

Explaining trends in heart attack

March 11 2009

Explaining trends in heart attack: prevention has improved, mortality rates are down, hospitalisation remains the same

A report in *Circulation* from the Framingham Heart Study, which compared acute [myocardial infarction](#) (AMI) incidence in 9824 men and women over four decades, has proposed an explanation for the apparent paradox of improved prevention, falling [mortality rates](#) but stable rates of hospitalisation.(1) The study found that over the past 40 years rates of AMI diagnosed by ECG decreased by 50%, whereas rates of AMI diagnosed exclusively by infarction biomarkers doubled. This "evolving" diagnosis of AMI, say the investigators, "offers an explanation for the apparently steady national AMI rates in the face of improvements in primary prevention".

However, the investigators emphasise that this study - like others before it - highlights a "40-50%" reduction in heart disease mortality in the USA from 1968 to 2000 and a 50% decline in the incidence of AMI when diagnosed by ECG. This, they propose, "implies that primary prevention efforts have influenced the incidence of AMI". That the incidence of hospitalised AMI has not similarly declined is explained by the greater sensitivity of diagnostic AMI biomarkers; they note, for example, that the detection rate of AMI by troponin was higher than in earlier decades.

Another explanation for the decline in AMI mortality rates may be found in a second report from the same *Circulation* issue.(2) A cohort study of more than 13,000 residents of Worcester, USA, hospitalised

with AMI found that the incidence of cardiogenic shock, the most common complication of AMI associated with fatality, declined throughout the 30-year study period. "The results of our study suggest that patients hospitalized with AMI in the 2000s were less likely to develop cardiogenic shock than greater Worcester residents hospitalized with AMI during earlier study years," the investigators report. Cardiogenic shock results from failure of the ventricles to provide adequate circulation of blood.

Commenting on behalf of the European Society of Cardiology, Professor Frans Van de Werf, Chairman of the Cardiology Department at the University Hospital, Leuven, Belgium, said: "These papers are indeed very helpful for understanding trends reported in recent epidemiological studies of AMI. The data underline the critical importance of the definition of an AMI. The increasing use of very sensitive and specific markers of myocardial necrosis (troponins) and the acceptance of a 'universal definition' of AMI have certainly influenced its detection and reporting. This also explains the increase in reporting of non-ST-elevations AMI.

"The decrease in hospital mortality in patients with cardiogenic shock in the last decade is most likely due to reperfusion therapy, in particular primary angioplasty. An aggressive approach to these patient is recommended in both the US and European guidelines."

More information:

1. Parikh NI, Gona P, Larson MG, et al. Long-term trends in myocardial infarction incidence and case fatality in the National Heart, Lung, and Blood Institute's Framingham Heart Study. *Circulation* 2009; 119: 1203-1210.
2. Goldberg RJ, Spencer FA, Gore JM, et al. Thirty-year trends (1975 to

2005) in the magnitude of, management of, and hospital death rates associated with cardiogenic shock in patients with acute myocardial infarction. A population-based perspective. *Circulation* 2009; 119: 1211-1219.

Source: European Society of Cardiology ([news](#) : [web](#))

Citation: Explaining trends in heart attack (2009, March 11) retrieved 6 May 2024 from <https://medicalxpress.com/news/2009-03-trends-heart.html>

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