Efficacy and tolerability of nonpenetrating glaucoma surgery augmented with mitomycin C in treatment of open-angle glaucoma: a meta-analysis

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CRD summary
This review concluded that non-penetrating glaucoma surgery augmented with mitomycin C was as effective as trabeculectomy plus mitomycin C in lowering intraocular pressure in open-angle glaucoma and was better tolerated. Given the small sample size and absence of randomisation in some included studies, along with uncertainty about study quality, the reliability of this conclusion is unclear.

Authors’ objectives
To evaluate the efficacy and tolerability of non-penetrating glaucoma surgery augmented with mitomycin C compared with trabeculectomy plus mitomycin C in treating open-angle glaucoma.

Searching
MEDLINE, EMBASE, the Chinese Biomedicine Database and the Cochrane Library were searched from 1966 to April 2008. The Internet, manufacturers’ databases and reference lists from relevant articles were also searched. Search terms were reported. Published and unpublished studies were included in the review.

Study selection
Controlled clinical trials comparing non-penetrating glaucoma surgery augmented with mitomycin C versus trabeculectomy plus mitomycin C, for treatment of patients with primary or secondary open-angle glaucoma not responding to maximal medical therapy, were eligible for inclusion. To be eligible, at least one of the following outcomes had to be reported: preoperative to postoperative intraocular pressure reduction; complete success rate defined as proportion of patients, with an end point intraocular pressure less than 22mmHg without anti-glaucoma medication; and the probability of qualified success of end point intraocular pressure less than 22mmHg with or without anti-glaucoma medications. Cohort studies and randomised trials were included.

Two reviewers independently selected the included studies and this was checked by a third reviewer.

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

Data extraction
Data were extracted to enable the calculation of relative risks for dichotomous outcomes and weighted mean differences for continuous outcomes and the associated 95% confidence intervals were presented. When data on a particular outcome was not reported, they were computed by the authors. The calculations were based on intention-to-treat data.

Two reviewers independently extracted the data with any disagreements resolved by consensus.

Methods of synthesis
Study-specific effect estimates were combined using a random-effects meta-analysis. The influence of methodological characteristics of studies on the pooled estimates was assessed by sensitivity analyses. Heterogeneity was assessed using \( \chi^2 \) test.

Results of the review
Eight studies (n=459 eyes) were included in the review. Four were randomised controlled trials. Four were cohort studies. The number of patients in each arm ranged from 10 to 53. The mean follow-up ranged from 12 to 48 months.
The proportion of patients achieving the end point intraocular pressure target of less than 22mmHg without anti-glaucoma medication was significantly higher in patients undergoing trabeculectomy plus mitomycin C (pooled relative risk 0.74, 95% CI 0.63 to 0.86; five studies). However, non-penetrating glaucoma surgery augmented with mitomycin C was associated with significantly lower complication rates of shallow anterior chamber (pooled relative risk 0.31, 95% CI 0.16 to 0.60; six studies) and cataract (pooled relative risk 0.23, 95% CI 0.11 to 0.47; three studies). No statistically significant heterogeneity was found. Hypotony, hyphaema and choroidal detachment rates were also low in this group, although not statistically significant.

The intraocular pressure reduction in patients undergoing non-penetrating glaucoma surgery augmented with mitomycin C was similar to patients treated by trabeculectomy plus mitomycin C at one, two, three and four year follow-up. The qualified success rates were not significantly different between the two treatments.

**Authors' conclusions**
Non-penetrating glaucoma surgery augmented with mitomycin C was comparable to trabeculectomy plus mitomycin C in lowering intraocular pressure in open-angle glaucoma. Trabeculectomy was more successful in achieving target intraocular pressure without anti-glaucoma medication. Non-penetrating glaucoma surgery was better tolerated, with fewer postoperative complications.

**CRD commentary**
The review addressed a clear research question supported by well defined inclusion criteria. The search strategy included several sources, with additional attempts made to identify unpublished studies, which minimised the publication bias. The authors did not formally assess publication bias. Steps were taken to minimise biases and errors during the review process by independent and duplicate study selection and data extraction.

Study validity was not assessed, and this limited the interpretation of reliability of the review findings. The methods used for synthesis appeared to be appropriate.

The authors' conclusions are supported by data presented. However, given the small sample size of some included studies and the lack of validity assessment, the reliability of these conclusions is unclear.

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

**Research:** The authors stated that large, longer-term (at least five years) multi-centre randomised controlled trials are required to evaluate the efficacy of non-penetrating glaucoma surgery augmented with mitomycin C, especially in achieving an intraocular pressure target without anti-glaucoma medication.

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