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Original Research

To evaluate efficacy of Dorzolamide 2 percent timolol 0.5 percent fixed combination therapy in patients of primary open angle glaucoma

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ABSTRACT:
Background: The present study was conducted for evaluating the efficacy of Dorzolamide 2 percent timolol 0.5 percent fixed combination therapy in patients of primary open angle glaucoma. **Materials & methods:** The present study was conducted on 20 patients of POAG attending the outpatient Department of Ophthalmology. Fixed drug combination of Dorzolamide2%/ Timolol 0.5% (DTFC) dosed twice daily at a difference of 12 hours. All the patients were instilled 1 drop of DTFC ophthalmic solution into study eye twice daily for 6 weeks. Patients was then be called for follow up at 2nd week, 4th week and 6th week during the study period and IOP was recorded. The eye that was affected was considered as the study eye. Patients having bilateral POAG were treated for both eyes, but only the one eye fulfilling the inclusion criteria was taken as the study eye. IOP readings were taken from the study eye with the Goldmann applanation tonometer (GAT) at each visit. All the results were analysed by SPSS software **Results:** Mean IOP at visit 1, visit 2, visit 3 and visit 4 was 27.23 mm of Hg, 17.26 mm of Hg, 16.72 mm of Hg and 15.33 mm of Hg respectively. Mean percentage reduction at visit 1, visit 2 and visit 3 was 36.49 percent, 38.59 percent and 43.7 percent respectively.Conjunctival Hyperemia, eye irritation and taste perversion were seen in 20 percent, 5 percent and 5 percent of the patients respectively. **Conclusion:** The fixed combination of brinzolamide and timolol has been shown to be efficacious and the added utility of providing two medications in one formula may improve patient compliance with the medication.
Key words: Dorzolamide, Timolol, Glaucoma

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INTRODUCTION

Glaucoma is a chronic, degenerative optic neuropathy that can be distinguished from most other forms of acquired optic neuropathy by the characteristic appearance of the optic nerve. In glaucoma, the neuroretinal rim of the optic nerve becomes progressively thinner, thereby enlarging the optic-nerve cup. This phenomenon is referred to as optic-nerve cupping. Its cause is the loss of retinal ganglion cell axons, along with supporting glia and vasculature. The remaining neuroretinal rim retains its normal pink color. In other optic neuropathies, the optic-nerve tissue loses its pink color and cupping does not develop. A rare exception is arteritic anterior ischemic optic neuropathy, in which cupping can occur. Patients with glaucoma typically lose peripheral vision and may lose all vision if not treated.[1-3]

People who have been diagnosed with primary open angle glaucoma (POAG) will have a lot of new information to absorb, and they may struggle to come to terms with being told that they may lose their sight or – more frequently – with the fact that the sight they have already lost cannot be restored. Patients also have different ways of dealing emotionally with a diagnosis of POAG. They may postpone taking any action, go into denial, or may seek help from other providers, some of whom may have harmful practices.[4-6]

The nonselective β-blocker timolol and the carbonic anhydrase inhibitor dorzolamide both lower intraocular pressure (IOP). Timolol and dorzolamide

have different mechanisms of action and their effects are additive when administered together. Therefore, the 2 drugs are frequently used concomitantly to treat patients with open-angle glaucoma who have not adequately responded to first-line therapy. A barrier to good compliance with concomitant therapy is the need to administer 5 or 6 drops of medication on 2 or 4 occasions during the day. Timolol 0.5% and dorzolamide 2.0% have therefore been combined in a single formulation, reducing the number of administrations required to 2 per day.[6- 8]Hence; the present study was conducted for evaluating the efficacy of Dorzolamide 2 percent timolol 0.5 percent fixed combination therapy in patients of primary open angle glaucoma.

MATERIALS & METHODS

The present study was conducted on 20 patients of POAG attending the outpatient Department of Ophthalmology. Inclusion criteria for present study included patients with minimum age of 20 years and patients having unilateral/bilateral primary open angle glaucoma diagnosed by tonometry and gonioscopy and patients. Complete demographic details of all the patients were obtained. Baseline IOP was recorded at twice at interval of two hours on day 0 of the study. Fixed drug combination of Dorzolamide2%/ Timolol 0.5% (DTFC) dosed twice daily at a difference of 12 hours. All the patients were instilled 1 drop of DTFC ophthalmic solution into study eye twice daily for 6 weeks. Patients was then be called for follow up at 2nd week, 4th week and 6th week during the study period and IOP was recorded. The eye that was affected was considered as the study eye. Patients having bilateral POAG were treated for both eyes, but only the one eye fulfilling the inclusion criteria was taken as the study eye.IOP readings were taken from the study eye with the Goldmann applanation tonometer (GAT) at each visit.All the results were analysed by SPSS software. Univariate analysis was done for evaluation of level of significance.

