ORIGINAL RESEARCH

A comparative analysis of Latanoprostene Bunod and Timolol Maleateophthalmic solutions in open-angle glaucoma

Dr. Maheshwari Chintan Manharlal

Assistant Professor, Department of Ophthalmology, NRI Medical College & General Hospital, Guntur, Andhra Pradesh, India

Corresponding author
Dr. Maheshwari Chintan Manharlal
Assistant Professor, Department of Ophthalmology, NRI Medical College & General Hospital, Guntur, Andhra Pradesh, India

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ABSTRACT
Background: The present study compared Latanoprostene Bunod, and 0.5% timolol solutions in lowering intraocular pressure in open-angle glaucoma. **Materials & Methods:** 50 patients of open-angle glaucoma of both genders were divided into 2 groups of 25each. In group I, patients were prescribed latanoprostand in group II, patients were prescribed timolol maleate. IOP was measured using a topical proparacaine 0.5% as the local anesthetic. Blood pressure and heart rate were measured immediately before IOP measurements. **Results:** Group I had 15 males and 10 females, group II had 12 males and 13 females. The mean IOP was 25.8 mm Hg in group I, and 24.6 mm Hg in group II. Heart rate was 78.4 bpm in group I, and in group II was in 77.2 bpm. The difference was non- significant (P> 0.05). Adverse events were dry eyes seen in 3, and 2, eye pain in 1 and 3, conjunctival hyperemia in 1, and 0, foreign body sensation in eyes in 1, and 0, and eye irritation in 2, and 1 in group I, and in group II respectively. The difference was non- significant (P> 0.05). **Conclusion:** In patients with open-angle glaucoma, latanoprostenebunod was superior to timolol in lowering intraocular pressure.
Keywords: Conjunctival hyperemia, Open-angle glaucoma, systemic hypertension

INTRODUCTION

The most prevalent type of the condition globally, especially in Western and African nations, is primary open angle glaucoma. POAG is a progressive optic neuropathy that can occur with or without raised intraocular pressure (IOP) and is characterized by ganglion cell loss and vision field degeneration in eyes with gonioscopically open angles.[1] POAG's pathophysiology is unknown. IOP, ocular perfusion pressure, ocular blood flow, myopia, central corneal thickness, and optic disc hemorrhages are among the several ocular risk factors that have been proposed.[2] Age, smoking, African heritage, family history, genetics, low blood pressure (BP), especially at night, atherosclerosis, lipid dysregulation, type 2 diabetes mellitus (DM), glucose intolerance, obesity, vasospasm, migraine, Raynaud syndrome, stress, and primary vascular dysregulation are examples of systemic risk factors.[3]

Several studies have revealed a significant role of the myocilin, optineurin, and cytochrome CYP1B1 genes in glaucoma development. Moreover, genome-wide association studies have shown associations of sequence variants.[4] The present study compared LatanoprosteneBunod, and 0.5% timololsolutions in lowering intraocular pressure in open-angle glaucoma.

MATERIALS & METHODS

The present study comprised of 50 patients of open-angle glaucoma of both genders. All were informed regarding the study and their written consent was obtained.

Data related to patients was recorded. They were allocated to 2 groups of 25 each. In group I, patients were prescribed latanoprostand in group II, patients were prescribed timolol maleate. IOP was measured using a topical proparacaine 0.5% as the local anesthetic. Blood pressure and heart rate were measured immediately before IOP measurements. Results were assessed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	0.005% latanoprost	0.5% timolol
M:F	15:10	12:13

Table I shows that group I had 15 males and 10 females, group II had 12 males and 13 females.

Table II Comparison of parameters

Parameters	Group I	Group II	P value
IOP (mm Hg)	25.8	24.6	0.12
Heart rate (bpm)	78.4	77.2	0.54

