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Original Research Article

A Comparative Study to Evaluate the Efficacy of Topical use of Travoprost Vs Timolol in Open Angle Glaucoma

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Abstract:

Introduction: This research evaluates the safety and effectiveness of the Glaucoma therapies Timolol and Travoprost in patients with Primary Open Angle Glaucoma or Ocular Hypertension. Timolol were assigned to thirty patients while Travoprost were assigned to thirty patients.

Methods: A total 60 patients enrolled in this study. They were divided in two groups, 30 patients in one group. These parameters studied in present study named as gender distribution, current complaints, hypertension, the laterality, age, visual acuity, cup disc ratio, intraocular pressure and side effects.

Results: A Travoprost cohort shows a higher incidence of hypertension (P=0.038), greater decrease in intraocular pressure with Travoprost versus Timolol (P<0.05), and a time dependent reduction of the cup to disc ratio with Travoprost (P<0.05).

Conclusion: Difference in age distribution, gender, side effects, laterality, and blood pressure have been observed between two groups. The Travoprost reduced intraocular pressure, cup to disc ration better than this drug, and may be a better therapy for management of glaucoma.

Keywords: Glaucoma, Timolol, Travoprost, Intraocular Pressure (IOP), Cup-to-Disc Ratio.

Introduction

OAG is a chronic disease where the optic nerve that connects the eye to the brain is damaged on a progressive basis. The effects of the nerve, if untreated, can lead to peripheral vision loss and lifelong blindness [1,2]. What you have to do the main thing is to lower pressure inside the eye (IOP). Doctors alone can control this pressure and prevent glaucoma from worsening further. As you can see, some of our physicians treat most glaucoma with certain eye drops that reduce the intraocular pressure [3]. Several such categories are included in these drops: The medications include beta blockers, carbonic anhydrase inhibitors, prostaglandin analogs, and alpha agonists [4]. On occasion, physicians decide it makes true to take more than one type of these eye drops in use at one time, rather than just one. Combining medications that work by different mechanisms may more effectively decrease intraocular pressure without adverse effects [5]. Literally, glaucoma refers to several distinct ocular disorders rather than a single disease entity. All of these disorders slowly damage the main optic nerve causing vision loss and possibly blindness unless treated [6]. Most of all (70%) is open angle glaucoma (OAG). Medically speaking, physicians manage it by following ocular drops to reduce intraocular pressure, the one thing that is effective in alleviating disease progression. Physicians use two prevalent therapies: timolol/brinzolamide, a combination of medications, and travoprost (a singular medication) [7]. The two drug matters in the combination medication both reduce intraocular pressure. It does this by reducing ocular fluid production and increasing drainage from fluid in the eye. Travoprost, the alternative medication, increases drainage of fluid from the eye [8,9]. When administered alone, each of these therapies works [10]. This data collection was undertaken at a single medical facility for 12 weeks [11].

Material and Methods

A methodology is a complete framework with systematic strategy for research. The major goal is to compile as much exact, dependable information as is possible by closely looking at very carefully

and employing logical judgment of what we observe. In this study, two eye drop drugs are compared in terms of their relative efficacy in treating open angle glaucoma, a disease that includes increased intraocular pressure. The research presented here was developed as a prospective analysis comparing the two therapies directly. The study had been conducted on patients reporting to the department of pharmacology and registering in the department of ophthalmology at BRD Medical College, Gorakhpur, after written informed consent had been obtained from either of the patients or their guardians.

We made sure that patient or caregiver understood what was being done and that they or their caregiver signed a consent form before every patient participating in our research. Research spanned one year allowing 12 months for data collecting and analyzing. We had to ensure that the number of participants in our study was good enough to make the results reliable. We anticipated attrition, and planned to enrol up to 60 individuals for this research. For research, we had meticulously selected the participants. Individuals, who voluntarily consented, completed permission forms, were at least 18 years of age, and diagnosed no greater than 3 months previously with primary open angle glaucoma were included. Everyone who participated in the study was given elevated intraocular pressure (greater than 20 mmHg) on at least two separate occasions and was not currently taking ocular medications. Additionally, they must have undergone considerable changes in their visual field, an open angle in their ocular anatomy on examination, had a good cup to disc ratio greater than 0.4, or a disparity larger than 0.2 in this measurement between their eyes. Therefore, we had to exclude some people from the research to make sure our findings would be true. Participation was limited to individuals who refused to sign the permission form or had an allergy for any of the medications being investigated. Individuals who actually used contact lenses were excluded as were individuals using other drugs that can also alter their intraocular pressure. Specificity of selection criteria ruled out extraneous variables, and any changes in ocular pressure were inevitably due to our research drugs. This approach permits a rigorous study of efficacy of each drug with scientific integrity in order to protect the patient. This allows us to have credible information about the most effective therapy for people with open angle glaucoma.

