Brimonidine 0.2% behaviour on intraocular pressure in Timolol-uncontrolled glaucomatous patients

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Key words: beta-blocker – alpha-adrenoceptor agonist – long-term drift – glaucoma.

Introduction

The effect of beta-blockers on intraocular pressure (IOP) can decrease with time. This clinically observed phenomenon occurs in two phases: short-term escape and long-term drift (Boger 1983). In a recent study Gandolfi and Vecchi observed that the efficacy of Timolol is maintained for a longer time if the beta-blocker is pulsed with an adrenergic agonist (Gandolfi et al. 1996). At present there is on the market a new drug, Brimonidine 0.2%, a potent alpha-adrenoceptor agonist with high selectivity for the alpha2 receptors (Toris et al. 1995). It has notably higher affinity for the alpha2 receptor than does clonidine or apraclonidine. Topically applied, brimonidine reduced aqueous flow (Serle, Steidt et al. 1991) and increased uveoscleral outflow (Serle, Podos et al. 1991).

The aim of this study is to evaluate the IOP efficacy of Brimonidine 0.2% in glaucomatous patients with respect to the phenomenon of long-term drift.

Patients and Methods

We enrolled 12 patients with primary open angle glaucoma diagnosis who had been receiving Timolol therapy for at least 1 year.

Ophthalmic exclusion criteria included:

- any history of ocular diseases (chronic or recurrent inflammatory eye disease; ocular trauma; ocular infection; severe retinal disease; corneal abnormality preventing reliable applanation tonometry);
- intraocular surgery within the past 12 months or laser surgery within the past 3 months;
- inability to discontinue contact lens wear during the study.

Systemic exclusions included:

- severe unstable or uncontrolled systemic disease;
- pregnancy, lactation or childbearing potential;
- contraindication to alpha-adrenoreceptor agonist (such as depression, coronary insufficiency, Raynaud phenomenon).

We obtained a diurnal tonometric curve for each patient on beta-blocker therapy. At the end of the curve, we substituted Brimonidine 0.2% b.i.d. for Timolol 0.5% b.i.d. The IOP (daily curve) was measured again 1 and 3 months later. For the statistical analysis, we recorded the average of the two highest values of the IOP through the daily curve. Results are presented as mean±standard deviation. Unpaired-sample Student's t-test was used for the statistical analysis with $p<0.05$ considered statistically significant (Systat 5.2, Macintosh, Tolentino, USA).

Table 1.

	Intraocular pressure	IOP reduction %	p
Timolol	21.8±1.4		
Brimonidine (after 1 month)	18.3±3.4	16.05	<0.001
Brimonidine (after 3 months)	16.4±2.5	24.7	<0.0001

Results

There was no statistically significant difference between the two eyes, so we concentrated on the right eyes (n=12) of the 12 patients (8 females, 4 males) whose mean age was 66.83 years (range 56–82), and mean IOP with Timolol 0.5% therapy was 21.8±1.4 mmHg. After 1 month of Brimonidine 0.2% therapy, the mean IOP was 18.3±3.4 mmHg with a 16.05% mean reduction. After 3 months of therapy with Brimonidine 0.2%, the mean IOP was 16.4±2.5 mmHg with a 24.7% mean reduction. The IOP reduction was statistically significant both after 1 month ($p<0.001$) and 3 months ($p<0.0001$).

Conclusions

Although the exact mechanism of the long-term drift is not clear, the phenomenon is well known. In patients with long-term drift, Brimonidine 0.2% could be a welcome alternative to beta-blocker therapy.

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