



AN INTERVENTIONAL STUDY ON LENS INDUCE GLAUCOMA, ITS COMPLICATION, MANAGEMENT AND OUTCOME AT A TERTIARY EYE CARE INSTITUTE

Ophthalmology

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ABSTRACT

Purpose: To know the causes and modes of presentation to evolve better techniques and methodology of management of LIG. Further, to study complications preoperatively and postoperatively, also their effect on visual outcome finally. **Method:** It is an interventional study comprises 60 patients visiting our hospital, over a period of 12 months. Patients diagnosed as LIG are subjected to a detailed evaluation of their clinical condition, IOP, and visual acuity and are admitted for surgery (SICS with PCIOL implant) They are further followed up for 45 days postoperatively to evaluate their BCVA and IOP. **Results:** It is observed, 58% of LIG cases were found to be with phacomorphic glaucoma, 38% were phacolytic glaucoma the rest were with lens particle glaucoma and subluxation or dislocation 2% each. The most affected age group was 66-76 years (40%). Poor vision (6/60 or less) was obtained in about 40% of cases who delayed their visit to the hospital for a very long time with high IOP >41mmHg. Preoperative IOP was very high (41mmHg) and above in 54% of cases, moderately high (31-40mmHg) in about 40% of cases, and only, 6% of patients were found to have IOP <30mmHg. **Conclusion:** Our study indicated that the 56-75 years age group was most affected. The most important symptom which brought them to the hospital was pain followed by a gross diminution of vision. The cause of loss of vision was more with people who reported to the hospital too late and with sustained increased IOP for a longer duration.

KEYWORDS

Cataract, Glaucoma, LIG, Lens Induce Glaucoma

INTRODUCTION:

Lens pathogenesis is common to all of the secondary glaucoma in the Lens induce glaucoma (LIG) group. It can manifest as either an open angle mechanism (such as Phacolytic or Phacomorphic glaucoma) or an angle closure mechanism (such as Phacomorphic glaucoma).¹ According to the World Health Organization, 45 million people worldwide one of the most common causes of treatable blindness is cataract, which affects 17.6 million people (39 %) worldwide. The incidence of lens-induced glaucoma (LIG) is approximately 3.9%.² Patients are at an increased risk of developing LIG as a result of the delaying of cataract treatment.

Treatment for LIG focuses on removing the cataractous lens that is the cause. Due to increased IOP, irreversible damage to the retinal ganglion cells and optic nerve, increased surgical complications, and prolonged postoperative inflammation that delays recovery, the prognosis for good visual recovery in patients with LIG remains uncertain.³

The purpose of this assignment is to investigate the most typical modes of presentation, the various types of LIG, the intraoperative complications that occur during surgical procedures, the pre- and post-operative IOP, the visual outcome of LIG, and the management of the condition.

METHODOLOGY

The study includes fifty patients with lens-induced glaucoma who attended the department of ophthalmology and were found to have lens-induced glaucoma during study period (12 months). This was an interventional study. SICS+PCIOL under LA in the majority of cases after careful evaluation is the intervention.

The Institutional Ethical Committee granted ethical approval. Additionally, it includes evaluation of the visual outcome as well as the intraoperative and postoperative IOP. When selecting participants for the study, particular care was taken to exclude cases of primary glaucoma accompanied by cataract.

This study includes patients who have been identified as LIG based on their symptoms and signs. Pain, redness, photophobia, vision impairment, and the presence of cataract with an elevated IOP of more than 23 mmHg are clinical symptoms.

Detailed Evaluation Of All Participants:

50 patients were admitted following their initial clinical evaluation and comprehensive medical history. The duration and progression of the vision loss, the onset of pain, redness, watering, and photophobia in the affected eye, as well as associated symptoms like nausea and vomiting, were recorded in the details of the history. Any ocular trauma or eye

surgery history was inquired about. The affected eye's visual acuity was measured. On admission and discharge, the schiotz tonometer and rebound tonometer were used to measure the intraocular pressure. After lowering the pressure with intravenous mannitol, IOP was measured in corneal edema cases. Because the fundus was not visible, a B-Scan was performed in the affected eye. Other routine tests, like syringing the feces. A scan biometry and a blood pressure and sugar in the urine were recorded.

Pre-op Management:

Before surgery, the IOP was brought back to normal. The following medications were started: Inject 20% mannitol IV. 350 ml of infusion, 50 drops per minute for 30 minutes, Acetazolamide 500 mg orally as a tablet, a 50 mg tablet of domeperifone orally, dilation of the affected eye's pupil with tropicamide 0.08 percent and phenylephrine 5% in one drop every five minutes until the pupil expanded. Phenylephrine should not be used in cases of high blood pressure. One drop of flurbiprofen (0.03 percent) was given twice daily into the eyes to prevent intraoperative operative inflammation. Antibiotics before surgery: oral tablet of 500 mg ciprofloxacin every 12 hours was given. Additionally, one hourly application of moxifloxacin 0.5% topically to both eyes was recommended.

Surgical Management:

The procedure known as manual small incision cataract surgery (SICS) with a PCIOL implant was the one that is most frequently chosen. The technique of surgery involved. A fornix-based conjunctival flap was created, Crescent was used to create a sclerocorneal tunnel. At the 9 o'clock position, a side port was made. AC was formed by air and stained with trypan blue to identify good rhexisis. To prevent endothelial damage, blue wass removed and a viscoelastic substance was added. After entering the AC with keratome, rhexisis was performed using either the can opener technique or continuous curvilinear capsulotomy. After that, hydrodissection was performed. Using an IOL dialer, the nucleus was dialed to AC and delivered via wire-vectis. Constant irrigation and aspiration were used to extract the cortical matter. Once more, viscoelastic was used to form the AC, and an IOL was inserted into the capsular bag. The viscoelastic was removed once more with an AC wash, and the AC was reformed with air or ringer lactate. The wound was closed, and gentamycin and dexamethasone were injected into the subconjunctiva. Pad bandage was applied and the lid was closed.

