Meta-analysis of early versus deferred revascularization for non-ST-segment elevation acute coronary syndrome
Zhang S, Ge J, Yao K, Qian J

CRD summary
This well-conducted review concluded that early revascularisation was not better than deferred revascularisation in the prevention of all-cause death and myocardial infarction in patients with non-ST-segment elevation acute coronary syndrome. Early revascularisation significantly reduced refractory ischaemia (untreatable blood flow obstructions). These findings are likely to be reliable, although based on few trials.

Authors' objectives
To compare the impact of early versus deferred revascularisation strategies for the treatment of non-ST-segment elevation acute coronary syndrome.

Searching
Medline, Web of Science, the Cochrane Database of Systematic Reviews and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched up to July 2010. Citations were searched on the Web of Science using cross references from eligible studies. There were no language limitations. Search terms were reported.

Study selection
Randomised controlled trials (RCTs) that assigned patients with non-ST-segment elevation acute coronary syndrome to early or deferred coronary revascularisation were eligible for inclusion. Interventions could include percutaneous coronary intervention or coronary artery bypass grafting. Early intervention was defined as coronary revascularisation soon after admission and randomisation; deferred intervention was defined as pre-treatment using standard medical therapy and subsequent revascularisation in later stages after enrolment.

The average age of participants was 62 to 70 years; about two thirds were male. Most participants received a percutaneous coronary intervention. Interventions were conducted before and after the drug-eluting stent era. Early coronary revascularisation took place from 0.5 to 16 hours after randomisation; deferred interventions took place from 21 to 86 hours after randomisation. The difference in time to intervention between the two strategies ranged from 19.7 to 83.6 hours.

Two authors selected studies for inclusion in duplicate. Disagreements were resolved by consensus.

Assessment of study quality
Methodological quality of included trials was assessed using the Jadad 5-point scale which covered randomisation, blinding, and withdrawals and drop-outs.

The authors did not state how many reviewers conducted the quality assessment.

Data extraction
Major clinical outcomes (all-cause death, recurrent myocardial infarction, refractory ischaemia, repeat intervention, and major bleeding events) were extracted to calculate risk ratios (RRs) and 95% confidence intervals (CIs).

Data were extracted by two reviewers independently. Disagreements were resolved by consensus or by a third reviewer as needed.

Methods of synthesis
Pooled risk ratios and 95% confident intervals were calculated using a fixed-effect model. Heterogeneity was assessed using I².

Subgroup analyses were conducted to assess the effect of different intervention era, extent of revascularisation, and absolute differences in intervention time on clinical outcomes.
Publication bias was assessed using the Egger and Begg tests.

Results of the review
Five RCTs, with 4,155 patients (range 142 to 3,031), were included in the review. The quality of the trials was considered high. All trials reported outcomes at 30 days; two trials followed patients up to six months.

There was no significant difference in mortality risk between early and deferred revascularisation at 30 days (RR 0.88, 95% CI 0.61 to 1.26; five trials; 4,155 patients) or at six months (RR 0.82, 95% CI 0.61 to 1.10; two trials; 3,173 patients).

The incidence of recurrent myocardial infarction was not statistically different between the two strategies at 30 days (RR 0.92, 95% CI 0.70 to 1.22; five trials; 4,155 patients) or at six months (RR 0.83, 95% CI 0.61 to 1.12; two trials; 3,173 patients). Heterogeneity was very low (I² ranged from 0 to 28%).

Early revascularisation was found to significantly lower the risk of refractory ischaemia by approximately half (RR 0.47, 95% CI 0.32 to 0.68; two trials; 3,383 patients) compared with deferred revascularisation (follow-up duration not reported).

There was a non significant trend for a decreased risk of major bleeding with early revascularisation (RR 0.77, 95% CI 0.57 to 1.03; five trials; 4,155 patients).

The risk of repeat revascularisation was significantly higher for the early revascularisation group at 30 days (RR 1.34, 95% CI 1.00 to 1.81; three trials; 3,525 patients), but not at six months.

Results of subgroup analyses were presented. There was no evidence of significant publication bias.

Authors’ conclusions
Early revascularisation was not superior to deferred revascularisation for the prevention of all-cause death; the timing had little impact on myocardial infarction in patients with non-ST-segment elevation acute coronary syndrome. Early revascularisation significantly decreased the incidence of refractory ischaemia and appeared to reduce the risk of major bleeding. An increase in repeat revascularisation was observed in patients receiving early revascularisation one month after the intervention, but the difference disappeared at six months.

CRD commentary
The review question and inclusion criteria were clear. The literature search was adequate. Study selection and data extraction were conducted with sufficient attempts to minimise error an bias, although it was unclear if this was the case for quality assessment.

The results of the quality assessment of included trials were reported; this was taken into account in the interpretation of the results. Trial and patients details were adequately provided. Few trials were included in the review. One large trial, which included most of the patients significantly influenced the direction and size of the pooled estimates. However, trials were of good quality and reported largely consistent results. Follow-up duration was limited, which meant that the long-term impact of the respective interventions was unclear.

The findings of this well-conducted review are likely to be reliable. However, the small number of trials should be borne in mind.

Implications of the review for practice and research
Practice: The authors stated that for high-risk patients (Global Registry of Acute Coronary Events risk score over 140), urgent coronary revascularisation should be performed within 24 hours of hospital admission.

Research: The authors did not state any implications for future research.

Funding
Research Fund for the Doctoral Program of Higher Education, China; Youth Science Funds of the Shanghai Municipal Health Bureau, China; Youth Science Funds of the Fudan University, Shanghai Medical College, China; Key Projects
in the National Science and Technology Pillar Program in the 11th 5-Year Plan Period, China; Outstanding Youth Grant from the National Natural Science Foundation of China.

**Bibliographic details**

**PubMedID**
21872193

**DOI**
10.1016/j.amjcard.2011.06.035

**Original Paper URL**
http://www.ajconline.org/article/S0002-9149(11)02227-2/abstract

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Acute Coronary Syndrome /mortality /therapy; Hemorrhage /prevention & control; Humans; Myocardial Revascularization; Randomized Controlled Trials as Topic; Secondary Prevention; Survival Analysis; Time Factors

**AccessionNumber**
12011006696

**Date bibliographic record published**
26/03/2012

**Date abstract record published**
16/07/2012

**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.