RESULTS

A total of 20 patients were enrolled. Mean age of the patients was 42.8 years. Out of 20 patients, 60 percent of the patients were males while the remaining were females. Mean IOP at visit 1, visit 2, visit 3 and visit 4 was 27.23 mm of Hg, 17.26 mm of Hg, 16.72 mm of Hg and 15.33 mm of Hg respectively. Mean percentage reduction at visit 1, visit 2 and visit 3 was 36.49 percent, 38.59 percent and 43.7 percent respectively. Conjunctival Hyperemia, eye irritation and taste perversion were seen in 20 percent, 5 percent and 5 percent of the patients respectively.

Table 1: Reduction in Mean IOP Over Follow Up visit

Visits	Mean (mm of Hg)	SD	Difference	Percentage Reduction
Visit 1 (Baseline)	27.23	1.25	-	-
Visit 2	17.26	1.11	9.97	36.49
Visit 3	16.72	1.08	10.51	38.59
Visit 4	15.33	1.03	11.9	43.70

Table 2: Side Effect

Side Effect	Number	Percentage
Conjunctival Hyperemia	5	20
Eye Irritation	1	5
Taste Perversion	1	5

DISCUSSION

Primary open angle glaucoma (POAG) involves a spectrum of disorders typified by a characteristic optic neuropathy and field loss in eyes with open drainage angles. It is currently a leading cause of blindness worldwide, and in the future should become even more important as populations age throughout the world. Limitations in optic disc and retinal nerve fibre layer assessment have stimulated the development of imaging devices that measure either the optic disc cup and neuroretinal rim area or the retinal nerve fibre layer. The most advanced at present are scanning laser tomography and scanning laser polarimetry (retinal nerve fibre analyser). They offer greater objectivity but are limited by potential sources of error and so the results must still be interpreted in association with clinical findings. This quantitative imaging may be useful in early diagnosis before obvious visual field loss occurs and may allow increased sensitivity to detect progression of the condition.[8-10]Dorzolamide/timolol comprises dorzolamide, a highly selective inhibitor of carbonic anhydrase isoenzyme II, and timolol, a nonselective β-adrenergic antagonist. Both components decrease elevated IOP by inhibiting aqueous humour production; they each achieve this by a different mechanism of action and have an additive effect when administered together. Dorzolamide/timolol also improves some markers of ocular blood flow.[9, 10]

In a previous study conducted by PharmD M et al, authors compare topical brinzolamide 1% twice daily with dorzolamide 2% twice daily, each given with timolol 0.5% twice daily, for safety and effects on intraocular pressure in patients with primary open-angle glaucoma.Clinically relevant intraocular pressure reductions were manifested by 50.0% to 89.3% of patients under brinzolamide plus timolol and by 43.9% to 85.4% under dorzolamide plus timolol.

The treatments were equivalent in mean intraocular pressure-lowering. In general, both regimens were well tolerated. In terms of intraocular pressure reduction, brinzolamide 1% twice daily was equivalent to dorzolamide 2% twice daily, each added to timolol 0.5% twice daily, but brinzolamide produced significantly less ocular burning and stinging.[11]Kałuz˚ny JJ et al, in another previous study, established the efficacy and safety of timolol maleate/dorzolamide fixed combination (TDFC) versus timolol maleate/pilocarpine fixed combination (TPFC), each given twice daily, in primary open-angle glaucoma or ocular hypertensive patients. The mean diurnal curve IOP was 18.1 2.2 mmHg for TDFC and 16.7 1.9 mmHg for TPFC. At the remaining time-points, TPFC IOPs were statistically lower than TDFC IOPs. There were statistically more unsolicited reports of vision change and ocular pain associated with TPFC. Six patients were discontinued early from TPFC therapy versus two from TDFC. Their study suggested that TPFC can provide at least a similar efficacious reduction in IOP as TDFC in patients with primary open-angle glaucoma or ocular hypertension.[12]

In a similar previous study conducted by Michaud JE et al, authors compared topical brinzolamide 1% twice daily with dorzolamide 2% twice daily, each given with timolol 0.5% twice daily, for safety and effects on intraocular pressure in patients with primary open-angle glaucoma or ocular hypertension.The treatments were equivalent in mean intraocular pressure-lowering. In general, both regimens were well tolerated. However, more patients (P =.001) experienced at least one adverse event with dorzolamide plus timolol (32.8%) as compared with brinzolamide plus timolol (14.7%); also, more patients (P =.001) experienced ocular discomfort (stinging and burning) after dorzolamide plus timolol (13.1%) than after brinzolamide plus timolol (1.7%).In terms of intraocular pressure reduction, brinzolamide 1% twice daily was equivalent to dorzolamide 2% twice daily, each added to timolol 0.5% twice daily, but brinzolamide produced significantly less ocular burning and stinging.[13]

CONCLUSION

The fixed combination of brinzolamide and timolol has been shown to be efficacious and the added utility of providing two medications in one formula may improve patient compliance with the medication.

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