Original Article

Comparison of Efficacy and Tolerance of Travoprost With Latanoprost in Patients With Open Angle Glaucoma

Ejaz Latif, Soufia Farrukh, Zulfiqar Ali, Rizwan Gul

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See end of article for authors affiliations

Correspondence to:
Ejaz Latif.
5/A, Medical Colony,
Bahawalpur.

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Purpose: The purpose of this study is to compare the intraocular pressure lowering effects of prostaglandin analogues available in Pakistan namely Travoprost 0.004% (Travatan) and Latanoprost 0.005% (Xalatan) in patients with open angle glaucoma as a monotherapy. In addition, ocular side effects and patient tolerance will also be monitored.

Material and Methods: This randomized, prospective study was conducted over a period of 12 months and included sixty patients with open angle glaucoma divided into two treatment groups. One group received 0.004% Travoprost and the other 0.005% Latanoprost as monotherapy.

Result: We found that the efficacy of Travoprost 0.004% was almost equivalent to that of Latanoprost 0.005%, for lowering intraocular pressure. Ocular irritation was experienced by 86.66% of patients on Travoprost and 20% of patients on Latanoprost. Ocular hyperemia was observed in almost all patients in Travoprost group, out of these 18 had grade I, 7 had grade II and 3 patients had grade III ocular hyperemia. In Latanoprost group, 17 patients had grade I and 3 patients had grade II ocular hyperemia, none of the patients had grade III.

Conclusion: Both Travoprost and Latanoprost lowered intraocular pressure to almost the same extent. The usage of Travoprost was associated with significantly more ocular irritation and hyperemia.

Glaucoma is a group of ocular diseases characterized by progressive optic neuropathy and corresponding visual field loss as a result of ganglion cell loss. There are many risk factors and causes of glaucoma, but IOP is the only factor that can be modified at the present[1].

Three large phase III clinical trials with Latanoprost have been performed in Europe (Scandinavia & U.K) and the U.S.A[2-4]. In the Scandinavian and the U.S. studies Latanoprost was significantly more effective than Timolol. The IOP lowering activity of travoprost has been evaluated in the laser-induced ocular hypertensive monkey model[5], and the top of the dose-response curve was determined to be 0.004%[6]. On the basis of these analysis, prostaglandin analouges are now being used as primary therapy for open angle glaucoma.

Prostaglandin analouges lower intra-ocular pressure by increasing the uveoscleral outflow of aqueous humor[7]. Latanoprost is a phenyl-substituted prostaglandin analouge. Travoprost is a topical ocular isopropyl ester prodrug, that is rapidly hydrolyzed by esterases in the cornea to the biologically active, free acid. Travoprost acid has greater affinity for the prostaglandin F (FP) receptor than either PGF2α or Latanoprost.

The purpose of this study was to compare the intraocular pressure lowering effects of prostglandin analouge available in Pakistan namely Travoprost 0.004% (Travatan Alcon, USA) and the Latanoprost 0.005% (Xalatan Pfizer, USA) in patients with open angle glaucoma as a monotherapy. In addition, ocular side effects and patient tolerence was also monitered.

MATERIAL AND METHODS

Sixty patients were randomized to two treatment groups in an approximate 1:1 ratio. One group received travoprost 0.004% and the other group was treated with Latanoprost 0.005% as monotherapy with once daily dose at 5:00 pm.

Inclusion criteria: Patients included were of either sex and of any age who were diagnosed with open angle glaucoma (primary, pseudoexfoliative or pigmentary glaucoma). They were required to have IOP measurements of less than 35 mmHg at all times. They were also required to be off of all glaucoma medicines for atleast 3 weaks proir to entering the study group.

Exclusion criteria: Those cases were excluded who had intraocular pressure above 35mmHg, chronic or recurrent severe inflammatory eye disease, C/D ratio of more than 0.8, previous intraocular surgery or use of steroids or NSAID's.

Baseline data: It included ocular and medical history, visual acuity recording, slit lamp biomicroscopy, dilated fundus examination, recording C/D ratio, gonioscopy, visual field with automated perimetry, evaluation of ocular hyperemia, inflammatory cells and aqueous flare, intraocular pressure with Goldman applanation tonometer

Follow up visits were conducted after 2 weeks, 1 month, 3 months and 6 months of the start of therapy. Hyperemia was observed before the IOP measurement and was recorded as 0= none/trace; I=mild;II-moderate; III=severe. Intraocular pressure was measured with Goldman applanaton tonometer.

RESULTS

Sixty patients were randomized to .two treatment groups. The mean age for travoprost 0.004% group was 53.7±11.0 years and for Latanoprost 0.005% group was 54.0±13.3 years. The age range for Travoprost group was 35-88 years and for Latanoprost goup 22-90 years. There were no statistically significant differences between treatment groups for age distribution, sex or ocular diagnosis (Table 1).

There was no signigficant difference in the intraocular pressure lowering efficacy of travoprost 0.004% dosed once daily at 5:00 pm and Latanoprost 0.005% dosed once daily at 5:00 pm at all treatment visits (table 2). The intarocular pressure reduction from baseline reduced by travoprost 0.004% ranged from -6.6 to -14.0 mmHg. and for Latanoprost 0.005% from -6.0 to -13.6 mmHg.

