ORIGINAL RESEARCH

Assessment of the 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: Glaucoma is a chronic and progressive condition characterized by degeneration of the optic nerve, which can be differentiated from other types of acquired optic neuropathy by the distinctive morphology of the optic nerve head. Hence; the present study was conducted for assessing the efficacy of Dorzolamide 2 percent timolol 0.5 percent fixed combination therapy in patients of primary open angle glaucoma. **Materials & methods:** A total of 20 patients of POAG were enrolled. Patients fulfilling the inclusion criteria and having none of the exclusion criteria were enrolled in the study after obtaining written informed consent. The data obtained was compiled on a proforma and appropriate tests will thus be applied.Fixed drug combination of Dorzolamide2%/ Timolol 0.5% (DTFC) dosed twice daily. Patients was then be called for follow up at 2ndweek, 4thweek and 6thweek during the study period and IOP was recorded. In both the groups, the eye that was affected was considered 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 analyzed by SPSS software. **Results:** Mean age of the patients was 61.3 years. 60 percent of the patients were males while the remaining were females. Mean IOP at baseline, at visit 1, visit 2, visit 3 and visit 4 was 29.7, 28.9, 19.1, 15.9 and 14.2 respectively. Significant results were obtained while comparing the mean IOP at different time intervals. Conjunctival hyperemia, eye irritation and taste perversion were seen in 20 percent, 5 percent and 5 percent of the patients respectively. **Conclusion:** Dorzolamide/timolol represents a well-tolerated and efficacious fixed combination therapy for the reduction of intraocular pressure (IOP) in patients with open-angle glaucoma. This formulation is particularly beneficial for individuals who do not achieve sufficient control with first-line monotherapy.

Key words: Dorzolamide, Timolol, Glaucoma

INTRODUCTION

Glaucoma is a chronic and progressive condition characterized by degeneration of the optic nerve, which can be differentiated from other types of acquired optic neuropathy by the distinctive morphology of the optic nerve head. In glaucoma, there is a gradual thinning of the neuroretinal rim, leading to an increase in the size of the optic nerve cup, a process known as optic nerve cupping. This condition arises from the degeneration of retinal ganglion cell axons, along with the associated glial cells and blood vessels. Notably, the remaining neuroretinal rim usually maintains its typical pink hue. In contrast, other forms of optic neuropathy typically exhibit a loss of this pink coloration and do not present with cupping, with the exception of arteritic anterior ischemic optic neuropathy, where cupping may also be observed. Patients suffering from glaucoma often experience a decline in peripheral vision, and without appropriate intervention, they risk complete vision loss.[1-3]

In 2 previous color Doppler imaging (CDI) studies in patients with open-angle glaucoma conducted by their investigative group, they found an increase in blood flow velocity in the retrobulbar vessels and a decrease in the resistivity index (RI) in these vessels with dorzolamide added to timolol and with the fixed-dose combination of dorzolamide/ timolol.[4, 5] Hence; the present study was conducted for assessing 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 for assessing the efficacy of Dorzolamide 2 percent timolol 0.5 percent fixed combination therapy in patients of primary open angle glaucoma.A total of 20 patients of POAG were enrolled. Patients fulfilling the inclusion criteria and having none of the exclusion criteria were enrolled in the study after obtaining written informed consent. The data obtained was compiled on a proforma and appropriate tests will thus be applied.Fixed drug combination of Dorzolamide2%/ Timolol 0.5% (DTFC) dosed twice daily. Patients was then be called for follow up at 2ndweek, 4thweek and 6thweek during the study period and IOP was recorded. In both the groups, the eye that was affected was considered 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 analyzed by SPSS software. Univariate analysis was done for evaluation of level of significance.

