Increased late mortality with percutaneous stenting for unprotected left main coronary artery stenosis relative to coronary artery bypass grafting: a meta-analysis of observational studies

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CRD summary
The authors concluded that percutaneous coronary stenting may increase late mortality (two- to four-year) by 35% compared with coronary artery bypass grafting in patients with unprotected left main coronary artery stenosis. Given the poor reporting of the review process and reliance on non randomised studies of uncertain quality, these conclusions should be interpreted with caution.

Authors’ objectives
To compare percutaneous coronary stenting with coronary artery bypass grafting for the prevention of late mortality in patients with unprotected left main coronary artery stenosis.

Searching
MEDLINE, EMBASE and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched to December 2009; search terms were not reported. Reference lists of identified articles, reviews and commentaries were manually searched.

Study selection
Comparative studies of percutaneous coronary stenting versus coronary artery bypass grafting that enrolled patients with unprotected left main coronary artery stenosis were eligible for inclusion. Eligible studies had to provide adjusted hazard ratios (HRs) for mortality with at least one year of follow-up. Studies from which hazard ratios or risk estimates could not be extracted were excluded. The main outcomes were adjusted hazard ratios for mortality with at least one year of follow-up.

In included studies, the proportion of drug-eluting stents in the percutaneous coronary stenting group ranged from 41 to 100%; the proportion of off-pump coronary bypass in the coronary artery bypass grafting group ranged from 0 to 52% (where reported).

The authors did not state how many reviewers selected studies for inclusion.

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

Data extraction
Adjusted hazard ratios, along with 95% confidence intervals (CIs), were extracted for mortality with at least one year follow-up.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Hazard ratios and 95% confidence intervals were pooled using a fixed-effect model; a random-effects model was used if significant heterogeneity was present. Heterogeneity was assessed using the $X^2$ test and $I^2$ statistic.

Meta-regression analyses were used to explore sources of heterogeneity; these considered the proportion of patients receiving drug-eluting stents and those undergoing off-pump coronary artery bypass.

Publication bias was assessed using an adjusted rank correlation test.
Results of the review
Seven non randomised studies were included in the review (n=2,841 patients, range 270 to 1,084). Duration of follow-up ranged from two to three years.

There was a significant increase in mortality for percutaneous coronary stenting compared with coronary artery bypass grafting (HR 1.35, 95% CI 1.04 to 1.75; I²=42%; seven studies).

The percentage of patients that underwent off-pump coronary artery bypass grafting was significantly associated with impaired coronary artery bypass grafting treatment estimates.

There was no evidence of publication bias.

Authors' conclusions
Percutaneous coronary stenting may increase late (two- to four-year) mortality by 35% compared with coronary artery bypass grafting in patients with unprotected left main coronary artery stenosis.

CRD commentary
The review question and inclusion criteria were clear. Limited study details were provided. Relevant databases were searched and reference lists were reviewed. It was unclear whether language restrictions were applied and there was no indication that unpublished material was sought; language bias may have been present and some studies may have been missed. Publication bias was assessed and considered likely to be absent. It was unclear whether study selection and data extraction were carried out with sufficient attempts to minimise error and bias.

The absence of any formal quality assessment of included trials limited interpretation of the reliability of the findings. The chosen methods of synthesis appeared to be appropriate. Suitable methods were used to assess and explore heterogeneity.

The authors’ conclusions reflected the results of the review, but the poor reporting of the review process and reliance on non randomised studies of uncertain quality, mean that they should be interpreted with caution.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that results from large randomised controlled trials are required.

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Bibliographic details

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Linked records
- Stenting versus coronary artery bypass grafting for unprotected left main coronary artery disease: a meta-analysis of comparative studies