Interventions for angle-closure glaucoma

Saw S M, Gazzard G, Friedman D S

CRD summary
This review assessed interventions for angle-closure glaucoma. The authors concluded that laser peripheral iridotomy (LPI) should be recommended for acute angle closure and prophylaxis of the contralateral eye. Latanoprost and timolol can be used in those with primary angle closure when LPI has failed. There is insufficient evidence to recommend other treatments. However, owing to limitations in the reporting of the study characteristics and the review process, these conclusions cannot be verified.

Authors' objectives
The objective was to evaluate interventions used to treat acute angle closure (AAC) and primary angle closure (PAC), with or without glaucomatous optic neuropathy.

Searching
MEDLINE, PubMed, EMBASE and the Cochrane Library were searched from 1968 to 2002 for English language publications. The reference lists of existing reviews and retrieved articles were checked for additional studies.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), prospective and retrospective controlled clinical trials (CCTs) and retrospective case series with more than 50 participants were eligible for inclusion.

Specific interventions included in the review
Specific inclusion criteria for the interventions were not reported in the review. The interventions evaluated in the included studies were laser, surgery and medical therapy. The laser techniques used were laser peripheral iridoplasty and iridectomy. The surgical techniques used were surgical peripheral iridectomy, trabeculectomy, non-filtering surgery, goniosynechialysis, and combined phaco-goniosynechialysis. Medical therapy was pilocarpine, latanoprost or timolol. Further details were provided.

Participants included in the review
Specific inclusion criteria for the participants were not reported in the review. Participants with AAC, PAC, AAC glaucoma and PAC glaucoma were included in the review. Further information on the signs and symptoms used to define these conditions were provided. The included studies were conducted predominantly in white or Asian populations.

Outcomes assessed in the review
Specific inclusion criteria for the outcomes were not reported in the review. The outcomes frequently reported in the included studies were the reduction in intraocular pressure (IOP), the occurrence or recurrence of AAC, progression to PAC glaucoma, progression of visual field loss, or loss of visual acuity.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the articles for inclusion. A third reviewer was consulted if there were any discrepancies.

Assessment of study quality
The validity of each included study was assessed in relation to: randomisation procedure, blinding, diagnostic criteria used for glaucoma, inclusion and exclusion criteria, description of intervention and control groups, length of follow-up, and loss to follow-up in each comparison group. Each study was assigned a rating of I, II or III based on the strength of...
the evidence presented, according to criteria developed by the American Academy of Ophthalmology's glaucoma panel (see Other Publications of Related Interest). The authors did not state how the papers were assessed for validity, or how many reviewers performed the validity assessment.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted for each outcome and adverse event, as reported in the included study.

Methods of synthesis
How were the studies combined?
The studies were tabulated and combined in a narrative discussion, according to the condition and the type of intervention.

How were differences between studies investigated?
Differences between the studies were discussed narratively, according to study design.

Results of the review
Nine RCTs (n=387) and 24 non-randomised clinical trials and case series (n=1,707) were included in the review.

AAC or AAC glaucoma.

One RCT compared laser peripheral iridotomy (LPI) with surgical peripheral iridectomy (SPI) and found no significant difference in visual acuity or IOP. One RCT compared four different types of laser treatment and found that IOP of less than 22 mmHg, with or without medication, ranged from 17 to 33% of patients treated with one of three lasers, while visual field loss progression ranged from 77.8 to 41.7% of patients treated with one of two lasers. One CCT also found no significant difference in visual acuity between LPI and SPI. Two retrospective case series found that 36.6 to 44% of patients with AAC or AAC glaucoma did not require long-term medication or additional surgery following treatment with peripheral iridectomy. One non-controlled study evaluated bilateral LPI and found that 63.4% of patients required additional long-term surgical treatment. One non-controlled study evaluated long- and short-burn LPI and found that IOP was controlled in 92.1% and 87.5% of the patients, respectively.

No study evaluated the efficacy of medical therapy. One RCT evaluated mode of delivery. No significant difference in percentage decrease in IOP was found between Ocusert Pilo-40 compared with either intensive pilocarpine or low-dose pilocarpine.

