

Less severe first heart attacks linked to heart disease death reductions

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The severity of first heart attacks has dropped significantly in the United States — propelling a decline in coronary heart disease deaths, researchers reported in *Circulation: Journal of the American Heart Association*.

"This landmark study suggests that better prevention and better management in the hospital have contributed to the reduction in deaths," said Merle Myerson, M.D., Ed.D., lead author of the study, cardiologist and director of the Cardiovascular Disease Prevention Program at St. Luke's-Roosevelt Hospital of Columbia University in New York City.

"Better control of risk factors for heart disease, such as blood pressure and cholesterol as well as improvements in hospital management may lessen the severity if somebody has a heart attack," Myerson said. "We also considered whether people had less severity because they got to the hospital sooner, but that was not the case."

The study extends previous findings from the Atherosclerosis Risk in Communities (ARIC), an ongoing epidemiologic study that includes data from four areas — Forsythe County, N.C., including Winston-Salem; Washington County, Md., including Hagerstown; and the suburbs of Minneapolis, Minn. and Jackson, Miss. Both whites and African-Americans were included in the study.

In a previous analysis of ARIC data gathered from 1987 to 1994, researchers found a decrease in many, but not all indicators of severity.

Myerson and colleagues included an extra eight years of data, covering 10,285 patients, ages 35 to 74, who were discharged from the hospital diagnosed with a definite or probable first-time heart attack from Jan. 1, 1987 through Dec. 31, 2002. The new findings show a more consistent picture with a clear decline in severity of heart attacks.

Researchers assessed severity based on patients' electrocardiogram (ECG) findings, the levels of enzymes in the blood associated with heart muscle damage and hemodynamic abnormalities related to blood flow and blood pressure.

Adjusted for age, sex and race, the new findings included:

- A significant drop occurred in the proportion of patients who had major ECG abnormalities, including an average 1.9 percent per year decline in initial ST-segment elevation, a 3.9 percent decline per year for a new (subsequent) Q-wave, and 4.5 percent per year decline for any major Q-wave.
- The average percentage of patients with abnormal biomarkers dropped 0.7 percent, a modest but statistically significant decline.
- Hemodynamic factors (forces involved in blood circulation) showed mixed results. For example, the percentage of patients with cardiogenic shock dropped 5.7 percent per year. But the proportion with systolic blood pressure of 100 mm Hg or less was unchanged, and the percentage with an abnormal pulse rate — less than 60 or more than 100 beats per minute — increased moderately.
- The results for men, women and African Americans paralleled the study's overall results.
- There was some evidence of possible race-related differences between whites and African Americans in new Q-waves and the percent of decline in confirmed heart attacks, which dropped more in whites.
- The percentage of patients who arrived at the hospital in less than two hours after symptom onset remained at approximately 33 percent; there

was no significant change over the study time period.

- These new findings demonstrate that there has been a decrease in heart attack severity and an increased survival among first-time heart attack sufferers; both of which can help to explain the decline in deaths from coronary heart disease.

"The reduction in severity of first-time heart attacks, along with other factors, has impacted on the declining number of deaths from coronary heart disease" Myerson said. "This tells us that better primary prevention as well as better care for those with acute heart attacks is working. Attributing the reduction in severity to specific causes will be an important next step so effective strategies can be reinforced and public health policies can be better directed."

Co-authors are: Sean Coady, M.A.; Herman Taylor, M.D.; Wayne D. Rosamond, Ph.D.; and David C. Goff Jr., M.D. Individual author disclosures are available on the manuscript.

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