

# Study explores role of popular anti-inflammatory drugs on hydration during exercise

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Credit: University of Kansas

Every year, athletes across the country push themselves to their physical limits, often in extremely hot conditions. Increasingly, those same

athletes are taking prescription and over-the-counter drugs to treat the resulting pain and soreness they experience. But very little is known about the effects non-steroidal anti-inflammatory drugs have on dehydration and body temperature, both of which can be closely related to heat stroke.

A University of Kansas study has examined the role popular [drug naproxen](#) plays in hydration and health of athletes.

The study was led by Dawn Emerson, assistant professor of health, sport & exercise sciences at KU in association with researchers at the University of South Carolina. They did not find a statistically significant difference in a number of health factors in volunteers who took naproxen before a workout and those who took a placebo. However, the study did reveal certain physiological trends and is the first step in building a base of knowledge about the role of a category of drugs known as NSAIDs in athletics.

Naproxen, an NSAID that has the over-the-counter name Aleve, is widely prescribed to athletes to treat pain and inflammation. Emerson said she wanted to study the drug as very little is known about its effects in athletes, even though its use is very common.

"There's not a lot of research on naproxen at all," Emerson said. "What's out there on NSAIDs is mostly looking into aspirin, ibuprofen and indomethacin. I wanted to learn more because it's so widely prescribed and to get a better idea of what's going on when people take it in a field setting."

Emerson and fellow researchers recruited volunteers to take a 24-hour dose of Naproxen, 16 hours before, eight hours before and immediately before a 90-minute cycling exercise. The volunteers took either naproxen or a placebo and completed the workout in either an

environment heated to 86 degrees or an ambient setting. They took a battery of measurements among all volunteers, including heart rate, [blood pressure](#), sweat rate, electrolyte balance, weight and body mass. While there were no statistically significant differences among the four groups, the researchers did notice an increase in fluid intake and reduced urine output among the volunteers who took naproxen. That could suggest the drug is related to fluid retention and could be linked to hyponatremia, a kidney condition resulting in low sodium in the blood. Further research is necessary to examine the question, Emerson said.

Previous research has shown that NSAIDs can cause gastrointestinal distress, which is closely linked to heat stroke. What is not known, however, is how different NSAIDs affect people taking them in an athletic setting, although each interacts with the body differently.

"I think this is a place to start pushing for more research in this direction and getting more information on NSAIDs and not just assuming they're all the same," Emerson said. "When you lump all of those together in the research, it's hard to tell the difference in how each reacts. That's why we want to pull them out and look at them closer."

Many assume NSAIDs to be safe, and Emerson said that a relatively healthy person taking a recommended dose and properly hydrating during exercise most likely will not have any problems. However, the lack of knowledge about risk factors that could complicate the drugs' effects is a gap in the research.

In addition, people often take more than the recommended dosage, and adolescents also have easy access to the drugs without supervision.

Emerson said she plans to continue research into NSAIDs, their role in hydration and core temperature, all with the goal of building the knowledge base around the drugs and how they react with people in

athletic settings. Ultimately, she'd like to contribute to the development of recommendations for dosage and use of NSAIDs with athletes based on age, gender, body type, other risk factors and more.

The study found naproxen promoted higher fluid intake in both hot and ambient conditions and higher post-exercise systolic blood pressure in males. Those factors alone suggest medical personnel consider an individual's [risk factors](#) such as renal or cardiovascular conditions, gender and [fluid intake](#) when recommending naproxen use during exercise.

The foundational study is published in the journal *Facets*.

Every year, athletes suffer heat stroke during intense workouts. And with NSAID use at high levels, increasing the understanding of any effects the drugs have in hydration and core temperature can helpfully prevent tragedies such as the deaths of high school athletes and former NFL player Korey Stringer.

"There's a high prevalence of NSAID use in athletes at all levels," Emerson said. "I don't know that that will ever go away. But now that we're starting to learn more about their side effects during exercise, I think it's the right time to research them further and help the medical community understand the risks."

Provided by University of Kansas

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