Meta-analysis of 5-year outcomes of CABG vs PCI with stenting in patients with multivessel disease
Athappan G, Vinodhkumaradihya A, Srinivasan M, Jeyaseelan L, Ponniah T

CRD summary
The authors concluded that there was no survival benefit for coronary artery bypass grafting over percutaneous coronary artery intervention five years after initial procedure. Major adverse cardiovascular events and repeat revascularisation were higher after percutaneous coronary artery intervention. The conclusions reflected the evidence, but without validity assessment and reporting on other review processes the reliability of the conclusions is unclear.

Authors’ objectives
To evaluate the effectiveness of coronary artery bypass grafting (CABG) and percutaneous coronary artery intervention (PCI) with multiple stenting in patients with multivessel coronary artery disease.

Searching
PubMed and Google Scholar were searched from January 1990 to February 2008 for published full articles in English only. Search terms were reported. Reference lists were searched.

Study selection
Randomised controlled trials (RCTs) of coronary artery bypass grafting versus percutaneous coronary artery intervention with stent placement in patients with stable multivessel coronary artery disease were eligible for inclusion. Eligible studies had to have a minimum of five years follow up. Studies with reduced left ventricular ejection fraction were excluded from the review. The primary outcomes of interest were major adverse cardiovascular events, which included composite of death, non-fatal myocardial infarction, target vessel revascularisation or stroke. Secondary outcomes of interest were individual nonfatal Q wave myocardial infarction, target vessel revascularisation and death. Studies included in the review had approximately the same mean age (60 to 62.5 years old) and proportion of male patients (61.3% to 77%). Baseline characteristics such as hypertension, smoking status, diabetes, high cholesterol and previous infarction varied between the studies.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Data was extracted in order to calculate risk ratios and 95% confidence intervals (CI) for each outcome. The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Risk ratios were combined in a meta-analysis using the random-effects model. Heterogeneity was assessed using the Q statistic and the I² test.

Results of the review
Three RCTs (n=2,063 patients) were included in the review. Percutaneous coronary artery intervention was associated with a statistically significant higher risk of major adverse cardiovascular events at five-year follow up compared to coronary artery bypass grafting (risk ratio 2.16, 95% CI: 1.38 to 3.38). There was evidence of statistically significant heterogeneity (I²=87.9%). The authors stated that heterogeneity was decreased by the removal of one study from the analysis (risk ratio 1.72, 95% CI: 1.34 to 2.21), however, the I² value was not reported. Percutaneous coronary artery intervention was also associated with a statistically significant higher risk of repeat revascularisation procedures over a five-year follow up compared to coronary artery bypass grafting (risk ratio 4.47, 95% CI: 2.75 to 7.29). Again, there
was evidence of statistically significant heterogeneity ($I^2=66.6\%$). There were no statistically significant differences between percutaneous coronary artery intervention and coronary artery bypass grafting in terms of mortality at five-year follow up and non-fatal Q wave myocardial infarction.

**Authors’ conclusions**

Five years after initial procedure, there was no survival benefit for coronary artery bypass grafting over percutaneous coronary artery intervention, but major adverse cardiovascular events and repeat revascularisation procedures were high after percutaneous coronary artery intervention.

**CRD commentary**

The review addressed a clear research question and was supported by adequate inclusion criteria. The search strategy was limited to two databases and was subject to language and publication restrictions, so relevant studies might have been missed. The authors did not state whether they assessed the quality of the studies they included in the review, therefore, the reliability of the results of the study could not be determined. Further, they did not report how many reviewers were involved in the review processes of study selection and data extraction, so it was unknown whether or not these review processes were subject to reviewer error or bias. Adequate details of the primary studies were provided and synthesis methods were appropriate. The authors’ conclusions reflected the evidence presented. However, due to the lack of validity assessment and lack of reporting on other review processes, the reliability of their conclusions is unclear.

**Implications of the review for practice and research**

The authors did not state any implications for practice or further research.

**Funding**

Not stated.

**Bibliographic details**


**PubMedID**

18813180

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Angioplasty, Balloon, Coronary; Combined Modality Therapy; Coronary Artery Bypass; Coronary Artery Disease /therapy; Female; Humans; Male; Randomized Controlled Trials as Topic; Stents; Time Factors

**AccessionNumber**

12009101594

**Date bibliographic record published**

06/05/2009

**Date abstract record published**

23/09/2009

**Record Status**

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.