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[Intervention Review]

Laser trabeculoplasty for open angle glaucoma

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ABSTRACT

Background

Open angle glaucoma (OAG) is an important cause of blindness worldwide. Laser trabeculoplasty, a treatment modality, still does not have a clear position in the treatment sequence.

Objectives

The objective of this review was to study the effects of laser trabeculoplasty for OAG.

Search methods

We identified trials from CENTRAL in *The Cochrane Library*, MEDLINE, EMBASE, LILACS and manual searching. We also contacted researchers in the field.

Selection criteria

We included randomised controlled trials comparing laser trabeculoplasty with no intervention, with medical treatment, or with surgery. We also included trials comparing different technical modalities of laser trabeculoplasty.

Data collection and analysis

Two authors independently assessed trial quality and extracted the data. We contacted trial investigators for missing information.

Main results

This review included 19 trials involving 2137 participants. Only five trials fulfilled the criteria of good methodological quality. One trial compared laser trabeculoplasty with topical beta-blocker to no intervention in early glaucoma. The risk of glaucoma progression was higher in the control group at six years of follow up (risk ratio (RR) 0.71 95% confidence interval (CI) 0.53 to 0.95). No difference in health-related quality of life was observed between the two groups. Three trials compared laser trabeculoplasty to medication (regimens used before the 1990s) in people with newly diagnosed OAG. The risk of uncontrolled intraocular pressure (IOP) was higher in the medication group compared to the trabeculoplasty group at six months and two years of follow up. Three trials compared laser trabeculoplasty with trabeculectomy. The risk of uncontrolled IOP was significantly higher in the trabeculoplasty group at six months but significant heterogeneity was observed at two years. Diode and selective laser are compared to argon laser trabeculoplasty in three trials and there is some evidence showing a comparable effect in controlling IOP at six months and one year of follow up.

Authors' conclusions

Evidence suggests that, in people with newly diagnosed OAG, the risk of uncontrolled IOP is higher in people treated with medication used before the 1990s when compared to laser trabeculoplasty at two years follow up. Trabeculoplasty is less effective than trabeculectomy in controlling IOP at six months and two years follow up. Different laser technology and protocol modalities were compared to the traditional laser trabeculoplasty and more evidence is necessary to determine if they are equivalent or not. There is no evidence to determine the effectiveness of laser trabeculoplasty compared to contemporary medication (prostaglandin analogues, topical anhydrase inhibitors and alpha2-agonists) and also with contemporary surgical techniques. Also there should be further investigation in to the effectiveness of laser trabeculoplasty in specific racial groups, specific diagnostic groups, such as pseudoexfoliation and pigmentary glaucoma and different stages of OAG. More research is also required determining cost-effectiveness of laser trabeculoplasty in the management of glaucoma.

PLAIN LANGUAGE SUMMARY

Laser trabeculoplasty for open angle glaucoma

Glaucoma is a chronic progressive disease of the optic nerve which, if not treated, leads to visual field decay and blindness at end stages. Intraocular pressure (IOP) decreasing is shown to diminish the progression of the disease, and could be achieved by the chronic use of hypotensive eyedrops, incisional surgery or laser trabeculoplasty. There is still great controversy about where in the treatment scale laser trabeculoplasty is positioned, although this technique has already been described three decades ago. This treatment consists of application of laser spots in the trabecular meshwork, the structure responsible for the aqueous humor drainage, leading to an increase in the outflow facility through it and in consequence, decreasing IOP. It is an interesting form of treatment since it does not depend on chronic instillation of eyedrops, as does medical treatment, and also does not have too many complications, as does incisional surgery. This review included 19 trials (2137 participants). One trial compared laser trabeculoplasty associated with a hypotensive eyedrop with no intervention, and at six years of follow up the risk of visual field decay was greater in non treated participants. Three trials compared hypotensive eyedrops with trabeculoplasty, and the risk of uncontrolled IOP was greater at two years in the laser group. It is necessary to mention that the eyedrops used in these trials differ significantly from the ones used currently, since these trials were developed a decade ago. Three other trials compared trabeculoplasty with trabeculectomy and the risk of uncontrolled IOP was higher in the laser group at six months of follow up. There is some evidence showing that diode laser and selective trabeculoplasty have similar effect in controlling IOP when compared to argon laser trabeculoplasty. Comparisons of different lasers and different techniques of application were done in the remaining trials, but there is still not enough evidence to determine which is the best treatment protocol. Further research is necessary to compare trabeculoplasty with new hypotensive eyedrops and also the results of laser therapy in people of different ethnicities, since some studies suggest that they have a different response to this kind of laser therapy. More research is required to analyse cost-effectiveness of these interventions.