気候変動は心筋梗塞リスクを上昇させる可能性がある (Abstract 18-A-14071-ACC)

心筋梗塞は屋外温度の劇的な変化の後にしばしば増加する

Increase in myocardial infarctions often follows dramatic changes in outdoor temperature

日々の大きな温度変化は心筋梗塞（MI）を有意に増加させたとのスタディ結果が、American College of Cardiology's 67th Annual Scientific Session において3月10日に発表される。MIリスクは温度差が摂氏5度急変する毎に約5% 増加した。摂氏25度を超える温度変化は、摂氏10～25度の温度変化よりもMI率をより上昇させた。一部の気候モデルが地球温暖化と極端な気候イベントとを関連付けていることから、これらの結果は気候変動がMI発症増加に繋がり得ることを示唆している。

Full Text

Large day-to-day swings in temperature were associated with significantly more myocardial infarctions (MI) in a study being presented March 10 at the American College of Cardiology's 67th Annual Scientific Session. Given that some climate models link extreme weather events with global warming, the new findings suggest climate change could, in turn, lead to an uptick in the occurrence of MIs, researchers said.

"Global warming is expected to cause extreme weather events, which may, in turn, result in large day-to-day fluctuations in temperature," said Hedvig Andersson, MD, a cardiology researcher at the University of Michigan and the study's lead author. "Our study suggests that such fluctuations in outdoor temperature could potentially lead to an increased number of heart attacks and affect global cardiac health in the future."

There is a large body of evidence showing that outdoor temperature affects the rate of MIs, with cold weather bringing the highest risk, but most previous studies have focused on overall daily temperatures. This new study is among the first to examine associations with sudden temperature changes.

"While the body has effective systems for responding to changes in temperature, it might be that more rapid and extreme fluctuations create more stress on those systems, which could contribute to health problems," Andersson said, noting that the underlying mechanism for this association remains unknown.

Along with an overall warming trend, climate change is projected to lead to more extreme events, such as heat waves and cold snaps, depending on where someone lives, the researchers explained.

The research is based on data from more than 30,000 patients treated at 45 Michigan hospitals between 2010-2016. All patients had received percutaneous coronary intervention after being diagnosed with ST-elevated myocardial infarction (STEMI).

The researchers calculated the temperature fluctuation preceding each STEMI based on weather records for the hospital's ZIP code. Daily temperature fluctuation was defined as the difference between the highest and lowest temperature recorded on the day of the heart attack.

Overall, the results showed the risk of an MI increased by about 5 percent for every five-degree jump in temperature differential, in degrees Celsius (9 degrees Fahrenheit). Swings of more than 25 degrees Celsius (45 degrees Fahrenheit) were associated with a greater increase in MI rates compared to a smaller increase with temperature swings of 10 to 25 degrees Celsius (18-45 degrees Fahrenheit). The effect was more pronounced on days with a higher average temperature; in other words, a sudden temperature swing seemed to have a greater impact on warmer days. At the far end of the spectrum, on a hot summer day, nearly twice as many MIs were predicted on days with a temperature fluctuation of 35-40 degrees Celsius (63-72 degrees Fahrenheit) than on days with no fluctuation.

"Generally, we think of heart attack risk factors as those that apply to individual patients and we have, consequently, identified lifestyle changes or medications to modify them. Population-level risk factors need a similar approach," said Hitinder Gurm, MD, professor of medicine and associate chief clinical officer at Michigan Medicine and the study's senior author. "Temperature fluctuations are common and [often] predictable. More research is needed to better understand the underlying mechanisms for how temperature fluctuations increase the risk of MIs, which would allow us to perhaps devise a successful prevention approach."

In their analysis, the researchers adjusted for precipitation totals, day of the week and seasonal trends to isolate the effects of daily temperature fluctuations from other potential environmental factors.

Gurm cautioned that the association does not necessarily prove that sudden temperature swings are the cause of the increase in MIs; other factors may have contributed to the results. He noted that it remains important to focus on modifiable cardiovascular risk factors such as smoking, high blood pressure and high cholesterol.

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