Angioplasty versus Medical Treatment for Coronary Artery Disease

Bucher HC, Hengstler P, Schindler C, Guyatt GH. Percutaneous transluminal coronary angioplasty versus medical treatment for non-acute coronary heart disease: meta-analysis of randomised controlled trials. BMJ 2000;321:73–7.

Study Overview

Objective. To determine if percutaneous transluminal coronary angioplasty (PTCA) is superior to medical treatment in nonacute coronary heart disease.

Design. Meta-analysis of randomized controlled trials.

Methods. Only studies that met the following criteria were included: random allocation of patient to treatment; comparison of angioplasty with medical treatment; patients with nonacute coronary heart disease with no acute myocardial infarction for at least 1 week prior to randomization.

Main outcome measures. Coronary artery bypass grafting (CABG), fatal and nonfatal myocardial infarction, angina, angioplasties, and death.

Main results. 429 studies were identified. Only 8 studies were eligible, and 2 of these were excluded because allocation to angioplasty was not random. The meta-analysis was performed on the 6 remaining studies [1–6], which involved 953 patients treated with angioplasty and 951 patients who received medical treatment; follow-up periods ranged from 6 to 57 months. For patients treated with angioplasty compared with medical treatment, the risk ratio was 0.70 for angina (95% confidence interval [CI], 0.50 to 0.98); 1.42 for fatal and nonfatal myocardial infarction (95% CI, 0.90 to 2.25); 1.59 for CABG (95% CI, 1.09 to 2.32); 1.59 for death (95% CI, 1.09 to 2.32); and 1.29 for repeat angioplasty (95% CI, 0.71 to 3.36). The rate of myocardial infarction complicating angioplasty varied from 0.01% to 2.8%. The rate of CABG as a complication of angioplasty varied from 1.5% and 2.8%. One death was reported as a complication of angioplasty.

Medical treatment included antiplatelet agents, β blockers, nitrates, and calcium channel blockers. Few patients received stents, and only one trial included aggressive lipid-lowering therapy.

Conclusion

Angioplasty may lead to a greater reduction in angina compared with medical treatment but also may increase the rate of CABG and is unlikely to reduce rate of nonfatal myocardial infarction, death, or repeated angioplasty.

Commentary

Despite the widespread use of angioplasty, few well-designed studies have compared outcomes of medical therapy and angioplasty. This meta-analysis by Bucher et al examines this issue and provides some very interesting findings. Although angioplasty provides better relief of angina symptoms, it is also associated with the need for revascularization. These results are consistent with previous observational studies of care in the United States and Canada. In Canada, fewer angioplasties were done in the months following myocardial infarction and patients had a higher rate of angina and slightly worse quality of life; however, there were no differences in survival [7,8]

It is important to note that the results of the current study may not be valid because of the changes in the management of coronary disease. We are now routinely using statins for primary and secondary prevention of coronary artery disease, yet only one of the studies reviewed included aggressive lipid-lowering therapy (atorvastatin). Another problem is that the magnitude of the effects of angioplasty varied significantly between studies. Finally, few patients were treated with stents, which along with glycoprotein IIb/IIIa inhibitors are now more widely used. These 2 interventions reduce the risk of rupture and need for bypass surgery. Such shortcomings reinforce the need for more well-designed randomized controlled trials to look at outcomes in nonacute coronary artery events.

Applications for Clinical Practice

Angioplasty may provide better relief of symptoms in stable angina but at the cost of increased revascularizations; therefore, this procedure should probably be reserved for patients who have failed medical therapy.

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