Mortality did not vary with sex by 1 year after a first acute myocardial infarction

MacIntyre K, Stewart S, Capewell S, et al. **Gender and survival: a population-based study of 201,114 men and women following a first acute myocardial infarction.** J Am Coll Cardiol. 2001 Sep;38:729-35.

QUESTION

What are the sex differences in immediate (before hospital admission) and 30-day and 1-year mortality after a first acute myocardial infarction (AMI)?

DESIGN

Inception cohort followed for 1 year.

SETTING

Scotland, UK.

PATIENTS

201 114 patients (mean age 70 y, 56% men) with a known first AMI (hospital or death certificate diagnosis) between 1986 and 1995. 58% of the patients survived to be hospitalized.

ASSESSMENT OF PROGNOSTIC FACTORS

Data were collected from each patient's record on age, sex, postal-code sector, date of admission, previous admissions, and date of death (if it occurred) from the Linked Scottish Morbidity Record Database. Postal codes of residence were used to assign a Carstairs deprivation category (rating of socioeconomic status) ranging from 1 (least deprived) to 5 (most deprived). All previous hospital admissions within 5 years were also identified. Associations were assessed by using univariate and multivariate analyses.

MAIN OUTCOME MEASURES

Death after AMI (before hospitalization and at 30 d and 1 y among hospitalized patients).

MAIN RESULTS

Unadjusted rates of death were higher in women than men at 30 days (27.2% vs 18.6%) and at 1 year (38.0% vs 26.7%) ($P < 0.001$ for both comparisons). When the rates of death at 30 days among hospitalized patients were analyzed according to gender and age group, women ≤ 64 years of age had a higher incidence of death than did men in the same age group. Men and women > 65 years of age did not differ for incidence of death at 30 days (Table). Among patients who did not survive to reach the hospital, men had higher rates of death in each age group (Table). In the entire cohort, sex was a significant predictor of death at 30 days: Women were 9% more likely than men to survive to 30 days (95% CI, 7% to 11%, $P < 0.001$). Men and women did not differ for incidence of death at 1 year among hospitalized patients (odds ratio = 0.97, CI 0.93 to 1.01, $P = 0.16$).

CONCLUSIONS

After a first acute myocardial infarction (AMI), men had a greater risk for death than did women among patients who died before hospitalization. This difference offset the greater risk for death noted in women ≤ 64 years of age than in men in the same age group. 1 year after a first AMI, sex was not associated with mortality.

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Incidence of death up to 30 days after a first acute myocardial infarction (AMI)*

Age group	Before hospitalization			30 d after hospitalization			30-d AMI case fatality
	Men	Women	OR (95% CI)†	Men	Women	OR (CI)†	OR (CI)†
< 55 y	20%	19%	0.86 (0.79 to 0.94)	5%	7%	1.25 (1.07 to 1.46)	0.94 (0.87 to 1.01)
55 to 64 y	30%	28%	0.86 (0.81 to 0.90)	11%	13%	1.16 (1.07 to 1.25)	0.93 (0.90 to 0.97)
65 to 74 y	41%	37%	0.82 (0.79 to 0.84)	22%	24%	1.08 (1.03 to 1.14)	0.89 (0.86 to 0.92)
75 to 84 y	55%	50%	0.83 (0.81 to 0.87)	35%	36%	1.00 (0.95 to 1.06)	0.87 (0.84 to 0.91)
> 84 y	68%	67%	0.93 (0.90 to 0.99)	46%	45%	0.98 (0.98 to 1.10)	0.92 (0.85 to 1.00)

*OR = odds ratio.

†Odds ratio adjusted for social economic deprivation and comorbidity with men as the baseline.

COMMENTARY

In the past decade, differences between the sexes in the presentation and treatment of coronary artery disease (CAD) have been noted (1, 2). Smaller body and blood vessel size and increasing age with associated comorbidity were postulated as factors contributing to adverse outcomes in older, postmenopausal women. The study by Vaccarino and colleagues (3) showed a worse outcome in a younger cohort of women hospitalized with MI than in age-matched men.

The study by MacIntyre and colleagues includes outcome differences between men and women who die before hospital admission. The finding that men are less likely to survive until admission clearly affects the sex comparison of hospitalized patients. Taking these early deaths into account, younger women are actually less likely to die at 30 days than men, but as men and women age, this sex difference is reduced and essentially disappears by 75 years of age. When socioeconomic status was adjusted for, the gender effect was further decreased.

This study raises new issues of clinical importance. Although women are slower to reach hospital emergency rooms after the onset of cardiac symptoms, why do more men than women die before reaching the hospital? Why are sex differences in outcome after MI more pronounced in younger than in older persons?

MacIntyre and colleagues have presented a possible explanation for the observation that a younger cohort of hospitalized women have higher-than-expected event rates than do age-matched men, but once again, sex has been shown to be a complex modifier of risk that is related to both age and economic status.

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References

1. **Healy B.** N Engl J Med. 1991;325:274-5.
2. **Weintraub WS, Wenger NK, Kosinski AS, et al.** J Am Coll Cardiol. 1994;24:81-90.
3. **Vaccarino V, Parsons L, Every NR, Barron HV, Krumholz HM.** N Engl J Med. 1999;341:217-25.