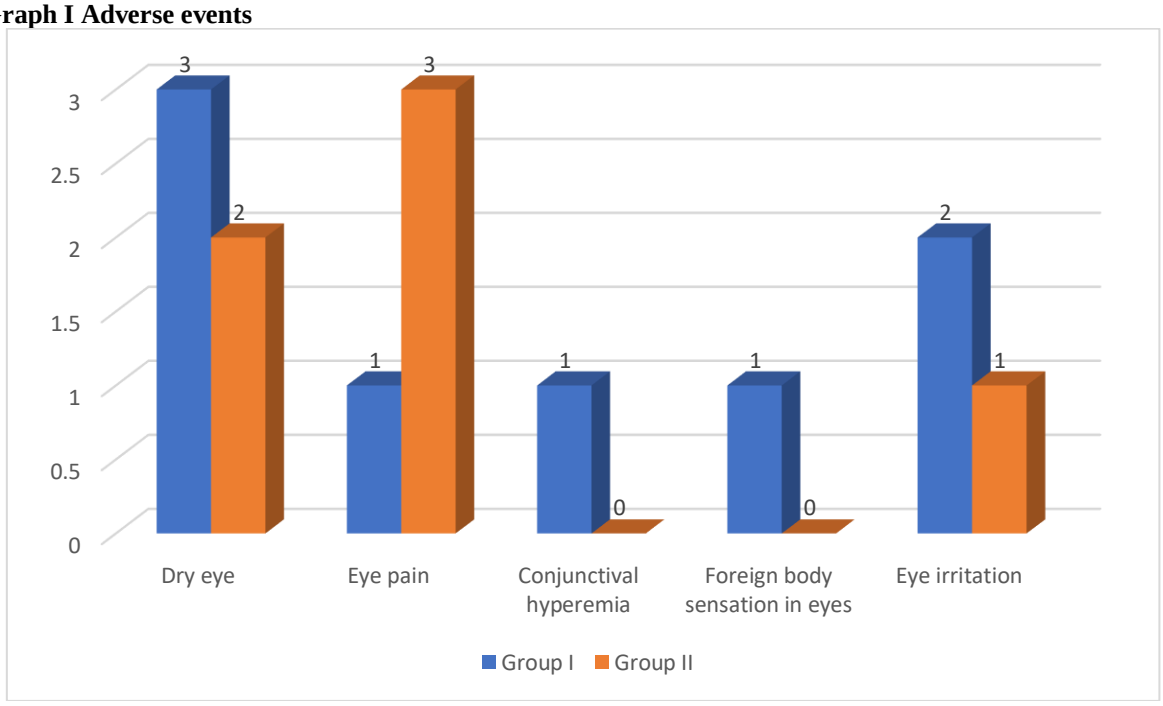
Table II shows that mean IOP was 25.8 mm Hg in group I, and 24.6 mm Hg in group II. Heart rate was 78.4 bpm in group I, and in group II was in 77.2 bpm. The difference was non- significant (P> 0.05).

Table III Adverse events

Adverse events	Group I	Group II	P value
Dry eye	3	2	0.87
Eye pain	1	3	0.05
Conjunctival hyperemia	1	0	0.14
Foreign body sensation in eyes	1	0	0.97
Eye irritation	2	1	0.75

Table III, graph I shows that adverse events were dry eyes seen in 3, and 2, , eye pain in 1 and 3, conjunctival hyperemia in 1, and 0, foreign body sensation in eyes in 1, and 0, and eye irritation in 2, and 1 in group I, and in group II respectively. The difference was non- significant (P> 0.05).

Graph I Adverse events



DISCUSSION

Globally, glaucoma ranks as the third most common cause of irreversible blindness. Permanent blindness can result from open-angle glaucoma. Glaucoma is caused by elevated intraocular pressure (IOP), and the majority of treatments aim to lower IOP. By the end of 2020, it is estimated that 80 million people worldwide will have glaucoma, with 11 million of them being bilaterally blind. In high-income nations, half of glaucoma patients are ignorant of their condition; in low-income nations, especially in rural areas, this percentage is over 90%.[5]

Numerous investigations have demonstrated the important function of the cytochrome CYP1B1 gene, myocilin, and optineurin in the development of glaucoma.[6,7] The ultimate objective of treating glaucoma is to reduce the disease's progression to a point where the patient's quality of life won't decline due to vision problems.[8] Clinical, laser, and surgical methods should be taken into consideration while treating glaucoma in poor nations. 8. In addition to not

improving vision, glaucoma drugs can have serious adverse effects and can be somewhat costly. Compliance, which is correlated with the patient's socioeconomic situation and educational attainment, can therefore be a significant problem.[9]The present study compared LatanoprosteneBunod, and 0.5% timolol solutions in lowering intraocular pressure in open-angle glaucoma.

We found that group I had 15 males and 10 females, group II had 12 males and 13 females.In order to determine whether increasing the concentration to 0.5% timolol 4% pilocarpine would further reduce intraocular pressure in patients whose intraocular pressure was higher than 21 mm Hg while taking 0.5% timolol-2% pilocarpine, Puustjärvi et al[10] first examined the effectiveness of this medication. Over the course of 48 weeks, the 228 patients in the group underwent the exams. Intraocular pressure decreased on average from 24.7 +/- 2.8 to 21.0 +/- 3.8 mm Hg. After the eighth week of the trial, almost one-third of the patients needed their concentrations to be increased to 0.5% timolol-4% pilocarpine. Another 2.2 mm Hg drop in intraocular pressure was noted at week 12 in patients on 0.5% timolol-4% pilocarpine.

