Outcomes in Peripheral Arterial Disease Patients Who Undergo Coronary Revascularization with PCI and Stents

Singh M, Lennon RJ, Darbar D, et al. Effect of peripheral arterial disease in patients undergoing percutaneous coronary intervention with intracoronary stents. Mayo Clin Proc 2004;79:1113–8.

Study Overview

Objective. To examine the short- and long-term outcomes of patients with coronary artery disease (CAD) and peripheral arterial disease (PAD) who underwent a percutaneous coronary intervention (PCI) with stent placement as compared with those who underwent the same procedure but had isolated CAD.

Design. Retrospective cohort analysis.

Setting and participants. The Mayo Clinic PTCA registry prospectively collected data on all patients undergoing PCI. 7696 patients who underwent intracoronary stent placement from January 1996 through December 2002 at Mayo Clinic, Rochester, MN, were evaluated. 1397 patients with comorbid PAD (18% of the cohort) were compared with 6299 patients with isolated CAD. PAD was defined as a history of peripheral arterial surgery, the presence of an abdominal aortic aneurysm, disease of the cranial or extracranial arteries including those with a history of stroke or transient ischemic attack, those with a history of carotid disease or a bruit, and those with claudication. All patients underwent PCI with intracoronary stent placement.

Main outcome measures. Outcome measures included in-hospital complications (eg, myocardial infarction [MI], coronary artery bypass grafting, target vessel revascularization, or complication by stroke or transient ischemic attack) and mortality. In addition, patients were contacted by telephone at 6 months, 12 months, and yearly after their procedure and were asked about vital status, MI, and any additional revascularization procedures. Kaplan-Meier survival curves were constructed.

Main results. The success of the PCI procedure was significantly lower in those with PAD (95% versus 97%; $P < 0.001$). In-hospital complications were higher among those with PAD compared with those without PAD in the following: in-hospital death (3% versus 1%; $P < 0.001$), any MI (8% versus 5%; $P < 0.001$), and cerebrovascular accident (0.6% versus 0.3%; $P = 0.02$). After adjustment for other risk factors, the odds ratio for in-hospital death was 1.84 for patients with PAD (95% confidence interval, 1.16–2.90). The Kaplan-Meier estimates of survival free of death, MI, coronary artery bypass grafting, and vessel revascularization for those with PAD was 84% at 6 months, 77% at 1 year, and 69% at 2 years. This was significantly worse compared with those who did not have PAD (89%, 85%, and 80%, respectively; $P < 0.001$).

Conclusion. Compared with patients with isolated CAD, those with PAD had lower procedural success and higher in-hospital complications, including mortality. This increased risk of morbidity and mortality continued for patients with PAD at short- and long-term follow-up.

Commentary

PAD is a common and often ignored patient risk factor. In a recent NHANES study [1], Selvin and Erlinger found that PAD prevalence increases dramatically with age and disproportionately affects blacks. The vast majority of individuals with PAD have 1 or more cardiovascular risk factors that should be targeted for therapy. Other risk factors, including male gender, current smoking, diabetes, hypertension, and hypercholesterolemia, are also positively associated with prevalent PAD.

Singh and colleagues show that the presence of PAD identifies a patient population at risk for both short- and long-term complications when undergoing a PCI with stent placement. The authors found in-hospital mortality rates to be 3 times higher in those with PAD compared with those with isolated CAD. In-hospital MI, stroke, and transient ischemic attack was also higher, and the rates of procedural success were lower. On follow-up, patients with PAD continued to have higher adverse cardiovascular outcomes and increased mortality.

This study is a retrospective analysis of a single center's experience, and this is a central limitation to the study. The authors also note that important secular trends may have occurred given changes in technology that potentially influenced the results. They do report that they included year of

intervention as one of the variables and showed a reduction in the odds of in-hospital death over the time period studied.

Finally, an important limitation of the study is that concomitant use of medical therapy, such as statins, angiotensin-converting enzyme inhibitors, or aspirin therapy, was not studied in either study group at baseline or during follow-up. These medications may have been used preferentially in one of the 2 groups and may have lead to a systematic bias.

Applications for Clinical Practice

The study by Singh et al provides evidence that PAD is highly prevalent (18% in their study population) among those undergoing PCI and intracoronary stenting. Patients with PAD represent an opportunity for providers to treat risk factors that contribute to PAD and CAD and should be targeted for more aggressive therapy.

–Review by Christianne L. Roumie, MD

References

1. Selvin E, Erlinger TP. Prevalence of and risk factors for peripheral arterial disease in the United States: results from the National Health and Nutrition Examination Survey, 1999–2000. Circulation 2004;110:738–43.