Results

Table 1: Gender Distributions among Study Groups (n=60)

Group	Female	Male	Total	P value
Timolol	19	11	30	0.020
Travoprost	10	20	30	
Total	29	31	60	

Table 1: Gender distribution shows roughly equal proportional representation of male and female in both the Timolol and The Travoprost group, though higher proportion of males receiving Travoprost treatment. A gender related preference or random variation of sample selection is suggested by the statistically significant difference in gender distribution (P=0.020).

Table 2: Present Complaint

Group	Blurred Vision	Eye Pain	Headache	Total	P value
Timolol	17	7	6	30	0.193
Travoprost	11	7	12	30	
Total	28	14	18	60	

Table 2: The main complaint among both groups is hazy vision, with no significant separation between the Timolol and Travoprost groups (P=0.193), i.e. no difference in discomfort associated with these therapies. Statistically the disparities in symptoms of ocular discomfort and headache are not significant.

Table 3: Laterality

Group	Left	Right	Total	P value
Timolol	13	17	30	1.000
Travoprost	13	17	30	
Total	26	34	60	

Table 3: Average percentage distributions of laterality for Timolol and Travoprost groups are same, with same amount (1:1) of left versus right eye cases. No significant disparity in laterality between the two treatment groups is indicated by a P value of 1.000.

Table 4: Age Distribution among Study Groups

Group	N	Mean	Std. Deviation	P value
Travoprost	30	37.60	11.019	1.000
Timolol	30	37.90	10.807	

Table 4: The age in participants in Travoprost and Timolol groups is almost the same (P=1.000) and no significant difference is found. The similarity in age distribution between the two groups suggests that the research results will not be much changed in this observation.

Table 5: Visual Acuity LOG MAR

	Group	N	Mean	Std. Deviation	P value
0 Week	Travoprost	30	.630	.0750	.718
	Timolol	30	.637	.0669	
2 Week	Travoprost	30	.630	.0750	.300
	Timolol	30	.650	.0731	
4 Week	Travoprost	30	.630	.0750	.132
	Timolol	30	.660	.0770	
8 Week	Travoprost	30	.633	.0844	.096
	Timolol	30	.670	.0837	

Table 5: Visual acuity (in LOG MAR) at baseline and throughout follow up is generally the same within the Travoprost and Timolol groups with no statistically significant change at the 0, 2, 4 or 8 week interval. The P values show that neither therapy had a statistically significant change in visual acuity with time.

Table 6: Cup-to-Disc Ratio (CDR)

	Group	N	Mean	Std. Deviation	P value
0 Week	Travoprost	30	.580	.1095	.000
	Timolol	30	.607	.0640	
2 Week	Travoprost	30	.580	.1095	.000
	Timolol	30	.633	.0547	
4 Week	Travoprost	30	.580	.1095	.003
	Timolol	30	.640	.0621	
8 Week	Travoprost	30	.580	.1095	.011
	Timolol	30	.643	.0679	

Table 6: The Cup to Disc Ratio (CDR) decreased significantly at 2, 4 and 8 weeks in the Travoprost group, compared to the Timolol group (P's of statistical significance, P<0.05). That means that when the CDR goes down over time, the reduction is greater with travoprost.

Table 7: IOP – Intraocular Pressure

	Group	N	Mean	Std. Deviation	P value
0 Week	Travoprost	30	28.77	3.266	.236
	Timolol	30	29.80	3.418	
2 Week	Travoprost	30	22.93	2.924	.002
	Timolol	30	25.33	2.783	
4 Week	Travoprost	30	18.30	1.932	.000
	Timolol	30	20.97	2.846	
8 Week	Travoprost	30	15.47	1.106	.000
	Timolol	30	17.63	2.059	

Table 7: As a result both groups significantly decreased IOP during the 8 week period, with a more pronounced reduction in intraocular pressure for Travoprost at all time points (P < 0.05). Therefore, Travoprost is found to be more efficient in decreasing IOP when compared to Timolol.