We found that mean IOP was 25.8 mm Hg in group I, and 24.6 mm Hg in group II. Heart rate was 78.4 bpm in group I, and in group II was in 77.2 bpm. BonovasS et al[11] found that the risk of glaucoma increased by 5% for each year since diabetes diagnosis; their pooled analysis presented a 0.18 mmHg difference between IOP in patients with diabetes, compared to those without diabetes.

We found that adverse events were dry eyes seen in 3, and 2, eye pain in 1 and 3, conjunctival hyperemia in 1, and 0, foreign body sensation in eyes in 1, and 0, and eye irritation in 2, and 1 in group I, and in group II respectively. In a randomized prospective experiment, Dallas et al[12]treated 92 eyes with newly diagnosed chronic open angle glaucoma (COAG) with either pilocarpine or timolol. For two years, their visual field survival was tracked using both Goldmann and Friedmann perimetry every three months. Using applanation, concurrent tonometric data was obtained. Algorithms created to provide the highest sensitivity for glaucomatous field loss were used to evaluate and quantify the fields. The data was collected and analyzed using microcomputer programs created especially for this purpose. According to the analysis, timolol medication may be linked to a brief improvement in Friedmann field scores. Throughout the first year of treatment, the timolol-treated group continued to have this effect, which seemed to start during the first three months of therapy. However, the Friedmann field scores of the Pilocarpine-treated group immediately and continuously decreased linearly. Three eyes on timolol (9%) demonstrated continuous trends of notable central field improvement, while 59% exhibited no discernible rate of change.

The limitation of the study is small sample size.

CONCLUSION

Authors found that in patients with open-angle glaucoma, latanoprostenebunod was superior to timolol in lowering intraocular pressure.

REFERENCES

1. Castro AN, Mesquita WA. Não-adesão à terapêutica medicamentosa do glaucoma [Noncompliance with drug therapy for glaucoma]. Arq Bras Oftalmol. 2008;71(2):207-14.
2. Krauss AH, Impagnatiello F, Toris CB, Gale DC, Prasanna G, Borghi V, et al. Ocular hypotensive activity of BOL-303259-X, a nitric oxide donating prostaglandin F2a agonist, in preclinical models. Exp Eye Res. 2011; 93(3):250-5.
3. Dielemans I., de Jong P.T., Stolk R., Vingerling J.R., Grobbee D.E., Hofman A. Primary open-angle glaucoma, intraocular pressure, and diabetes mellitus in the general elderly population. The Rotterdam Study. Ophthalmology. 1996;103:1271–1275.
4. Klein B.E., Klein R., Meuer S.M., Goetz L.A. Migraine headache and its association with open-angle glaucoma: The Beaver Dam Eye Study. Investig. Ophthalmol. Vis. Sci. 1993;34:3024–3027.
5. Bonomi L., Marchini G., Marraffa M., Bernardi P., Morbio R., Varotto A. Vascular risk factors for primary open angle glaucoma: The Egna-Neumarkt Study. Ophthalmology. 2000;107:1287–1293.
6. Leite MT, Sakata LM, Medeiros FA. Managing Glaucoma in Developing Countries. Arq Bras Oftalmol. 2011;74(2):83-84.
7. Friedman DS, Okeke CO, Jampel HD, Ying GS, Plyler RJ, Jiang Y, et al. Risk factors for poor adherence to eyedrops in electronically monitored patients with glaucoma. Ophthalmology. 2009;116(6):1097-105.
8. Tielsch J.M., Katz J., Quigley H.A., Javitt J.C., Sommer A. Diabetes, intraocular pressure, and primary open-angle glaucoma in the Baltimore Eye Survey. Ophthalmology. 1995;102:48–53.
9. Tielsch J.M., Sommer A., Katz J., Royall R.M., Quigley H.A., Javitt J. Racial variations in the prevalence of primary open-angle glaucoma. The Baltimore Eye Survey. JAMA. 1991;266:369–374
10. Puustjärvi TJ, Repo LP. Timolol-pilocarpine fixed-ratio combinations in the treatment of chronic open angle glaucoma: a controlled multi-center study of 48 weeks. Archives of ophthalmology. 1992 Dec 1;110(12):1725-9.
11. Bonovas S., Peponis V., Filioussi K. Diabetes mellitus as a risk factor for primary open-angle glaucoma: A meta-analysis. Diabet. Med. 2004;21:609–614.
12. Dallas NL, Sponsel WE, Hobley AJ. A comparative evaluation of timolol maleate and pilocarpine in the treatment of chronic open angle glaucoma. Eye. 1988 May;2(3):243-9.