A comparison of drug-eluting stents versus bare metal stents in saphenous vein graft PCI outcomes: a meta-analysis


CRD summary
This review found that drug-eluting stent use in saphenous vein graft percutaneous coronary intervention was associated with reduced mortality and reduced risk of adverse cardiac events. These conclusions are supported by observational studies but should be interpreted with some caution because randomised controlled trials found no association, relevant studies may have been missed and study quality was not formally assessed.

Authors' objectives
To compare bare-metal stents with drug-eluting stents in the treatment of saphenous vein graft lesions.

Searching
MEDLINE was searched from 1996 to December 2009. Conference proceedings from four relevant organisations were screened from 2004 to 2009. Reference lists and review articles were screened.

Study selection
Eligible randomised controlled trials (RCTs) and observational studies assessed the impact of drug-eluting stents and bare-metal stents on a formally assessed endpoint of mortality in patients who had saphenous vein graft percutaneous intervention. Studies had to include at least six months follow-up. Mortality was the primary outcome. Secondary outcomes included major adverse cardiac events, myocardial infarction, stent thrombosis, target vessel revascularisation and target lesion revascularisation.

Drug-eluting stents used were CYPHER, Endeavour, Promus, Sirolimus eluting and Taxus.

The authors did not state how studies were selected for inclusion.

Assessment of study quality
A formal quality assessment was not reported.

Data extraction
Data were extracted to calculate odd ratios (ORs) with 95% confidence intervals (CIs). Where studies reported results for multiple time points, data on the longest follow-up were extracted.

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

Methods of synthesis
Summary odd ratios and 95% confidence intervals were estimated using a random-effects model. Heterogeneity was assessed using Q and I². Data were pooled for all study designs combined and stratified according to study design. Meta-regression analysis was used to assess the influence of length of follow-up.

Results of the review
Twenty studies (5,296 participants) were included; two RCTs (165 participants) and 18 registry studies. Mean follow-up ranged from six to 48 months (mean 23 months). Baseline characteristics were similar between groups in all studies.

Mortality rates ranged from 0% to 28.9% in the drug-eluting stents group and from 0% to 29.2% in the bare-metal stents group. The use of drug-eluting stents was associated with a decreased risk of mortality compared with bare-metal stents in patients undergoing percutaneous intervention for saphenous vein graft (OR 0.68, 95% CI 0.53 to 0.88; 20 studies). There was little evidence of heterogeneity (p=0.14; I²=26.3%). There was no association between length of follow-up and mortality outcomes. Restriction of the analysis to RCTs showed no association with drug-eluting stents use and mortality (OR 6.7, 95% CI 0.62 to 74.14; two RCTs).
The use of drug-eluting stents was associated with a reduced risk of major adverse coronary events (OR 0.64, 95% CI 0.51 to 0.82; 19 studies), target vessel revascularisation (OR 0.57, 95% CI 0.41 to 0.80; 16 studies) and target lesion revascularisation (OR 0.60, 95% CI 0.43 to 0.83; 13 studies). There was strong evidence of heterogeneity (p<0.001; I²=62.4%) for the major adverse coronary events studies; heterogeneity was not reported for target vessel revascularisation or target lesion revascularisation.

Restriction of the analysis to the RCTs showed no association with drug-eluting stents use and major adverse coronary events (OR 1.10, 95% CI 0.34 to 3.57; two RCTs). There was no association between drug-eluting stents use and myocardial infarction (16 studies) or stent thrombosis (eight studies).

Authors' conclusions
Drug-eluting stents use was safe in saphenous vein graft percutaneous coronary intervention and was associated with reduced mortality and major adverse coronary events rates associated with reductions in revascularisation.

CRD commentary
The review addressed a focused question and inclusion criteria were defined. The literature search only involved one database and, although conference abstracts were screened, specific attempts were not made to locate unpublished studies; so there was a possibility of publication bias and relevant studies may have been missed Details of the review process were not reported so it was unclear whether appropriate steps were taken to minimise bias and errors.

Study quality was not formally assessed and only limited details on the studies were reported, so the risk of bias and generalisability of the included studies was unclear. Appropriate methods were used to pool data (which included restriction of the analysis to the RCTs) but heterogeneity was not fully investigated.

The authors conclusions are supported by the data from observational studies but should be interpreted with some caution because RCTs did not support these findings, some relevant studies may have been missed by the searches, heterogeneity was not investigated and the risk of bias in the included studies was not considered.

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

Research: The authors stated that there was a need for large RCTs using newer generation drug-eluting stents platforms to clarify the role of drug-eluting stents in saphenous vein graft percutaneous coronary intervention.

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