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ORIGINAL ARTICLE

To Evaluate the Efficiency with which Patients who have had ND-YAG Laser Capsulotomy may Reduce their Intraocular Pressure with a Predetermined Dosage of Brimonidine/Tart-Rate [0.2%] and Timalol/Maleate [0.5%]

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ABSTRACT

Background: The most prevalent type of glaucoma, known as primary open-angle glaucoma (POAG), is a major contributor to preventable blindness worldwide. Treating hypertensive ocular diseases, such as elevated intraocular pressure (IOP), may decrease the development and progression of (POAG).

Objective: this study was to evaluate the efficiency with which patients who have had Nd-Yag laser capsulotomy may reduce their intraocular pressure with a predetermined dosage of brimonidine tartrate 0.2% and timalol maleate 0.5%

Method: From January 2022 to January 2023, a prospective, randomized trial was conducted in the Department of Ophthalmology at KMC and KTH Peshawar. Sample size 100 patients who had undergone (Nd-Yag-laser capsulotomy) were enrolled in the study. After random selection, 50 patients were divided into two groups. Group 1 received (timolol maleate) [0.5%] BID daily and Group 2 received [0.5%] (timolol maleate) in a constant proportion in addition to (0.2%) brimonidine tartrate BID daily. Intraocular pressure (IOP) was assessed at the beginning, after one week, three weeks, and four weeks. The mean IOP at 4 weeks served as the major outcome indicator. Mean IOP at 1 week, 3 week, and 4 week intervals were included as secondary end measures. Descriptive statistics, the Student's t-test, and one-way ANOVA were used to analyse the data.

Results: Mean IOP at baseline not significant with in two groups [P=0.36]. At one week, the mean IOP in the timolol group was 15.3 3.3 mmHg, compared to 13.1 2.9 mmHg in the timolol/brimonidine (P=0.001). At 3 weeks, (mean IOP) in the (timolol-group) was 14.4 3.1 mmHg, compared to 12.5 2.8 mmHg in the timolol/brimonidine group (p 0.001). At 4 weeks, the mean IOP in the timolol group was 13.8 3.1 mmHg, compared to 11.7 2.7 mmHg in the timolol/brimonidine group (p 0.001).

Conclusion: this study show that persons who have had Nd-Yag laser capsulotomy benefit from a blending together timolol maleate [0.5%] and brimonidine tartrate [0.2%] to significantly reduce intraocular pressure (IOP).

Keywords: Intraocular Pressure,ttimolol- maleate, brimoni-dine- tartrate, Nd-Yag Laser-Capsulotomy

INTRODUCTION

Glau-coma is a lead-ing cause of blind-ness world-wide, primary open-angle glaucoma (POAG). Elevated intraocular pressure (IOP) is a major risk factor for the development and progression of POAG, and therefore, it is important to control IOP in order to delay the onset and progression of the disease [1]. Nd-Yag laser capsulotomy is a non-invasive procedure used to treat patients with elevated IOP due to anterior chamber angle closure [2]. In this procedure, the anterior capsule of the eye is laser-ablated, which increases the outflow of aqueous humor, thus reducing IOP [3]. In an effort to reduce (IOP) patients whoever had Nd-Yag laser capsulotomy, this research compared comparison of (timolol-maleate) [0.5%] to (ttimolol- imaleate) [0.5%] and (brimonidine-tartrate) [0.2%] for treating hypertension [4].

METHODOLOGY

From January 2022 to January 2023, 100 patients who had undergone Nd-Yag laser capsulotomy participated in this prospective, randomized trial at the Ophthalmology Dept. at KMC and KTH in Peshawar. 50 patients each were divided into two groups by random selection. (timolol- maleate) [0.5%] was given B.I.D daily to Group 1 fixed dose of (timolol- maleate) [0.5%] and (brimonidine- tartrate) [0.2%] was administered BID daily to Group 2. IOP was assessed at the beginning, after one week, three weeks, and four weeks. The mean IOP at 4 weeks served as the major outcome indicator. Mean IOP at 1 week, 3 week, and 4 week intervals were included as secondary end measures. The data was analysed using qualitative statistics, the Student's t-test, and a one-way analysis variance.

RESULTS

The ImeanIIOP at bottom line was not significantly between two gro-ups (p=0.36). At one weeks, the mean IOP in the (timolol group) was 15.3 ± 3.3 mmHg, while in 2nd weeks the timolol/brimonidine group it was 13.1 ± 2.9 mmHg (p<0.001). At 4 weeks , the mean IOP in the (timolol group) was 14.4 ± 3.1 mmHg, while in the timolol/brimonidine group it was 12.5 ± 2.8 mmHg (p<0.001). At 4 weeks, the mean IOP in the (timolol group) was 13.8 ± 3.1 mmHg, while in the timolol/brimonidine group it was 11.7 ± 2.7 mmHg (p<0.001).

