(e) ISSN Online: 2321-9599
(p) ISSN Print: 2348-6805
SJIF (Impact factor) 2017= 6.261
Index Copernicus value = 80.90

ORIGINAL ARTICLE

Latanoprostene Bunod, Timolol Maleate, and latanoprost ophthalmic solutions in open-angle glaucoma

Prashant Shukla

Associate Professor, Department of Ophthalmology, N.C.Medical College & Hospital, Israna, Panipat, Haryana, India

ABSTRACT:
Background: Primary open angle glaucoma (POAG) is the most common form of the disease worldwide. The present study compared LatanoprosteneBunod, Timolol Maleate, and latanoprost ophthalmic solutions in lowering intraocular pressure in open-angle glaucoma. **Materials & Methods:** 90 patients of open-angle glaucoma of both genderswere divided into 3 groups of 30 each. In group I, patients were prescribed latanoprost. In group II, patients receivedlatanoprostenebunod, and in group III, 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:** The mean IOP was 24.8 mm Hg in group I, 23.6 mm Hg in group II and 24.2 mm Hg in group III. Heart rate was 77.4 bpm in group I, 76.8 bpm in group II and 77.2 bpm in group III. The difference was non- significant (P> 0.05). Adverse events were conjunctival hyperemia in 2, 0 and 1, eye pain in 2, 1 and 1, foreign body sensation in eyes in 1, 1 and 0, dry eyes seen in 4, 4 and 3, eye irritation in 2, 2 and 1 in group I, group II and group III respectively. The difference was non- significant (P> 0.05). **Conclusion:** Latanoprostenebunod was more effective than latanoprost and timololin reducing IOP in patients with open-angle glaucoma.
Key words: Conjunctival hyperemia, Open-angle glaucoma, systemic hypertension

Corresponding author: Prashant Shukla, Associate Professor, Department of Ophthalmology, N.C.Medical College & Hospital, Israna, Panipat, Haryana, India

This article may be cited as: Shukla P. Latanoprostene Bunod, Timolol Maleate, and latanoprost ophthalmic solutions in open-angle glaucoma. J Adv Med Dent Scie Res 2017;5(12):160-162.

INTRODUCTION

Primary open angle glaucoma (POAG) is the most common form of the disease worldwide, particularly in Africa and in the Western countries.[1] POAG is defined as a progressive optic neuropathy with loss of ganglion cells and visual field deterioration in eyes with gonioscopically open angles, with or without elevated intraocular pressure (IOP).[2]

The pathogenesis of POAG is unclear. Multiple ocular risk factors have been proposed, including IOP, ocular perfusion pressure, ocular blood flow, myopia, central corneal thickness, and optic disc hemorrhages.[3] Systemic risk factors include age, smoking, African ancestry, family history, genetic factors, systemic hypertension (HTN), low blood pressure (BP) (particularly a nocturnal drop in BP), atherosclerosis, lipid dysregulation, type 2 diabetes mellitus (DM), glucose intolerance, obesity, vasospasm, migraine, Raynaud syndrome, stress, and primary vascular dysregulation.[4]

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.[5]The present study compared LatanoprosteneBunod, Timolol Maleate, and latanoprost ophthalmic solutions in lowering intraocular pressure inopen-angle glaucoma.

MATERIALS & METHODS

The present study comprised of 90 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 3 groups of 30 each. In group I, patients were prescribed latanoprost. In group II, patients received latanoprostenebunod, and in group III, 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	Group III
Method	0.005% latanoprost	0.0024% latanoprostenebunod	0.5% timolol
M:F	20:10	16:14	17:13

Table I shows that group I had 20 males and 10 females, group II had 16 males and 14 females and group III had 17 males and 13 females.

Table II Comparison of parameters

Parameters	Group I	Group II	Group III	P value
IOP (mm Hg)	24.8	23.6	24.2	0.72
Heart rate (bpm)	77.4	76.8	77.2	0.18

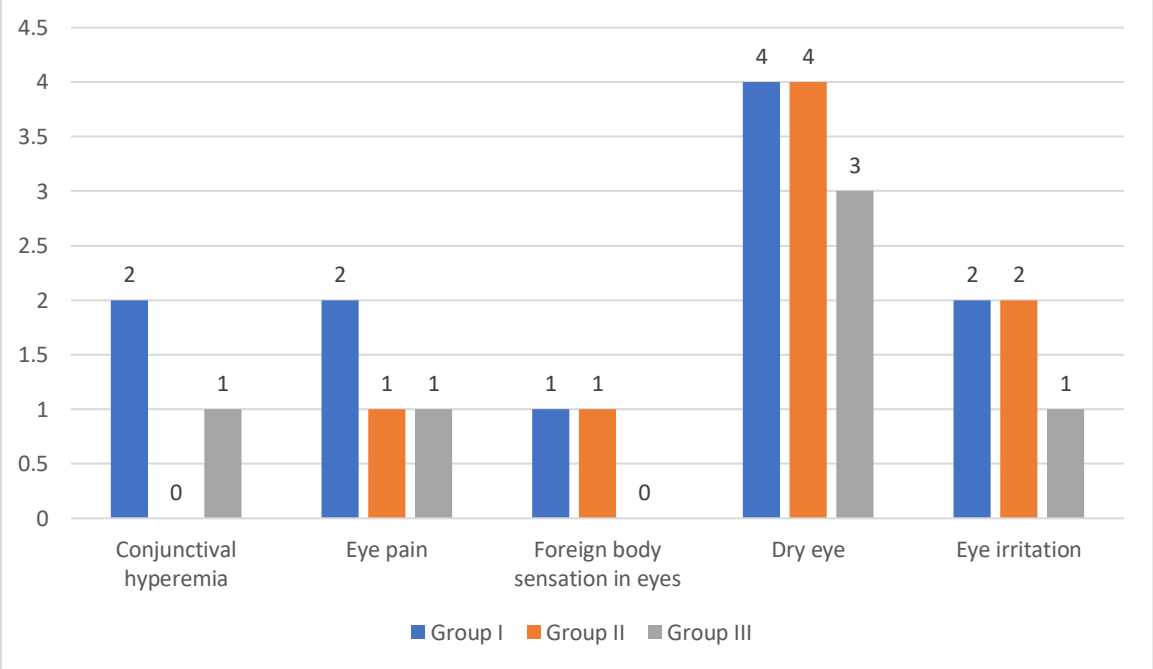
Table IIshows that mean IOP was 24.8 mm Hg in group I, 23.6 mm Hg in group II and 24.2 mm Hg in group III. Heart rate was 77.4 bpm in group I, 76.8 bpm in group II and 77.2 bpm in group III. The difference was non-significant (P> 0.05).

