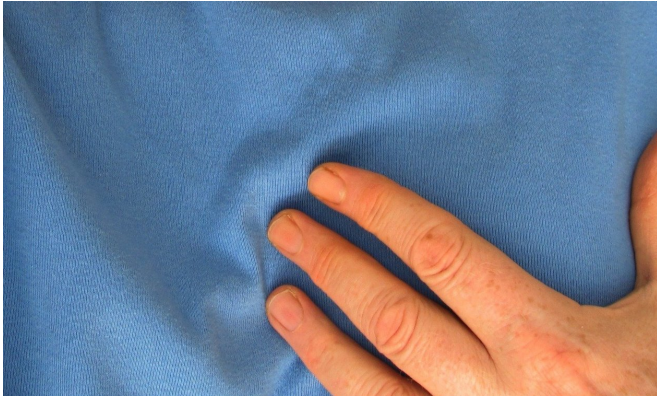


Study indicates age influences sex-related outcomes after heart attack

20 January 2021



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Approximately 1.5 million heart attacks and strokes occur every year in men and women in the U.S. Sex and age play a large part in who experiences a heart attack, the methods used to treat these heart attacks, and the eventual post hospital outcomes of the people who experience heart attacks. Mayo Clinic researchers discuss these sex and age differences in study findings published in *Mayo Clinic Proceedings*.

In this study, Mayo Clinic researchers wanted to see if age was a key factor in sex-related differences in patients with a [heart attack](#). Using public all-payer hospitalization data from the Nationwide Inpatient Sample, the team of researchers evaluated more than 6.7 million hospitalization records for heart attacks. They categorized the information by sex and divided the patients into four age categories: under 45, 45-64, 65-84 and over 84.

To fully compare the treatment given, patients were further categorized by the type of their heart attack. With a STEMI, or ST elevation myocardial infarction heart attack, there is a complete blockage of an artery supplying blood to the heart.

With a NSTEMI, or non-ST elevation myocardial infarction heart attack, there is no ST elevation, but there is typically a significant but partial artery blockage.

The findings show several main points regarding sex and age differences, according to Mohamad Adnan Alkhouli, M.D., an interventional cardiologist at Mayo Clinic and first author of the study.

Women had fewer acute heart attacks than men across all [age groups](#). However, because there are more women than men over 84, more women had heart attacks in that age group. In the NSTEMI and STEMI groups, women had distinctive differences in their risk profiles for heart disease, compared to men. Women were more likely to have hypertension, diabetes, anemia, atrial fibrillation, chronic lung disease and previous stroke. However, women were less likely than men to have had a previous heart attack and less likely to have an implantable defibrillator, a previous revascularization or experience cardiogenic shock.

The data show a clear difference between the sexes for managing a heart attack in the hospital. In the NSTEMI group, women of any age were less likely than men to undergo coronary angiography imaging of the heart's blood vessels, angioplasty to open clogged arteries with a balloon catheter, coronary artery bypass grafting to redirect blood flow, or receive mechanical circulatory support. In the STEMI group, women were also less likely to have coronary angiography or primary angioplasty, or receive mechanical circulatory support. This was true across all age groups.

Compared with men, the data show that worse hospital outcomes among women are confined to those who are younger. In the NSTEMI group, women under 65 were more likely than men to die at the hospital because of their heart attack. This difference in mortality in women versus men also was observed in patients under 85 in the STEMI

group. For both categories of heart attack, younger [women](#) were more likely to have vascular complications and major bleeds, although the same was not true for stroke and [acute kidney injury](#).

"These data suggest that [younger women](#) are particularly at higher risk of major complications after a [heart](#) attack and therefore should be the focus of further research to identify strategies to mitigate this increased risk," says Dr. Alkhoul.

Provided by Mayo Clinic

APA citation: Study indicates age influences sex-related outcomes after heart attack (2021, January 20) retrieved 27 June 2022 from <https://medicalxpress.com/news/2021-01-age-sex-related-outcomes-heart.html>

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