

New Treatment Options for Glaucoma

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Prostaglandins in the Management of Glaucoma

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Recent clinical trials have shown that most glaucoma damage is pressure-dependent and therefore avoidable. However, aggressive lowering of intraocular pressure (IOP) is required to achieve optimal glaucoma management.

The Advanced Glaucoma Intervention Study found that the optimal IOP for patients with primary open angle glaucoma (POAG) and moderate to severe damage is 12 mm Hg.¹ Patients with an average IOP of 15 mm Hg or more experienced progression of visual field defects. According to the Comparison of Initial Glaucoma Treatment Study, an average 37% reduction in IOP from 27.0 to 17.5 mm Hg resulted in no net visual field progression over 5 years for patients with newly diagnosed POAG with mild damage.²

The Early Manifest Glaucoma Trial found an average 29% reduction in IOP achieved a 50% reduction in relative risk of

progression for newly diagnosed patients with POAG.³ However, this study did not advance treatment for patients in whom the target pressure was not achieved.

So-called normal tension glaucoma also requires IOP reduction for optimum management. The Collaborative Normal-Tension Glaucoma Study showed that lowering the IOP by 30% from 16 to 11 mm Hg reduced the risk of progression from 60% to 20% after 5 years for high-risk patients.⁴

For patients with ocular hypertension, lowering the IOP by 20% reduces the risk of progressing to glaucoma. For each mm Hg the IOP was lowered, the relative risk was reduced by 10%.

Prostaglandin Analogues to Achieve Target Pressures

Prostaglandin analogues are potent drugs that are capable of reducing the IOP by approximately 33% compared with only 25% for β -blockers. Since the results of most glaucoma studies suggest achieving an initial 30% to 35% reduction in IOP, a prostaglandin analogue is thought to be the most appropriate first-line therapy.

Three prostaglandin analogues — latanoprost, travoprost, and bimatoprost —

have been compared for efficacy and safety in the XLT study.⁵ Nearly equal reductions were found at 8 am for the 3 drugs and there were no significant differences in the diurnal average reductions (Table 1). However, travoprost and bimatoprost caused a greater number of side effects than latanoprost, in particular red irritated eyes. Latanoprost is therefore recommended as initial therapy, and a 1-eye trial should commence to ensure efficacy.

In Summary

Clinical trials will help to guide clinicians seeking target pressures to prevent visual field damage and progression of glaucoma. Potent medical, laser, and surgical therapies are now available to help achieve these goals. Clinical judgement remains important for evaluating the efficacy and side effects of each individual treatment and to modify the targets as time progresses.

References

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Table 1. Comparison of latanoprost, travoprost, and bimatoprost for treatment of glaucoma.

Parameter	Latanoprost	Travoprost	Bimatoprost
Intraocular pressure reduction at 8 am (mm Hg)	8.6	7.9	8.7
Diurnal average reduction (mm Hg)	7.0	6.7	7.3

Challenges in the Management of Glaucoma in the Next Decade

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Second only to cataract, glaucoma is the leading cause of preventable blindness worldwide. Primary open angle glaucoma (POAG) is the commonest type of glaucoma overall and in Asia. Increasingly, epidemiological information is able to identify the scale of the challenge.

Diagnosis of POAG mainly depends on detection of raised IOP. Increased awareness of this among eye health care workers throughout the region is vital, as is the need for identification of glaucoma by gonioscopy and to view the optic disc. In developed countries, the availability of more sophisticated disc imaging will enhance both diagnosis and follow up.

Reduction in IOP will remain the cornerstone of treatment. Newer drugs will continue to improve compliance and safety, as will newer methods of drug delivery. Surgical techniques will continue to evolve, and newer lasers will benefit more patients. Drainage procedures will benefit from advances in control of wound healing.

Beyond IOP reduction is the hope of effective and safe neuroprotection and more effective protection of the blood supply. Intriguing possibilities for the future are offered by genetic manipulation.

Latanoprost for Chronic Angle Closure Glaucoma

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This double-blind randomised study compared the IOP-reducing effect and safety of latanoprost once daily with timolol twice

Table 1. Reduction in intraocular pressure (IOP) from baseline of patients with glaucoma treated with latanoprost or timolol.

	Latanoprost	Timolol
IOP reduction (mm Hg)	8.8 ± 1.1	5.7 ± 0.9
p Value	<0.001	<0.001

daily in 30 patients with primary chronic angle closure glaucoma (CAGG).

Two patients receiving timolol were withdrawn due to inadequate IOP control. Compared with baseline, the IOP after 2 weeks of treatment was statistically significantly reduced in both groups (Table 1). The difference in IOP reduction between the 2 treatment groups was 3.1 ± 1.5 mm Hg in favour of latanoprost (p = 0.04). The main ocular adverse events were conjunctival hyperaemia and discomfort, and were reported in both groups.

This study concluded that a significantly greater IOP reduction was achieved with latanoprost than with timolol in patients with CAGG. These results suggest that latanoprost may be a therapeutic choice for the medical management of primary CAGG.

Latanoprost for Normal Tension Glaucoma

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This study examined the IOP-reducing effect of latanoprost in 2 groups of patients with normal tension glaucoma. One group comprised 40 newly diagnosed patients, while the second group of 40 patients had been treated with other glaucoma drugs. Newly diagnosed patients began treatment with latanoprost and the patients already being treated for

Table 1. Intraocular pressure (IOP) reduction from baseline after 4 and 8 weeks of latanoprost therapy.

IOP reduction (mm Hg)	Baseline	4 Weeks	8 Weeks
Newly diagnosed patients	16.9 ± 2.5	14.3 ± 1.8	14.1 ± 2.2
Known glaucoma patients	16.0 ± 2.8	13.7 ± 2.9	13.2 ± 2.5

glaucoma substituted latanoprost for the already-used glaucoma medication. IOP was measured at baseline, and 4 weeks and 8 weeks after treatment with latanoprost had started.

Among the newly-diagnosed patients, 39 were followed up for 8 weeks. Eighteen patients (46%) had ≥20% IOP reduction at 8 weeks (Table 1). In the second group, 34

patients were followed up for 8 weeks. Seventeen patients (50%) showed ≥20% IOP reduction at 8 weeks.

This study concluded that latanoprost is useful as both first- and second-line medication for patients with normal tension glaucoma. Good IOP reduction is achieved, even when the baseline IOP is not so high.

