

Physiologists study how athletes respond to icy water conditions

April 6 2016



Credit: Ram Barkai

Hundreds of athletes around the globe are diving into frigid waters to compete in one-mile ice swims. Performance and human physiological response in water this cold—it must be 50 Celsius or less to qualify as an "ice mile" swim, according to the International Ice Swimming Association (IISA)—has not been well-studied to date. Researchers at Winona State University in Minnesota and the IISA analyzed more than 80 ice swimmers in an attempt to understand how age, gender and environmental factors such as wind chill affected performance. They will present their findings today in a poster session at the Experimental Biology 2016 meeting in San Diego.

"It's amazing to see how a 'silly' idea eight years ago has taken off," said Ram Barkai, IISA founder and board chairman. Ice swimming was a demonstration sport at the 2014 Winter Olympics in Sochi, Russia, and

is being considered as a permanent addition to the event line-up in future Winter Olympic games. The IISA records performance times and swimming conditions of athletes who compete in ice swims.

Barkai—himself a Guinness World Record holder for the furthest, most Southern swim (1 km in 1° C in Antarctica in 2008)—said that the IISA data "is getting 'old' daily as new records of endurance are archived." For this study, the research team investigated data from 88 people (71 male, 17 female) who completed ice mile swims.

"Our study of the IISA data set wonderfully describes how much we as humans can ask our bodies to do while in an adverse environment (water that is 50 C or less) and how we can train our minds to accomplish these goals," said Spencer Treu, a member of the research team and first author on the research being presented at Experimental Biology. The team found a slight correlation between age and swim speed: The older the swimmers were, the slower they swam. However, the correlation was modest and suggests that ice swimming could be a sport in which individuals could be competitive in well into their 30s and 40s.

The research team also noted improvement in swim times among those who participated in more than one ice mile. Out of 24 one-mile swimmers who swam two or more swims, 15 were faster on their second swim. Among the eight swimmers who did three or more swims, six improved their speed from their first to third swim. "We also discovered that for one-mile [ice](#) swimmers, wind chill did not greatly affect swim speed. Finally, we discovered that statistically, gender does not influence the effect of age on swim speed," Treu said.

Swimming in such cold water is not without risk, but it is possible to compete safely with the proper training and safety measures in place. "This is a potentially dangerous sport, although in the world of RedBull racers, ironman competitions and the like, perhaps the word 'extreme' is a more appropriate term," Treu noted. "The reason many [swimmers](#) can

successfully complete these swims is most likely due to the intense training and preparation they put themselves through to prepare their bodies and minds."

More information: Treu, an undergraduate student at Winona State University, will present "Human Physiological Performance during a One-Mile Swim in Cold Water" as part of the poster session "Exercise Training Responses" on Tuesday, April 5, from 12:45 to 3 p.m. PDT in Exhibit Halls A-D of the San Diego Convention Center.

Abstract

Human physiological responses to cold water swimming ($\leq 5^{\circ}\text{C}$) are poorly characterized. A database (www.internationaliceswimming.com) describes 1 mile ice swimming performance times and swim conditions. This study analyzed data from 71 male and 17 female persons who completed 1 mile ice swims. Swim completion time was 33.9 ± 6.0 minutes for males and significantly slower for females at 36.2 ± 7.8 minutes. Increased age for females may be associated with a more robust increase in swim times relative to males whose swim times were less detrimentally affected by increasing age. A subset of swimmers completed multiple 1 mile swims ($n=24$), and the second swim time was significantly faster than the first, although improvements were not observed for additional swims. Cold exposure from increasing wind chill has been suggested to have a detrimental effect on cold water swim time, and was associated with an increased swim time that approached significance ($P = 0.06$). Water temperatures below 5°C had no statistically significant effect on swim completion time. In summary, ice swimming is increasing in popularity with consideration for future Winter Olympic activities. Characterization of ice water exposure physiology remains an important consideration for emergency, military, and medical personnel. This data set provides a useful benchmark for understanding and predicting physiological performance during exposure to cold environmental conditions.

Provided by American Physiological Society

Citation: Physiologists study how athletes respond to icy water conditions (2016, April 6)
retrieved 9 April 2024 from
<https://medicalxpress.com/news/2016-04-physiologists-athletes-icy-conditions.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.