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Non-penetrating filtration surgery versus trabeculectomy for open-angle glaucoma (Review) Copyright © 2014 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd. [Intervention Review]

Non-penetrating filtration surgery versus trabeculectomy for openangle glaucoma

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ABSTRACT

Background

Glaucoma is the second commonest cause of blindness worldwide. Non-penetrating glaucoma surgeries have been developed as a safer and more acceptable surgical intervention to patients compared to conventional procedures.

Objectives

To compare the effectiveness of non-penetrating trabecular surgery compared with conventional trabeculectomy in people with glaucoma.

Search methods

We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (*The Cochrane Library* 2013, Issue 8), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to September 2013), EMBASE (January 1980 to September 2013), Latin American and Caribbean Literature on Health Sciences (LILACS) (January 1982 to September 2013), the *meta*Register of Controlled Trials (*m*RCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov) and the WHO International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictrp/search/en). We did not use any date or language restrictions in the electronic searches for trials. We last searched the electronic databases on 27 September 2013.

Selection criteria

This review included relevant randomised controlled trials (RCTs) and quasi-RCTs on participants undergoing standard trabeculectomy for open-angle glaucoma compared to non-penetrating surgery, specifically viscocanalostomy or deep sclerectomy, with or without adjunctive measures.

Data collection and analysis

Two review authors independently reviewed the titles and abstracts of the search results. We obtained full copies of all potentially eligible studies and assessed each one according to the definitions in the 'Criteria for considering studies' section of this review. We used standard methodological procedures expected by The Cochrane Collaboration.

Main results

We included five studies with a total of 311 eyes (247 participants) of which 133 eyes (participants) were quasi-randomised. One hundred and sixty eyes which had trabeculectomy were compared to 151 eyes that had non-penetrating glaucoma surgery (of which 101 eyes had deep sclerectomy and 50 eyes had viscocanalostomy). The confidence interval (CI) for the odds ratio (OR) of success (defined as achieving



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target eye pressure without eye drops) does not exclude a beneficial effect of either deep sclerectomy or trabeculectomy (OR 0.98, 95% CI 0.51 to 1.88). The odds of success in viscocanalostomy participants was lower than in trabeculectomy participants (OR 0.33, 95% CI 0.13 to 0.81). We did not combine the different types of non-penetrating surgery because there was evidence of a subgroup difference when examining total success. The odds ratio for achieving target eye pressure with or without eye drops was imprecise and was compatible with a beneficial effect of either trabeculectomy or non-penetrating filtration surgery (NPFS) (OR 0.79, 95% CI 0.35 to 1.79). Operative adjuvants were used in both treatment groups; more commonly in the NPFS group compared to the trabeculectomy group but no clear effect of their use could be determined. Although the studies were too small to provide definitive evidence regarding the relative safety of the surgical procedures we noted that there were relatively fewer complications with non-filtering surgery compared to trabeculectomy (17% and 65% respectively). Cataract was more commonly reported in the trabeculectomy studies. None of the five trials used quality of life measure questionnaires. The methodological quality of the studies was not good. Most studies were at high risk of bias in at least one domain and for many, there was lack of certainty due to incomplete reporting. Adequate sequence generation was noted only in one study. Similarly, only two studies avoided detection bias. We detected incomplete outcome data in three of the included studies.

Authors' conclusions

This review provides some limited evidence that control of IOP is better with trabeculectomy than viscocanalostomy. For deep sclerectomy, we cannot draw any useful conclusions. This may reflect surgical difficulties in performing non-penetrating procedures and the need for surgical experience. This review has highlighted the lack of use of quality of life outcomes and the need for higher methodological quality RCTs to address these issues. Since it is unlikely that better IOP control will be offered by NPFS, but that these techniques offer potential gains for patients in terms of quality of life, we feel that such a trial is likely to be of a non-inferiority design with quality of life measures.

PLAIN LANGUAGE SUMMARY

Comparison of two surgical techniques for the control of eye pressure in people with glaucoma

Increased eye pressure is the major risk factor for developing glaucoma (a group of eye diseases that lead to progressive, irreversible damage to the optic nerve (the nerve that transmits visual information from the retina to the brain)). Glaucoma is the second biggest cause of blindness worldwide. Eye pressure can be controlled surgically. Trabeculectomy (penetrating eye surgery) is the removal of a fullthickness block of the trabecular meshwork (eye filtration tissue) to make a hole that allows aqueous (watery fluid present in the front part of the eyes and partly responsible for eye pressure) to filter out of the eye. It is the standard surgical procedure and has been widely practised for over 40 years. Non-penetrating filtering surgical procedures, in which aqueous is allowed to filter out without the removal of a full-thickness block of trabecular tissue, also aim to control eye pressure and have the reputation of being safer than trabeculectomy. The most widely practised non-penetrating surgical procedures for glaucoma are viscocanalostomy and deep sclerectomy. Each procedure involves a different level of partial-thickness surgical dissection into the eye filtration tissue. Surgical success is defined as lowering the eye pressure to normal limits (less than 21 mmHg) for at least 12 months after surgery. This review included five trials with 311 eyes (267 participants). These studies included 160 eyes which had trabeculectomy compared to 151 eyes that had non-penetrating glaucoma surgery, of which 101 eyes had deep sclerectomy and 50 eyes had viscocanalostomy. This review showed that trabeculectomy is better in terms of achieving total success (pressure controlled without eyedrops) than non-penetrating filtering procedures. Although when we looked at the outcome of partial success (pressure controlled with additional eyedrops) it was more imprecise and our results could not exclude one surgical approach being better than the other. However, the review noted that these studies had some limitations regarding their design and were too small to give definitive information on differences in complications following surgery. None of the studies measured quality of life.