RESULTS

Mean age of the patients was 61.3 years. 60 percent of the patients were males while the remaining were females. Mean IOP at baseline, at visit 1, visit 2, visit 3 and visit 4 was 29.7, 28.9, 19.1, 15.9 and 14.2 respectively. Significant results were obtained while comparing the mean IOP at different time intervals. Conjunctival hyperemia, eye irritation and taste perversion were seen in 20 percent, 5 percent and 5 percent of the patients respectively.

Table 1: Comparison of Mean IOP of Both Groups

Visit	Mean	SD	p-value
Baseline	29.7	1.92	0.001 (Significant)
Visit 1	28.9	1.81	
Visit 2	19.1	1.68	
Visit 3	15.9	1.43	
Visit 4	14.2	1.28	

Graph 1: Comparison of Mean IOP of Both Groups

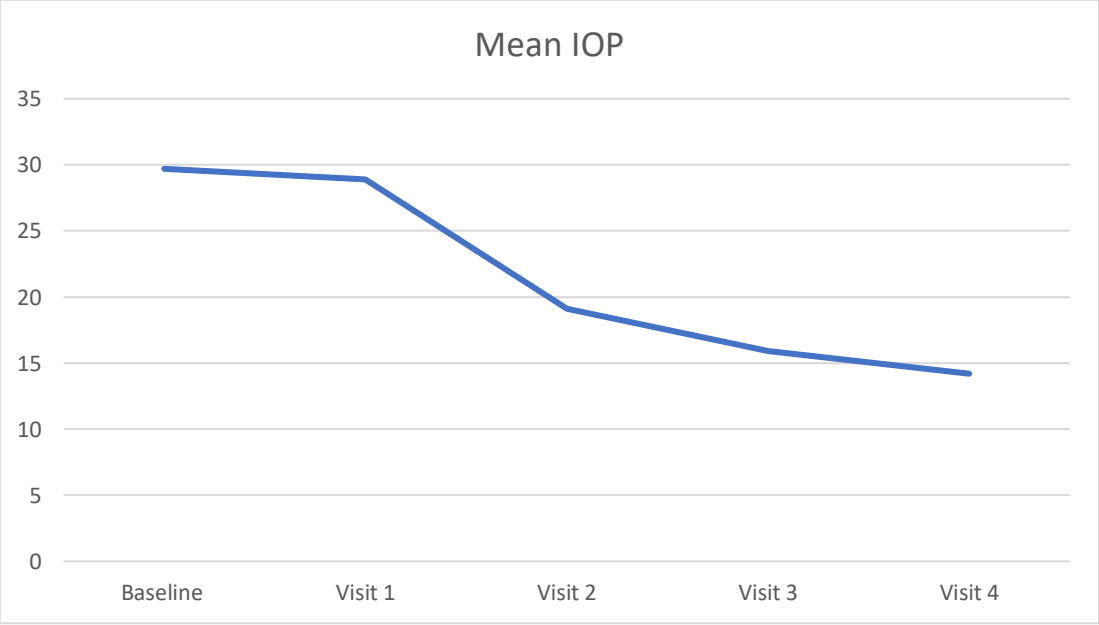

Table 2: Side effects

Adverse effects	Number	Percentage
Conjunctival Hyperemia	4	20
Eye Irritation	1	5
Taste Perversion	1	5

DISCUSSION

Glaucoma is a multifaceted optic neuropathy marked by increased intraocular pressure (IOP), which is a critical risk factor for the condition. The elevation of IOP can lead to characteristic damage to the optic nerve, which is associated with glaucoma, resulting in specific deficits in visual fields. As one of the primary causes of blindness worldwide, it is essential to undertake prompt interventions to prevent further vision loss. Research demonstrates that lowering IOP

can significantly reduce the risk of glaucoma progression. Furthermore, fluctuations in IOP levels during monitoring are linked to either an increased or decreased risk of disease advancement, a relationship that holds true for both patients with ocular hypertension and those with normal tension glaucoma.[6, 7]