Table III Adverse events

Adverse events	Group I	Group II	Group III	P value
Conjunctival hyperemia	2	0	1	0.81
Eye pain	2	1	1	0.94
Foreign body sensation in eyes	1	1	0	0.97
Dry eye	4	4	3	0.09
Eye irritation	2	2	1	0.08

Table III, graph I shows that adverse eventswere conjunctival hyperemia in 2, 0 and 1, eye pain in 2, 1 and 1, foreign body sensation in eyes in 1, 1 and 0, dry eyes seen in 4, 4 and 3, eye irritation in 2, 2 and 1in group I, group II and group IIIrespectively. The difference was non- significant (P> 0.05).

Graph I Adverse events



DISCUSSION

Glaucoma is the third leading cause of irreversible blindness worldwide. Open-angle glaucoma may lead to permanent blindness. Elevated intraocular pressure (IOP) is responsible for glaucoma, and most treatments are designed to reduce IOP. Worldwide, approximately 80 million people have been predicted to have glaucoma by the end of 2020, with 11 million being bilaterally blind. While half of the population with glaucoma in high-income countries is unaware of their disease, this figure is over 90% in low-income countries, particularly in the rural settings.[6]

Several studies have revealed a significant role of the myocilin, optineurin, and cytochrome CYP1B1 genes in glaucoma development.[7]The ultimate goal of glaucoma treatment is to slow down disease progression to a rate in which the patient will not experience a vision-related decrease in quality of life. Glaucoma treatment in developing countries should consider clinical, laser, and surgical approaches.[8] Glaucoma medications do not improve vision, may have important side effects, and are relatively expensive. Thus, compliance can be a major issue, which is related to the level of education and socio-economic status of the patient.[9]The present study compared LatanoprosteneBunod, Timolol Maleate, and latanoprost ophthalmic solutions in lowering intraocular pressure inopen-angle glaucoma.

We found that mean IOP was 24.8 mm Hg in group I, 23.6 mm Hg in group II and 24.2 mm Hg in group III. Heart rate was 77.4 bpm in group I, 76.8 bpm in group II and 77.2 bpm in group III. Dallas et al[10]in their study 92 eyes with newly-diagnosed chronic open angle glaucoma (COAG) were treated in a

randomised prospective trial with either timolol or pilocarpine. Their visual field survival was monitored on a 3-monthly basis over 2 years using both Goldmann and Friedmann perimetry. Concomitant tonometric data was derived by applanation. Fields were assessed and quantified using algorithms designed to give the greatest sensitivity for glaucomatous field loss. Microcomputer programmes specifically designed for this purpose were used in the data collection and subsequent analysis.The analysis suggests an association between a transient period of Friedmann field score improvement and timolol therapy. This effect appeared to develop during the first three months of therapy, and was sustained in the timolol-treated population over the first year of treatment. The Pilocarpine-treated group, however, showed an immediate and sustained linear downward progression in Friedmann field scores. Fifty-nine per cent showed no significant rate of change, and three eyes on timolol (9%) showed ongoing trends of significant central field improvement.

We found that adverse events were conjunctival hyperemia in 2, 0 and 1, eye pain in 2, 1 and 1, foreign body sensation in eyes in 1, 1 and 0, dry eyes seen in 4, 4 and 3, eye irritation in 2, 2 and 1 in group I, group II and group III respectively. 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.

Puustjärviet al[12]investigated the efficacy of 0.5% timolol-2% pilocarpine, and second, to see to what extent an increase in concentration to 0.5% timolol4% pilocarpine would further lower intraocular pressure in those patients with an intraocular pressure of greater than 21 mm Hg while taking 0.5% timolol-2% pilocarpine. The cohort of 228 patients went through the examinations for a total of 48 weeks. A mean decrease in intraocular pressure from 24.7 +/- 2.8 to 21.0 +/- 3.8 mm Hg was observed. During the trial, approximately 33% of the patients required an increase in concentration to 0.5% timolol-4% pilocarpine after the week 8 examination. At week 12, in those using 0.5% timolol-4% pilocarpine, an additional 2.2 mm Hg lowering of intraocular pressure was observed. Side effects were minor and temporary and did not necessitate withdrawal from the study.

CONCLUSION

Authors found that latanoprostenebunod was more effectivethan latanoprost and timololin reducing IOP in patients with open-angle glaucoma.

REFERENCES

1. Leite MT, Sakata LM, Medeiros FA. Managing Glaucoma in Developing Countries. Arq Bras Oftalmol. 2011;74(2):83-84.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
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. 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.
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. Puustjärvi TJ, Repo LP. Timolol-pilocarpine fixed-ratio combinations in the treatment of chronic open angle glaucoma: a controlled multicenter study of 48 weeks. Archives of ophthalmology. 1992 Dec 1;110(12):1725-9.