Ocular irritation was experienced by 86.66% of patients included in Travoprost 0.004% treatment group and 20% of patients included in Latanoprost 0.005% treatment group (table 3). Ocular hyperemia was observed in 28 (93.3%) patients included in travoprost 0.004% treatment group, out of these 18 (60%) had grade I ocular hyperemia, 7 (23.3%) had grade II and 3 (10%) patients had grade III ocular hyperemia. In the Latanoprost 0.005% group 20 (66.7%) patients developed ocular hyperemia of which 17 (56.7%) patients had grade I and 3 (10%) patients had grade II ocular hyperemia, none of the patient suffered grade III ocular hyperemia (table 4). Three (10%) patients in the Travoprost 0.004% group had to be eventually taken off the drug due to severe ocular irritation and hyperemia. Visual field and optic disc were evaluated at baseline and at the end of study and no significant change in either was observed.

DISCUSSION

This study was designed to study the comparative effects of Latanoprost 0.005% and Travoprost 0.004% as primary monotherapy for open angle glaucoma. The results of this study show that both Latanoprost 0.005% and Travoprost 0.004% are equally effective in lowering intraocular pressure in all treatment visits in patients with open angle glaucoma. This is in concordance with other studies conducted in this regard[8-10]. Prostaglandin analouges are rapidly hydrolyzed to their active form in eye. Their concentration in aqueous humor peaks at 2 hours and declines over the next 24 hours. Systemically they are rapidly metabolized and have a plasma half life of about 17 minutes. These pharmacokinetics are almost ideal for an ocular drug. The intraocular pressure lowering effects of prostaglandin analouge is not only well maintained but an additional effect is seen after 2-4 weeks. This delayed effect may be due to the specific mechanism of action of prostaglandins, which increase uveoscleral outflow, and recent studies show that they induce changes in the extra-cellular matrix of the ciliary muscle of the eye[11]. These changes may facilitate aqueous humor outflow through the ciliary

muscle(uveoscleral route). This process might possibly not to be completed in 2 weeks, which would explain the additional decrease in IOP after some months of treatment with prostglandin analouges. An additional benefit is that monotherapy definitely improves patient compliance. Most of the patient prefer to switch to a new drug rather than add another drug.

Ocular side-efects most commonly seen were conjunctival hyperemia and ocular irritation. These effects were more common in the Travoprost 0.004% treatment group. In fact, three patients in this group complained of such ocular irritation that they had to be eventually taken off the drug. However, none of the patients in any treatment group showed an increased permeability of blood aqueous barrier and has no aqueous cells or flare were seen. The change in iris pigmentation, a well-documented effect of prostaglandin analouges is not prominent in our setting because of the darker colour of iris.

Table 1: Demographic comparison

		Travoprost 0.004% n (%)	Latanoprost 0.005% n (%)
Age	< 60 years	21 (70)	22 (73.3)
	> 60 years	9 (30)	8 (26.7)
Sex	Male	17 (56.7)	16 (53.3)
	Female	13 (43.3)	4 (46.7)
Diagnosis	Open angle glaucoma	27 (90)	26 (86.7)
	Pigmentary glaucoma	0	0
	Pseudoexfoliation glaucoma	3 (10)	4 (13.3)

Table 2: Intraocular pressure

	Baseline		2 weeks		1 month		3 months		6 months	
	Range	Median	Range	Median	Range	Median	Range	Median	Range	Median
Travoprost 0.004%	22-34	28	11-21	16.5	10-22	16	10-20	15	11-20	15.5
Latanoprost 0.005%	23-34	28	12-22	17	11-21	16.5	11-20	15.5	10-20	15

Table 3: Ocular irritation

Drug	No. of cases n (%)
Travoprost 0.004%	26 (86.7)
Latanoprost 0.005%	6 (20.0)

Table : Ocular hyperemia

Drug	Grade			
	0 n (%)	I n (%)	II n (%)	III n (%)
Travoprost 0.004%	2 (6.7)	18 (60)	7 (23.3)	3 (30)
Latanoprost 0.005%	10 (33.3)	17 (56.7)	3 (10)	0

CONCLUSION

In conclusion, we have found that the efficacy of 0.005% Latanoprost administered once daily at 5:00pm is almost as good as 0.004% Travoprost administered once daily. Travoprost tended to cause more hyperemia and ocular irritation. Both these drugs are now being widely used as primary monotherapy for open angle glaucoma.

Author's affiliation

Professor Ejaz Latif.
Head of Ophthalmology
Q.A.M.C.
Bahawalpur

Dr. Soufia Farrukh
Assisstant Professor
Department of Ophthalmology
Q.A.M.C, Bahawalpur

Dr. Zulfiqar Ali
Senior Registrar.Ophthalmology
B.V.H, Bahawalpur

Dr. Rizwan Gul
Department of Ophthalmology
B.V.H, Bahawalpur

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