Cyclodiode laser therapy for painful, blind glaucomatous eyes

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Abstract
Aims—To determine the ability of cyclodiode laser treatment to relieve discomfort in painful blind glaucomatous eyes.

Methods—30 eyes underwent cyclodiode to reduce intraocular pressure (IOP) and relieve pain. Patients graded their pre-cyclodiode and post-cyclodiode pain.

Results—After a minimum follow up of 6 months, a single cyclodiode treatment lowered mean IOP from 51 mm Hg (95% CI plus or minus 3.7 mm Hg) to 26 mm Hg (95% CI plus or minus 5.8 mm Hg) providing pain relief in 73.3% (22/30). After retreatment of six eyes, mean IOP was reduced to 22 (95% CI plus or minus 5.3) mm Hg and pain relief was obtained in 96.7% (29/30). For eyes achieving pain relief after one treatment, IOP was reduced by >30% in 81.0% (17/21). For eyes not achieving pain relief after one treatment, IOP was reduced by >30% in only 22.2% (2/9) (p=0.0042, Fisher's exact test).

Conclusion—Cyclodiode was highly successful in providing pain relief in painful blind hypertensive glaucomatous eyes. The best predictor of successful pain relief was IOP reduction of >30% from baseline.

Cyclodiode laser therapy is being used increasingly to treat refractory glaucoma. In patients with blind and painful eyes, perhaps the most important outcome measure is whether or not treatment renders the affected eye comfortable, yet few published studies have considered symptom relief as an outcome. The aim of the current study was to establish the ability of cyclodiode to improve comfort in patients with painful, blind eyes due to glaucoma. Our secondary aim was to establish which treatment related variables correlated with the achievement of a comfortable eye.

Materials and methods
The study design was prospective, longitudinal, and observational. Thirty patients (30 eyes) meeting the inclusion criteria (visual acuity worse than hand movements at 1 metre, significant ocular discomfort, IOP >30 mm Hg, and no previous cyclodestroctive procedures) were recruited between May 1998 and May 1999. Mean age was 73 years (SD 12.2 years). Eighteen patients had neovascular glaucoma, four had aphakic glaucoma, two had raised IOP following vitreoretinal surgery, and six had multiple pathologies. Informed consent was obtained in all cases. The aim of cyclodiode treatment was to achieve adequate IOP reduction and a comfortable eye. Minimum follow up was 6 months (mean 10.8 months, range 6–22 months). All patients were assessed 2–4 weeks after treatment. The frequency of further follow up was at the discretion of the clinician with a mean of 2.6 (1.13) visits between 1 month and 1 year.

Patients graded their ocular discomfort before and at each assessment after cyclodiode treatment. Pain was graded as “severe” (grade 3), “moderate” (grade 2), “mild” (grade 1), or “none” (grade 0). Topical and systemic treatment, visual acuity and IOP were recorded at each pretreatment and post-treatment visit.

Cyclodiode treatment was performed under peribulbar anaesthesia with 2% lignocaine using the Oculight SLX semiconductor diode 810 nm laser (Iris Medical Instruments Inc, Mountain View, CA, USA) and the contact G-probe (Iris Medical Instruments). Treatment was delivered through a 600 µm quartz fibre protruding 0.7 mm from the G-probe contact surface to indent the conjunctiva and sclera, thus improving energy delivery to the ciliary body. Transillumination was used to identify the ciliary body and 40 laser “shots” were applied, 10 in each quadrant of the ciliary body sparing the 3 and 9 o’clock positions. For first treatment sessions, the power of each shot was 1500 mW for 1500 ms (90 J per session). For retreatments, the duration of each shot was increased to 2000 ms (120 J per session). The criteria for retreatment were persistent pain and IOP >30 mm Hg. Topical dexamethasone 0.1% was administered four times daily for 1 month after each cyclodiode treatment.

Results
CHANGE IN INTRAOCULAR PRESSURE (FIG 1)
The mean IOP recorded on the day of cyclodiode treatment was 51 mm Hg (95% CI plus or minus 3.7 mm Hg, range 34–72 mm Hg). After a single cyclodiode treatment, the mean IOP fell to 26 mm Hg (95% CI plus or minus 5.8 mm Hg, range 1–66 mm Hg). At final follow up, after one (n=23), two (n=6), or three (n=1) cyclodiode treatments, the mean IOP was 22 mm Hg (95% CI plus or minus 5.3 mm Hg, range 1–66 mm Hg). Twenty two of 30 eyes (73.3%) had an IOP reduction of greater than 30% with one treatment, and 27 of 30 eyes achieved a 30% reduction when retreatments were included.

PRE-CYCLODiode AND POST-CYClODiODE ANTIGLAUCOMATOUS THERAPY
Before cyclodiode treatment, five patients (16.7%) were receiving oral acetazolamide treatment compared with two patients (6.7%)
Cyclodiode laser therapy very effectively eliminated discomfort in previously painful, blind, glaucomatous eyes. The best predictor of successful pain relief was reduction in IOP of >30% from baseline. “Ideal” treatment parameters remain uncertain and protocols using slightly less total energy delivery to the ciliary body might have a lower risk of hypotony, although a corresponding increase in the need for retreatments might be expected.
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doi: 10.1136/bjo.85.4.474

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