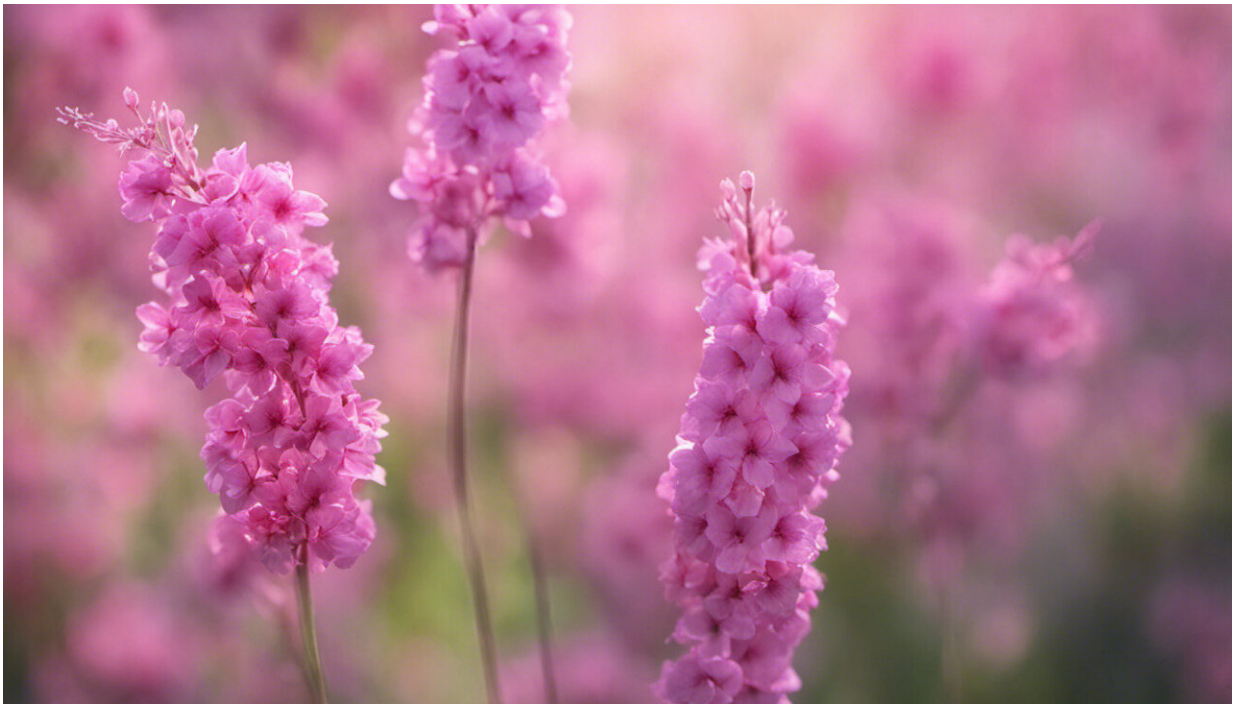


Study could show why heart events increase seasonally

July 2 2020



Credit: AI-generated image ([disclaimer](#))

A growing body of research suggests heart attacks, angina and other heart events increase during winter and summer.

Now, a new study could explain why.

Researchers reviewed an international registry of 1,113 people, the majority from Japan, with [acute coronary syndrome](#). Heart attack is a type of acute coronary syndrome, which occurs when the [blood supply](#) to the heart muscle is suddenly decreased or blocked.

Using images of the fatty deposits in participants' coronary arteries, researchers put people into groups: plaque [rupture](#), plaque erosion and calcified plaque. Each plaque scenario can block [blood](#) flow and lead to a [heart attack](#) or other cardiac event. But a rupture is more immediate and occurs when the calcified plaque breaks off. Erosion can happen over time.

"We looked at those three underlying mechanisms to see whether they were different among the different seasons. As expected, we found a significant difference," said Dr. Ik-Kyung Jang, lead author of the study published July 2 in the *Journal of the American Heart Association*. Jang is an interventional cardiologist and director of the Cardiology Laboratory of Integrated Physiology and Imaging at Massachusetts General Hospital in Boston.

Even after adjusting for age, sex and other [coronary risk factors](#), Jang and his colleagues found that plaque rupture was highest in the winter and lowest in the summer. In people with plaque rupture, the prevalence of [high blood pressure](#) also was higher in the winter. People with plaque erosion or calcified plaque, however, did not tend to have high blood pressure.

One possible explanation for the uptick in wintertime ruptures, Jang said, is that [cold temperatures](#) can lead to constriction or narrowing of the blood vessels, and high blood pressure can be a trigger for plaque rupture. Another potential culprit? "Infection, particularly influenza, can result in systemic inflammation, and since [plaque](#) rupture is also associated with inflammation, that may also contribute to the higher

incidence of acute coronary syndromes in the winter," he said.

Plaque erosion, on the other hand, was higher in the summer. According to Jang, in hot weather, people are more likely to be dehydrated, which concentrates the blood. This can stress the endothelium, a thin layer of cells that line the blood vessels, causing the erosion.

The increase in winter cardiac events holds true even in milder climates, said Dr. Robert Kloner, chief science officer and scientific director of Cardiovascular Research Institute at Huntington Medical Research Institutes in Pasadena, California. He was not involved with the new study.

In a prior study, however, Kloner and his colleagues analyzed deaths from coronary heart disease in Los Angeles County between 1985 and 1996. They reported that the death rates were highest in December and January and lowest in the summer and early fall.

"This is true not only in climates that are known to be cold like the northeast of the U.S., but also in climates that are milder," Kloner said. "People get used to a climate and then when it's even mildly colder, that might be enough to increase cardiac events."

While more research is needed, Kloner said that lifestyle factors also may explain the increase in [plaque rupture](#) during the winter. For example, people tend to eat more fattening, salty foods and overindulge on alcohol during the winter holidays, increasing their risk of heart troubles.

In addition, smoke from fireplaces contributes to greater indoor air pollution, which can contribute to cardiovascular events.

Shoveling snow can increase the [heart's](#) workload, too. "There have been

studies showing associations between snow shoveling and blizzards and an increase in cardiac events," Kloner said.

Jang suggested doctors educate high-risk patients—older people and those with risk factors such as diabetes, obesity, hypertension and high cholesterol—about the risk of cold weather and how they can protect themselves.

"If people take steps to stay warm in the [winter](#) and be hydrated in the summer," Jang said, "we may expect to see less acute coronary syndrome throughout a year."

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