

Stable Coronary Artery Disease – Therapeutic Options and Outcomes

Introduction.

Untreated coronary heart disease (CHD) generally results in progressive angina, myocardial infarction, left ventricular dysfunction, and ultimately death. Recommendations for the treatment of stable angina were largely based upon older clinical trials comparing interventional to medical therapy (MT) and percutaneous coronary intervention (PCI) to coronary artery bypass grafting (CABG). In our study, all patients received optimal medical therapy and most could benefit from drug-eluting stents and internal mammary artery grafting. Given the above, we sought to assess the value of these three different therapeutic approaches in 257 patients with stable coronary artery disease. Primary end points were cardiac death and non fatal myocardial infarction. Secondary end points were quality of life and persistent disabling angina, as well as the need for repeat revascularization and the rate of restenosis in stent. In our follow-up we concentrated on two subgroups: the high risk patients and low risk patients.

Material and method.

This study includes 257 patients with CCS class II-IV stable angina and/or evidence of myocardial ischemia on the resting electrocardiogram or during stress test. All patients underwent coronary arteriography at the Department of Interventional Cardiology of the Institute of Cardiovascular Disease and Transplantation, Târgu Mureș between January 1, 2006 and March 31, 2008. Entry criteria included stenosis of at least 70% in at least one epicardial coronary artery and objective evidence of myocardial ischemia. Exclusion criteria included an ejection fraction of less than 30% and severe comorbidities that affect survival. Patients were then divided in three therapeutic groups, according to the therapeutic approach: CABG, PCI and medical therapy alone. High-risk patients were defined as those with left main (LM) coronary artery disease, proximal left anterior descending artery (ADAp) disease, and multivascular disease with reduced left ventricular ejection fraction (LVEF < 45%). Other patients were considered at low risk. Follow-up period was about 5 years.

Results.

82 patients received medical therapy alone, 91 underwent PCI and 84 underwent CABG. The average age was about 60 years, and most patients were men (75%). High-risk patients have prevailed in the surgical group, while the most non-high risk patients were in the interventional group.

Primary Outcome The primary outcome (a composite of cardiac death and nonfatal myocardial infarction) occurred in 7.69% of patients in the PCI group, 4.76% of patients in the CABG group, and 19.51% of patients in the medical group ($p = 0.04$). Mortality rate was higher in the medical group, but was not statistically significant (12.19% vs 4.39% vs 4.76%, $p = 0.08$). Nonfatal myocardial infarction occurred in 7.13% of patients in the medical group and 3.29% in the PCI group ($p = 0.31$).

Secondary Outcomes At a median follow-up of 5 years, about 94% of patients who underwent CABG, 87% of patients who underwent PCI and 65% of patients medically treated were free of disabling angina ($p < 0.0001$). Among patients who required repeat

coronarography, in stent restenosis occurred in 28% of patients with BMS, and 10.17% with DES ($p = 0.038$). Repeat revascularization was required in both groups, but the difference was statistically significant in favor of CABG (4.7% vs 16%, $p = 0.015$).

Subgroup Analyses Among high-risk patients there was a statistically significant difference in mortality rate between the three groups (21.21% in MT group, 5.12% in PCI group, and 4.54% in CABG group, $p = 0.02$). The primary outcome occurred in 33.33% of patients in the medical group, 7.69% in the PCI group, and 19.51% of patients in the medical group ($p = 0.04$). Among low-risk patients, the primary outcome was 10.2% in the medical group, 5.77% in the PCI group and 5% in the CABG group. The difference was not statistically significant ($p = 0.57$). Also, survival rate was similar in these three approaches (81% vs 94% vs 95%).

DISCUSSIONS

Effects on survival. In overall population, revascularization procedures offered no significant benefits on mortality compared to medical therapy alone in majority of trials. At 5 years, we found no difference in the rate of survival but an increased incidence of nonfatal myocardial infarction in the medical group. This may be due to the fact that high-risk patients have prevailed in the medical group. These patients either did not have a coronary anatomy suitable for bypass grafting, or refused surgery. In high-risk patients, the benefit of revascularization procedures (especially CABG) compared with medical treatment alone is obvious. Low-risk patients had no benefit on survival after revascularization, but the quality of life was improved.

Relief of angina. Rates of angina were consistently lower in the PCI and the CABG groups than in the medical-therapy group during follow-up. Most patients have an improvement or complete relief of angina immediately after CABG. The CASS study performed in the late 1970s and early 1980s showed that more patients remained symptom-free after CABG compared to medical therapy at one and five years. By 10 years, this difference had disappeared. Quality of life was addressed in a separate report from COURAGE trial. There was no significant difference after 36 months. This trial excluded patients with high risk. In our study, in non-high risk subgroup, the difference between these two groups at 5 years is not statistically significant.

Repeat revascularization. In the MASS-II trial, after one-year follow-up, 8.3% of medical treated patients and 13.3% of PCI patients underwent to additional interventions, compared with only 0.5% of CABG patients. In our study, the need for repeat revascularization was significantly higher for patients in the PCI group.

BMS vs DES. Restenosis in stent. The need for repeat target vessel revascularization was markedly reduced with DES over BMS ($p = 0.034$). Instead, the use of DES did not reduce the rate of death or nonfatal myocardial infarction.

CONCLUSIONS. In conclusion, all patients with coronary heart disease should be treated with optimal medical treatment and advised to change their lifestyle. For patients with stable angina that is not significantly interfering with the quality of life and without high-risk characteristics, medical therapy rather than immediate revascularization seems to be the right option. Patients with high-risk criteria will benefit from revascularization regarding their survival rates. DES markedly reduce the rate of restenosis but do not improve outcome.