

Should we perform PCI in patients with silent myocardial ischemia?

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The SWISSI II randomized controlled trial, recently published by Erne and colleagues [1] focuses on patients without symptoms who had evidence of myocardial ischemia following an acute myocardial infarction. This editorial refers to the effects of percutaneous coronary intervention and silent ischemia after myocardial infarction.

The SWISSI II investigators identified 1057 patients eligible to undergo bicycle exercise testing. Four hundred and eighty of these individuals were excluded after the test for various reasons including no ischemic ST segment changes, angina symptoms, and patient refusal. The remainder of 577 subjects were asked to undergo stress imaging, of which 166 were excluded after the test for "no ischemia", symptomatic ischemia or patient refusal. The remaining 411 patients were asked to undergo coronary angiography, after which 210 were excluded because of triple vessel disease, or refusal to participate, or coronary angiography not amenable to PCI. Thus, the study population that was randomized was 201 patients, 96 to PCI and 105 to anti-ischemic drug therapy. Mean follow-up was approximately 10 years. The primary endpoint of this study was survival free of major adverse cardiac events, defined as cardiac death, non-fatal recurrent myocardial infarction, and/or symptom-driven revascularization (PCI or coronary bypass graft surgery).

Kaplan-Meier survivor function for cardiac death non-fatal myocardial infarction, symptom-driven revascularization revealed a marked difference in event-free survival. Patient randomized to percutaneous coronary intervention clearly did better than those randomized to drug therapy over a ten year period. Anti-ischemic drug therapy consisted of a β -blocker, amlodipine, a calcium antagonist, angiotensin-converting enzyme inhibitors, weight control advice, eating habits advice, smoking cessation advice, daily exercise advice, and aspirin and a statin. However, none of these therapies were protocol driven, but were given at the discretion of the individual primary care physician. Nonetheless, there was not much difference between these therapies in the PCI group vs. the drug therapy group either at four months or at final follow-up.

Although the patients in SWISSI II are a highly selected population, the strength of the study is its long-term follow-up.

In contrast to the SWISSI II randomized controlled trial, the Asymptomatic Cardiac Ischemia Pilot (ACIP) trial, the National Heart, Lung, and Blood Institute sponsored multicentered multinational trial, compared three arms of therapy in 558 patients with coronary artery disease documented by coronary angiography, a positive stress test for myocardial ischemia and ST segment elevation on a 48 hour ambulatory ECG, one episode of which had to be silent [2]. This group of patients was not exactly the same as those in SWISSI II. The three treatment arms were angina guided therapy, ischemia guided therapy, and revascularization therapy. In the ACIP trial, 41% had no history of angina, 48% had no angina during exercise-induced ST segment depression, and 90% had no angina during a 48 hour ambulatory electrocardiogram, in which transient ST segment depression was noted. Only 29% had no angina in their history or during exercise testing, or ambulatory electrocardiography. So, many of these patients had episodes of symptomatic ischemia as well as episodes of asymptomatic ischemia.

The ACIP trial was not powered to assess the endpoints of death, myocardial infarction, or hospitalization for recurrent angina. However, these events were tracked over a two year period. When the combined two year cumulative rates of death, MI, or hospitalization for cardiac disorders were assessed, the rate for angina-guided therapy was 41.8%, for ischemia-guided therapy 38.5%, and for revascularization therapy 23.1%. Thus, revascularization seemed to be the optimal strategy to relieve myocardial ischemia and decrease clinical events given the caveat that much of the medical therapy and PCI in these two trials was not guided by current protocols.

If one combines the data from ACIP and from SWISSI II, it is not unreasonable to conclude that aggressive medical therapy and revascularization benefit patients with silent myocardial ischemia, and the data seem to indicate that revascularization of these patients (PCI and CABG in ACIP, and PCI in SWISSI II) benefit these patients.

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From the Editor

Synopsis: Erne P, Schoenenberger AW, Burckhardt D, et al. Effects of percutaneous coronary interventions in silent ischemia after myocardial infarction: the SWISSI II (Swiss Interventional Study on Silent Ischemia Type II) randomized controlled trial. JAMA. 2007; 297: 1985-1991

In this randomized controlled trial of 201 patients with a recent myocardial infarction, silent myocardial ischemia verified by stress imaging, and 1- or 2-vessel coronary artery disease it has been shown that PCI without stenting compared to intensive anti-ischemic drug therapy (bisoprolol, amlodipine and molsidomine or combination of them) resulted in the risk reduction of major cardiac events (RRR ~55%, NNT ~3), cardiac death (RRR ~80%, NNT ~7) and non-fatal myocardial infarction (RRR ~65%, NNT ~5).

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