lay a foundation for additional studies that improve understanding of the causal mechanisms that lead to a higher risk of acute kidney injury induced by extreme heat exposure. The findings will also be used to develop treatment and prevention measures— such as cooling strategies and hydration recommendations—to reduce the risk of acute kidney injury in vulnerable populations.

More information: Abstract title: "Acute kidney injury risk is exacerbated during prolonged exposure to uncompensable heat"

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