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Effect on IOP Following ND: YAG Laser Posterior Capsulotomy

Dr. Rakshan Reyaz [a], Dr. Asif Amin Vakil [b], Dr. Syed Sadaf Altaf [c]

[a] *Postgraduate, GMC Srinagar, J&K, India, 190010*

[b] *Associate Professor, GMC Srinagar, J&K, India, 190010*

[c] *Lecturer, GMC Srinagar, J&K, India, 190010*

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ABSTRACT:

Purpose: To study the effect on IOP following Nd: YAG Laser Posterior Capsulotomy.

Methods: In this prospective study, patients with PCO following a cataract surgery visiting Out Patient Department (OPD) of Government Medical College, Srinagar from September 2020 to September 2021 underwent Nd: YAG Laser Posterior Capsulotomy and were evaluated to study the IOP changes.

Results: 52 patients were evaluated. The mean age of patients was 59.5±8.16 years.. Males were 55.4% and females 44.6%. The mean pre-laser IOP level was 14.27 mmHg which increased to 16.48 mmHg after 1 week and decreased back to 14.73 mmHg after 6 months. The comparison between pre-laser and post-laser 6 months IOP levels was statistically insignificant.

Keywords: PCO, Nd: YAG Capsulotomy, IOP, Laser

1. INTRODUCTION:

Cataract is the major cause of blindness in India accounting for about 62.6% of all causes of blindness. Extracapsular cataract extraction (ECCE) with posterior chamber IOL implantation is the commonest ocular surgery performed to treat cataracts [1] . Posterior capsule opacification or "secondary cataract" or "after-cataract" is the most common long-term complication of cataract surgery. Decreased visual acuity, impaired contrast sensitivity, glare, monocular diplopia, and decreased cosmesis are the common complications secondary to posterior capsule opacification (PCO). Today Neodynium-YAG Laser Posterior Capsulotomy has become an established procedure for treating after cataracts [2,3]

Nd-Yag laser capsulotomy is a safe, non–invasive and effective treatment for PCO. Few of the reported complications of Nd: YAG laser posterior capsulotomy include retinal detachment, cystoid macular edema (CME), and rise in IOP. The mechanism for the increase in IOP post YAG capsulotomy is due to reduced outflow facility because of blockage of trabecular meshwork by the capsular debris and vitreous particles floating in the anterior chamber [4,5] .Kraff and co-authors have found that the IOP spike post capsulotomy is lower in pseudophakes compared to aphakes, as IOL would block the capsular and vitreal debris reaching the anterior chamber which blocks the trabecular meshwork [6]. Most ophthalmologists prescribe antiglaucoma medications for the first week post-procedure. The drugs preferred are α 2 adrenergic receptor agonists. Glaucoma patients need to be monitored more frequently.The primary goal of this study was to examine the influence of Nd:YAG laser capsulotomy IOP.

2. METHODOLOGY:

This was a hospital-based, prospective, study that was conducted over a period of one year. The study was undertaken after obtaining clearance from the Institutional Ethical Committee. Pseudophakic patients with PCO following uncomplicated cataract surgery, attending the Ophthalmology OutPatient Department at Government Medical College, Srinagar from September 2020 to September 2021 were randomly selected and included in the study. A total of 56 patients were included. The patients underwent visual acuity testing, slit lamp examination, pre-procedure refractive status checkup, fundus examination, and IOP measurement using an iCare tonometer. Post-procedure the IOP was evaluated 1 week and 6 months from the date of the laser. Data was analyzed using an SPSS program.

3. RESULTS:

A total of 56 patients who attended the Eye OPD of GMC Srinagar from September 2020 to September 2021 were enrolled in the study and evaluated. The mean age of the patients was 59.5±8.16 years.

The study patients were between 42-72 years of age. Table 1 shows the age distribution of the study patients.

Table 1: Age distribution of study patients		
Age (Years)	**Number**	**Percentage**
41-50	9	16.1
51-60	19	33.9
61-70	26	46.4
> 70	2	3.6
Total	56	100
Mean±SD (Range)=59.5±8.16 (42-72 Years)		

55.4% of the patients were males, while as 44.6% of the patients were females. Table 2 shows the gender distribution of the study patients.

Table 2: Gender distribution of study patients		
Gender	**Number**	**Percentage**
Male	31	55.4
Female	25	44.6
Total	56	100

The mean pre-laser IOP level is 14.27 mmHg which increased to 16.48 mmHg after 1 week and decreased back to 14.73 mmHg after 6 months. The comparison between pre-laser and post-laser 6 months IOP levels is statistically insignificant (Table 3).

Table 3:Intraocular pressure (mmHg) before and after Nd: YAG Capsulotomy laser in study eyes					
Time Interval	**No. of patients**	**Mean (mmHg)**	**SD**	**Comparison**	**P-value**
Pre-laser	56	14.27	2.44	Pre-laser vs Post-laser 1 Week	<0.001*
Post-laser 1 Week	56	16.48	2.19	Post-laser 1 Week vs Post-laser 6 Months	<0.001*
Post-laser 6 Months	56	14.73	1.32	Pre-laser vs Post-laser 6 Months	0.167

***Statistically Significant Difference (P-value<0.05)**

4. DISCUSSION:

The reported incidence of PCO is 20.7% at 2 years and 28.5% at 5 years after cataract surgery. It is the most frequent cause of diminished visual acuity after cataract surgery [7] .

56 patients who attended the Eye OPD of GMC Srinagar from September 2020 to September 2021 were enrolled in the study and evaluated. The mean age of the patients was 59.5±8.16 years. The study patients were between 42-72 years of age. 55.4% of the patients were males, while as 44.6% of the patients were females.

The most common complication following Nd: YAG laser posterior capsulotomy is increased IOP. In the absence of antiglaucoma medication prophylaxis, 59–67% of patients showed IOP increment of about 10 mm Hg following laser capsulotomy. Despite the prophylactic treatment, increased IOP was reported in 15–30% of patients in several studies [8,9]. Ari et al divided their study population based on energy used; Group I ≤80 mJ, Group II >80 mJ. They observed that after a significant increase at 1 week postoperatively in both groups, IOP decreased to preoperative levels at 1 month in Group I. However, it remained at significantly high levels at 3 months postoperatively in Group II when compared to preoperative levels [10] .Holweger and Marefat concluded that there was no significant rise in IOP following laser [11]. Ozkurt et al also concluded that there was no significant change in IOP after Nd: Yag capsulotomy [12] Parajuli et al divided their study population into two groups based on energy used (Group I ≤50 mJ, Group II >50 mJ). They observed a statistically significant increase in IOP in both groups at 1 hr. IOP declined to preoperative levels at 1 month in Group I. Though the IOP at 1 month decreased significantly from 1 hr value, it remained significantly higher than the preoperative value in Group II [13] .In our study, following prophylactic post-laser treatment with Brimonidine (0.1%, TID) and Prednisolone (1%, QID) eyedrops, the mean pre-laser IOP level (14.27 mmHg) increased to 16.48 mmHg after 1 week and decreased back to 14.73 mmHg after 6 months. The comparison between pre-laser and post-laser 6 months' IOP levels was statistically insignificant. None of the patients required long-term antiglaucoma treatment.

CONCLUSION:

This study shows that Nd-Yag Laser Posterior Capsulotomy is a safe treatment for PCO following cataract surgery. Spikes in IOP following laser capsulotomy may be related to the debris created and the amount of energy delivered to the eye. Post-Laser use of antiglaucoma and anti-inflammatory medication reduces the chance of long-term glaucomatous sequalae.

CONFLICTS OF INTEREST:

None

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