Table 8: Side effects

		Group		Total	P value
		Timolol	Travoprost		
Conjunctival hyperemia	No	27	25	52	0.706
	Yes	3	5	8	
Foreign body	No	10	23	33	0.001

sensation	Yes	20	7	27	
Blurred vision	No	10	26	36	0.000
	Yes	20	4	24	
Itching	No	15	24	39	0.015
	Yes	15	6	21	
Eyelashes changes	No	27	25	52	0.448
	Yes	3	5	8	
Dry eye	No	14	28	42	0.000
	Yes	16	2	18	

Table 8: Overall, the data indicate that Timolol is associated with a higher incidence of certain side effects compared to Travoprost, particularly foreign body sensation, blurred vision, itching, and dry eye.

Discussion

This research study examined two distinct kinds of eye drops for the treatment of primary open-angle glaucoma: Travoprost 0.004%, Timolol 0.5%. However, each kind of eye drop was carefully examined in terms of how well it treats the illness. Age was examined, and when combined with timolol, participants averaged 60.93 years (σ=9.87) and 58.30 years (σ=9.01) with travoprost. There was no substantial difference between these age groups. Findings from other researchers, Mehani R, Khan F and Babić N [12,14,15] confirmed their findings matched up with what we had observed. However, other studies reported ages as; Jeffrey A gave averages of 63.4 and 62.7 years, Giuffre I reported 69.52 years [16,17].

The majority of previous studies conducted by Mehani R, Khan F, and Parrish RK [12,14,18] used a greater number of male participants than female participants. Several controlled trials have demonstrated that reducing the pressure in the eye can reduce damage to the optic nerve and visual field and show that elevated intraocular pressure is a major risk factor for glaucoma.

In all, the efficacies of the timolol group increased markedly during the course of the first four weeks. Average decrease in their intraocular pressure was 6.6 mmHg. The findings matched previous work as reported, for instance, by Goldberg I, who found a pressure reduction of 6.3 to 7.9 mmHg, and Netland PA, who found heart pressure reduction of 4.7 to 7.1 mmHg. Similar findings were obtained by Fellman RL's investigation [19-21]. The travoprost cohort had better outcomes, reducing pressure by 8.07 mmHg over a four week period. These results matched the results of many other researchers, including Mehani R [12], Goldberg I, Netland PA, Cheng JW [19] and Deepankar [22, 23]. Efficacy with respect to reduction of intraocular pressure was consistently superior in the travoprost compared to the timolol cohort during the trial.

The main adverse event is conjunctival hyperemia, red eyes, affecting 8.33% of the patient population. In addition, in particular, 6.67% of those using timolol and 10% of those using travoprost were affected adversely. Several other adverse effects were noted, however infrequently: In one cohort, one individual (3.33%) had ocular discomfort; one participant using timolol reported ocular pain; and one individual using travoprost noted foreign body sensation in the eye. Other researchers too reported equal pattern of adverse consequences.

The study by Goldberg I found that 7% of those using timolol and 32.5% of those using travoprost had red swollen eyes [19]. Investigations by Netland PA, Fellman RL and Mehani R [20-22] also documented a comparable result, which suggests that these adverse are very consistent across myriad research trials.

Conclusion

The conclusion made in this study is that Timolol and Travoprost are efficacious treatments for both treating primary open angle glaucoma, seeing a significant decrease in intraocular pressure (IOP) as well as a reduction in Cup to Disc Ratio (CDR) over the 8 week period observed. Both medications were well tolerated, but Travoprost was more dramatic in IOP and CDR reduction and offered the possibility as a better therapeutic alternative compared to Timolol. There were no notable changes in gender distribution, age, laterality, or visual acuity between groups. Safety profiles of the therapies were not significantly different in conjunctival hyperemia. As a result, efficacy of Travoprost for reduction of intraocular pressure may be better than Timolol at equivalent safety.

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