No RCT evaluated the effectiveness of non-filtering surgery or trabeculectomy for AAC or AAC glaucoma. One retrospective case series of 32 patients with AAC who did not respond to medical treatment and underwent trabeculectomy found that 56.2% had a successful long-term IOP without antiglaucoma treatment.

PAC or PAC glaucoma.

One RCT compared two types of LPI and found no difference in the mean IOP. One CCT compared LPI with SPI and found an overall reduction in IOP of 1.72 mmHg for both groups combined. One prospective non-controlled trial and one retrospective case series found that 51.3% and 81.9% of the patients, respectively, required further medication and 29.5% and 53% required surgery following treatment with LPI. One retrospective case series found that IOP was successfully controlled in 75.3% of the patients treated with LPI and 76.4% of those treated with SPI.

One RCT found that latanoprost was associated with a significant reduction in IOP compared with timolol in patients with PAC glaucoma. One RCT compared timolol with no treatment and found no significant difference in IOP, visual field loss or progression to PAC glaucoma.

No RCT evaluated the effectiveness of surgery for PAC or PAC glaucoma. One CCT found that trabeculectomy was associated with a greater overall success compared with goniosynechialysis in patients with PAC glaucoma. One case
series found that combined phaco-goniosynechialysis treatment in patients with PAC glaucoma was associated with a 90% success rate in maintaining an IOP of less than 20 mmHg without medication, improved or unchanged visual acuity, and a reduction in peripheral anterior synechiae. One case series evaluated cataract extraction and found that IOP was controlled without medication in 40% of the patients.

Contralateral eye prophylaxis.

Two RCTs compared the effectiveness of prophylactic LPI with SPI in the contralateral eye of patients with AAC and found no significant difference in visual acuity or IOP. One case series found that 88.8% of patients with AAC had successful long-term control of IOP with no additional glaucoma treatment, and no new cases of AAC glaucoma were observed.

Mixed population.

One RCT compared two types of LPI and found no significant difference in IOP. Five non-controlled trials and three retrospective case series evaluated different types of LPI. No conclusive evidence was presented.

Authors’ conclusions

LPI should be recommended for the treatment of AAC and for prophylactic treatment of the contralateral eye. Latanoprost and timolol can be used to treat patients with PAC glaucoma in which LPI treatment has failed. There was insufficient evidence to recommend other treatments for AAC, PAC, PAC glaucoma and prophylaxis of the contralateral eye.

CRD commentary

The review lacked explicit inclusion criteria in terms of the participants, interventions, outcomes, and study design. This means it is difficult to interpret the treatment results. The search was restricted by language, thus the potential for language bias cannot be ruled out. Methods to minimise bias were used when selecting the studies for inclusion. The methods used to extract the data and assess the validity of the included studies were not reported; therefore, the potential for reviewer bias or error cannot be assessed. Quality criteria were extracted for each of the included studies, but were not used to rate the quality of the studies. Instead, a grading was determined for each intervention as opposed to each study.

The decision to present the results in a narrative discussion was appropriate given the clinical and methodological differences between the studies. However, there were discrepancies between the tabulated studies and those reported in the text. This makes it difficult to ascertain the reliability of the authors’ conclusions. Given the lack of a systematic assessment of validity and the lack of clarity in the reporting of the studies, it is unclear whether the evidence presented supports the authors’ conclusions and recommendations for practice.

Implications of the review for practice and research

Practice: The authors stated that LPI is recommended for the treatment of patients with AAC or AAC glaucoma; as first-line treatment in patients with PAC or PAC glaucoma; and as contralateral eye prophylaxis in patients with AAC or AAC glaucoma. Latanoprost and timolol are recommended, as monotherapy, for the treatment of PAC glaucoma in which LPI has failed.

Research: The authors stated that further research to evaluate the effectiveness of different treatments for angle-closure glaucoma, particularly in Asian populations, is needed.

Bibliographic details


PubMedID
Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Acute Disease; Antihypertensive Agents /therapeutic use; Evidence-Based Medicine; Glaucoma, Angle-Closure /therapy; Humans; Intraocular Pressure /drug effects; Iridectomy /methods; Prospective Studies; Prostaglandins F, Synthetic /therapeutic use; Randomized Controlled Trials as Topic

AccessionNumber
12003002113

Date bibliographic record published
31/03/2005

Date abstract record published
31/03/2005

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.