Table 1: Gender distribution

01.(timolol- maleate) [0.5%]	02.(timolol- maleate) [0.5%]	03.(brimonidine-tartrate) [0.2%]
Male	25	25
Female	25	25

Table 2: Intraocular Pressure Mean wise (mmHg) in Different Time Points

01.(timolol- maleate) [0.5%]	02.(timolol- maleate) [0.5%]	03.(brimonidine-tartrate) [0.2%]
Baseline	15.0 ± 2.5	15.5 ± 2.7
1 Weeks	15.3 ± 3.3	13.1 ± 2.9
3 Weeks	14.4 ± 3.1	12.5 ± 2.8
4 Weeks	13.8 ± 3.1	11.7 ± 2.7

Table 3: Mean Reduced Intraocular Pressure (mmHg)

01.(timolol- maleate) [0.5%]	02.(timolol- maleate) [0.5%]	03.(brimonidine-tartrate) [0.2%]
1 Weeks	-0.3 ± 3.3	-2.4 ± 2.9
3 Weeks	-0.6 ± 3.1	-3.0 ± 2.8
4 Weeks	-1.2 ± 3.1	-4.2 ± 2.7

Table 4: p-Values of Intraocular Pressure Reduction

01.(timolol- maleate) [0.5%]	02.(timolol- maleate) [0.5%]	03.(brimonidine-tartrate) [0.2%]
01. Weeks	0.75	<0.001
03.Weeks	0.45	<0.001
04.Weeks	0.02	<0.001

Table 5: Adverse Events

01.(timolol- maleate) [0.5%]	02.(timolol- maleate) [0.5%]	03.(brimonidine-tartrate) [0.2%]
Irritation in Eye	2	1
Headache	1	2
Dry Mouth	1	0

The study suggests that in individuals who have had Nd-Yag laser capsulotomy, IOP is significantly reduced more effectively by a fixed blending together brimonidine-tartrate [0.2%] and timolol-maleate [0.5%]. The [mean IOP] of the timolol-brimonidine group was significantly lower than that of the timolol group at all time points (p0.001).. At all time intervals, the timolol/brimonidine group's In comparison to the (timolol group), the mean IOP drop was greater (p 0.001). Adverse effects were mild and disappeared promptly in both groups.

DISCUSSION

After refractive errors, cataracts are the second-most frequent cause of avoidable blindness. [5]. Posterior capsular opacification places a significant financial and social strain on the patient. It also has an impact on everyday life by impairing vision and increasing glare [6]. Although several surgical procedures have been developed to slow the occurrence of PCO, no effective treatments have yet been found to stop its progression. Up to 50% of individuals who had posterior chamber cataract extraction had posterior capsular opacification[7]. IOL 7. Since the Nd-Yag laser's invention in 1981, its uses have multiplied dramatically across several medical specialties[8]. Due to its non-invasive methodology and outsides it is highly acknowledged in the care of PCO among surgeons and patients. Making a hole of 03–04 (mm) in the central portion the (posterior-lense- capsule) is the standard therapy for posterior capsular opacification.6 The preferred method of therapy is posterior capsulotomy with Nd-Yag laser[9]. A side effect of the Nd-Yag laser used to treat posterior capsular opacification is increased intraocular pressure. 5. 58-67% of patients who had Nd-Yag laser capsule-tomy exhibited an increase in IOP of at least (10 mm) . Studies have shown that despite reducing the quantity and intensity of laser blasts, they may still cause post-laser increased blood pressure[10]. No matter how many injections were administered, an increase in intraocular pressure and IOP was seen 2 hours after the procedure[11]. who had [Nd-Yag-laser-capsulotomy], findings of this research show that a fixed-combi-nation") (itimolol- imaleate) [0.5%] & (brimoni-dine- tart-rate) [0.2%] is much more effective than (timolol- maleate) [0.5%] alone in decreasing intraocular pressure[12]. This result is in line with other studies that have shown that the blending together these two medications reduces IOP in glaucoma patients more effectively than either medication alone. For individuals who need to fast and efficiently decrease their IOP, the blending together these two medications may be helpful. It is important to mention that the small sample size and brief follow-up duration of this research were limitations. Furthermore, since this research only included individuals who had received Nd-Yag laser capsulotomy, its findings cannot be applied to other glaucoma patients. To corroborate the findings of this study, more research with bigger sample numbers and longer follow-up times is required[13].

CONCLUSION

The findings of this research indicate that decreasing IOP in patients who have had Nd-Yag laser capsulotomy with a fixed-combi-nation of (timolol-male-ate) [0.5%] and (brimonidine-tartrate) [0.2%] is much more effective than (timolol- maleate) [0.5%] alone. These results could aid physicians in deciding on the best course of action for controlling IOP in glaucoma patients.

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