Timolol is a non-selective beta-adrenergic antagonist. Reducing aqueous humor flow is the main mechanism by which beta blockers like timolol have been shown to lower IOP. Timolol presumably exerts a direct action on the beta-2 adrenergic receptors in the ciliary processes to decrease aqueous humor secretion and possibly on local capillary perfusion to reduce ultrafiltration. Reduction of aqueous humor production may be secondary to inhibition of catecholamine-stimulated synthesis of cyclic adenosine monophosphate (AMP) in ciliary epithelium, which has been demonstrated in rabbit studies. However, the regulation of aqueous humor dynamics is complex and still not fully understood.[7- 9]

Mean age of the patients was 61.3 years. 60 percent of the patients were males while the remaining were females. Mean IOP at baseline, at visit 1, visit 2, visit 3 and visit 4 was 29.7, 28.9, 19.1, 15.9 and 14.2 respectively. Martínez A et al conducted a study to evaluate the long-term impacts of administering dorzolamide 2% twice daily in conjunction with timolol maleate 0.5% twice daily on intraocular pressure (IOP), retrobulbar blood flow, and the advancement of visual field impairment in individuals diagnosed with primary open-angle glaucoma. The average age of participants was 68.0 years, with all subjects being white and 21 (52.5%) identified as male. The mean baseline IOP recorded was 19.18 mm Hg for the study eyes and 18.23 mm Hg for the control eyes. The combination therapy of dorzolamide and timolol resulted in notable increases from baseline in end-diastolic velocity within the ophthalmic and short posterior ciliary arteries, alongside significant reductions in the resistivity index for both arterial structures. Among the 80 eyes examined, 23 exhibited progression of visual field damage, comprising 7 eyes from the study group and 16 from the control group. Kaplan-Meier survival analysis indicated that the likelihood of progression was significantly reduced in the eyes receiving the combination treatment of dorzolamide and timolol compared to those treated with timolol alone. The mean changes in IOP from baseline to the 48-month mark were recorded as a decrease of 1.10 mm Hg in the dorzolamide and timolol group, contrasted with an increase of 1.27 mm Hg in the control group.[10]

In the present study, significant results were obtained while comparing the mean IOP at different time intervals. Conjunctival hyperemia, eye irritation and taste perversion were seen in 20 percent, 5 percent and 5 percent of the patients respectively. Teus MA et al conducted a comparative study on the efficacy of two fixed combinations for lowering intraocular pressure (IOP) in patients diagnosed with ocular hypertension or open-angle glaucoma. A total of 319 eligible participants were assigned to receive either travoprost 0.004%/timolol 0.5% once daily in the morning (n = 157) or dorzolamide 2%/timolol 0.5% twice daily (n = 162). IOP measurements were taken in the morning and evening at both 2 and 6 weeks post-treatment initiation. Initial mean IOP levels were comparable across both treatment groups. The results indicated that the mean pooled diurnal IOP was significantly lower in the travoprost/timolol group compared to the dorzolamide/timolol group. Specifically, at the 9 AM measurement, the travoprost/timolol combination showed significantly reduced mean IOP values at both Week 2 and Week 6. The travoprost/timolol regimen achieved mean IOP reductions from baseline ranging from 35.3% to 38.5%, whereas the dorzolamide/timolol regimen resulted in reductions from baseline of 32.5% to 34.5%. Thus, the fixed combination of travoprost 0.004%/timolol 0.5%, administered once daily in the morning, exhibited superior efficacy in lowering mean diurnal IOP compared to the dorzolamide 2%/timolol 0.5% combination, which was administered twice daily in patients with ocular hypertension or open-angle glaucoma.[11]

CONCLUSION

Dorzolamide/timolol represents a well-tolerated and efficacious fixed combination therapy for the reduction of intraocular pressure (IOP) in patients with open-angle glaucoma. This formulation is particularly beneficial for individuals who do not achieve sufficient control with first-line monotherapy.

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