

Smoking increased the risk for death and MI after percutaneous revascularization

Hasdai D, Garratt KN, Grill DE, Lerman A, Holmes DR Jr. **Effect of smoking status on the long-term outcome after successful percutaneous coronary revascularization.** *N Engl J Med.* 1997 Mar 13;336:755-61.

Objective

To determine the long-term effect of smoking in patients who have had percutaneous coronary revascularization.

Design

16-year cohort study.

Setting

Mayo Clinic, Minnesota, United States.

Patients

5450 patients (mean age 64 y, 74% men) who had clinically successful percutaneous coronary revascularization at the Mayo Clinic between 1979 and 1995 and did not have acute myocardial infarction (MI) within 24 hours of the procedure. Clinical success was defined as a reduction of ≥ 20 percentage points in stenosis of ≥ 1 lesion and a residual diameter stenosis of $< 50\%$ without in-hospital complications of death, Q-wave MI, or need for coronary artery bypass graft (CABG). 13 patients who started to smoke during

follow-up were excluded. The mean follow-up was 4.5 years.

Assessment of risk factors

Patients were interviewed 6 and 12 months after revascularization and yearly thereafter. Patients were divided into 4 groups according to their baseline smoking status: nonsmokers ($n = 2009$) were patients who had never smoked, former smokers ($n = 2259$) had stopped smoking ≥ 6 months before revascularization, quitters ($n = 435$) had stopped smoking after revascularization, and persistent smokers ($n = 734$) smoked before and after revascularization.

Main outcome measures

All-cause mortality, Q-wave acute MI or severe angina, and need for CABG or repeat revascularization.

Main results

Multivariate analysis controlled for the following baseline variables: age, sex, severe or unstable angina, previous CABG, previous MI, congestive heart failure, history of diabetes mellitus or hypertension, complete revascularization, multivessel or family history of coronary artery disease, and number of vessels dilated. Persistent smokers had increased risk for death from all causes (relative risk [RR] 1.76, 95% CI 1.37 to

2.26) and for Q-wave MI (RR 2.08, CI 1.16 to 3.72) compared with nonsmokers. The risk for death from cardiac causes was greater in former smokers and persistent smokers than in nonsmokers (RR 1.28, CI 1.04 to 1.58 and RR 1.44, CI 1.04 to 2.04, respectively). Compared with nonsmokers, quitters and persistent smokers had reduced risk for repeat revascularization (RR 0.80, CI 0.64 to 0.98 and RR 0.67, CI 0.56 to 0.81, respectively) and for CABG (RR 0.72, CI 0.54 to 0.95 and RR 0.68, CI 0.54 to 0.86, respectively). Persistent smokers had greater risk for death from any cause than did quitters (RR 1.44, CI 1.02 to 2.11).

Conclusions

Patients who continued to smoke after successful percutaneous coronary revascularization were at greater risk for death from any cause or for Q-wave myocardial infarction than nonsmokers. Stopping smoking after revascularization reduced the risk for death.

Source of funding: No external funding.

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Abstract and Commentary also published in *ACP Journal Club.* 1997;127:52.

Commentary

The study by Hasdai and colleagues provides several important messages. Smokers required coronary angioplasty a full decade earlier than nonsmokers, despite their lower prevalence of hypertension, diabetes, and dyslipidemia. Even after successful angioplasty, persistent smokers had a higher risk for cardiac and all-cause mortality. Although it is clearly best never to have started smoking, quitting smoking after angioplasty is much better than continuing to smoke.

These results enhance existing knowledge about smoking and the risks for coronary artery disease and MI. The conclusions are applicable in a wider context. They strengthen

the arguments for convincing children and adolescents never to start smoking and for encouraging smokers to quit. For patients who have had angioplasty, quitting is a medical necessity. These results from a U.S. setting are consistent with Canadian data (1), further confirming that the lethal effects of tobacco products are not constrained by national borders.

Some may find solace in the result that shows that persistent smokers had reduced rates of revascularization by angioplasty as well as future CABG. Although the explanation for this "smoker's paradox" (2) remains elusive, the observation has no redeeming features, unless one considers it

better to die sooner from MI or lung cancer than to live longer and have repeat angioplasty or CABG. Perhaps those with marketing and public relations responsibilities for tobacco companies will perceive some health economic advantage of this anomaly.

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References

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