

Ibuprofen decreases likelihood of altitude sickness, researchers find

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A new study led by Grant Lipman, M.D., an emergency medicine physician at Stanford Hospital & Clinics and a clinical assistant professor at the Stanford University School of Medicine, has found that ibuprofen, a widely available, over-the-counter drug, may help relieve acute mountain sickness, or altitude illness. The study will be published online March 20 in *Annals of Emergency Medicine*.

"A really nasty hangover" is how Grant Lipman, MD, describes the feeling of acute mountain sickness, and for good reason: Symptoms can include headache, fatigue, dizziness, nausea, vomiting and poor appetite.

More than 25 percent of the millions of Americans who travel to high elevations each year, often to hike, camp or ski, will suffer from this condition, also known as altitude illness. But a new study led by Lipman, an emergency [medicine](#) physician at Stanford Hospital & Clinics and a clinical assistant professor at the Stanford University School of Medicine, has found that a widely available, over-the-counter drug may help.

Ibuprofen, an anti-inflammatory medication often used as a painkiller, was found to significantly reduce the incidence of altitude sickness in a double-blind, placebo-controlled trial of 86 men and women, according to the study, which will be published online March 20 in *Annals of [Emergency Medicine](#)*.

The findings could prove especially useful for recreationists who have

weeklong vacations planned at high altitudes. "You don't want to feel horrible for 15 to 20 percent of your vacation," Lipman said. "Ibuprofen could be a way to prevent AMS in a significant number of the tens of millions of people who travel to high altitudes each year."

Acute mountain sickness can do more than just make life miserable: If left unrecognized or untreated, it can lead to high-altitude cerebral edema, an often-fatal swelling of the brain.

For the study, 58 men and 28 women traveled to an area of the White Mountains northeast of Bishop, Calif. They spent the night at 4,100 feet and were given either 600 milligrams of ibuprofen or a placebo at 8 a.m., before heading up the mountain to a staging area at 11,700 feet. There, they were given a second dose at 2 p.m. Then they hiked about 3 miles up to 12,570 feet, where they received a third dose at 8 p.m. before spending the night on the mountain.

Of the 44 participants who received ibuprofen, 19 (43 percent) suffered symptoms of altitude sickness, whereas 29 of the 42 participants (69 percent) receiving placebo had symptoms, according to the study. In other words, ibuprofen reduced the incidence of the illness by 26 percent.

The researchers also observed less severe symptoms overall in those who took the drug compared with those in the placebo group, but the reduction in severity was not statistically significant, based on the self-reporting questionnaire that was used.

At high altitudes, decreased atmospheric pressure means that each breath you take contains fewer oxygen molecules. However, the exact physiological mechanisms that lead to acute mountain sickness are not clearly understood. Some researchers think the condition occurs because a lack of oxygen to the brain causes it to swell with fluids. Ibuprofen

may help to reduce that swelling.

Other medications are available to prevent mountain sickness - specifically, acetazolamide and dexamethasone - but they have downsides. "The safety profile of ibuprofen makes it more attractive than dexamethasone, which has been associated with hyperglycemia, adrenal suppression, delirium, depression, insomnia and mania," the authors note. "Acetazolamide's adverse effects of nausea, dizziness and fatigue are usually well-tolerated but can be as debilitating as acute [mountain sickness](#)."

They add: "We suggest that availability alone makes ibuprofen an appealing drug for individuals who travel to [high altitudes](#). In addition, ibuprofen was effective when taken six hours before ascent, in contrast to acetazolamide, whose recommendations include that it be started the day before travel to high altitude."

The authors say that taking more than 600 mg of [ibuprofen](#) might "provide more robust prevention" but that the theoretical benefits of such a move would have to be weighed against a possibly increased risk of gastrointestinal and kidney problems in people who may be dehydrated.

Provided by Stanford University Medical Center

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