Post-op Management:

The dressing was taken off the next morning, and the eye was examined with a slit lamp to check for postoperative complications. Ciprofloxacin 500 mg tablet and 250 mg acetazolamide tablet were continued in BD dose for 3 days. Moxifloxacin and steroid eye drops were administered regularly every hour under all hygienic conditions.

Patients were examined on days 1, 7, 14, 30, and 45 following surgery. The posterior segment evaluation, slit lamp examination, and BCVA were performed at each of these visits. Six weeks after surgery, refraction correction were performed. The chi-square test and probability values (p values) were utilized statistically.

RESULT:

The subjects were between the ages of 45 and 85, with a median age of 64. In comparison to postoperative readings, the minimum IOP was 28, the maximum was 68, and the median was 42.5. The median values of the IOP readings taken on the first, third, fourth, fifth, seventh, and fourteenth days, as well as the 42nd day, all indicated a gradual decline. The majority of the 50 patients in our study were elderly, between the ages of 66 and 75 (40 percent). The study's youngest case was 45 years old, and the oldest case was 85 years old.

Both male (50%) and female (50%) presentations were comparable in our study. As a result, there was no gender dominance. Out of 50 cases, 21 (42%) affected the right eye, 29 (29%) affected the left eye, and 10 (20%) developed symptoms after more than two weeks. Of those cases, 21 (42%) affected the right eye, and 29 (29%) affected the left eye. 56 percent of the 50 cases presented with cataracts in the other eye. Pseudophakia was present in 16 cases (32%) with clear vision. The remaining six cases, or 12 percent, were aphakic with restored vision.

There were 50 cases, of which 29 (58%) had phacomorphic glaucoma, 19 (38%) had phacolytic glaucoma, and the remaining 1 (2%) had lens particle glaucoma and subluxated/dislocation of the lens (Figure 1). Out of 50 cases, 47 (94%) showed light perception, while the remaining 3 (6%) showed hand movements. Out of 50 cases, 3 (6%) showed IOP below 30 mmHg, 20 (40%) showed IOP between 31-40 mmHg, and the remaining 27 (54%) showed IOP greater than 41 mmHg. 20 (40%) of the 50 cases had a deep anterior chamber, while the remaining 30 (60%) had a shallow anterior chamber. Out of 50 cases, 49 (98 percent) were treated surgically with

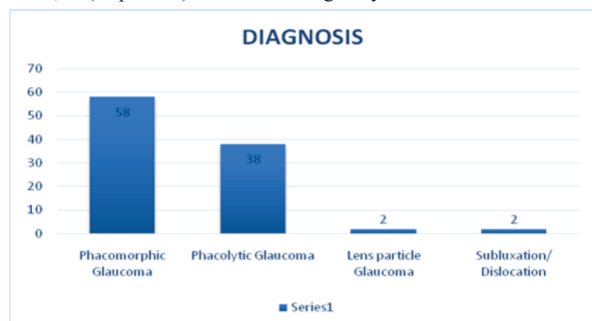


Figure 1: Types of Lens induce glaucoma

PCIOI insertion, while the remaining one (1%) was managed conservatively. 14 of the 50 cases (28 percent) had a good BCVA of 6/6-6/12, 16 of the cases (32 percent) had a moderate BCVA of 6/18-6/36, and 20 of the cases (40 percent) had very poor vision of 6/60 or less. Out of 50 cases, 49 were operated on; intraoperative complications included vitreous loss by PCR in one case (2%), and exudate membrane in the remaining one case (2%) (Table 1).

Table1: Intraoperative complications of LIG

	Frequency	Percent
NORMAL	48	96.0
Exudate Membrane	1	2.0
PCR with HVL	1	2.0
Total	50	100.0

Out of the 50 cases, 29 (58%) had phacomorphic glaucoma diagnosed and operated. Eight patients (16%) had a good BCVA of 6/6-6/12, nine patients (18%) had a moderate BCVA of 6/18-6/36, and 12 patients (24%) had a poor BCVA of 6/60. Six of the 19 cases of phacolytic glaucoma, or 38 percent, had a good BCVA of 6/6-6/12, while six of the cases, or 12 percent, had a moderate BCVA of 6/18-6/36. The remaining seven cases, or 14 percent, had a poor BCVA of less than 6/60. One patient (two percent) who presented with subluxation or dislocation had a BCVA of 6/18-6/36. In the case of lens particle glaucoma, the remaining one case (2%) had a poor BCVA of 6/60. The statically insignificant P value is 0.706 Three patients out of 50 had an IOP of less than 30 mmHg. Two of these patients, 4 percent, had a good

BCVA of 6/6-6/12, and the remaining one patient, 2 percent, had a poor BCVA of 6/60. The remaining 20 patients (40 percent) had an IOP of 31-40 mmHg; three patients (6 percent) had a good BCVA of 6/6-6/12, eight (16 percent) had a moderate BCVA of 6/18-6/36, and nine (18 percent) had a poor BCVA of 6/60. The remaining 27 patients (48 percent) had an IOP of more than 41 millimeters of mercury. Nine patients (18 percent) had a good BCVA of 6/6-6/12, eight patients (16 percent) had a fair BCVA of 6/18-6/36, and ten patients (20 percent) had a poor BCVA of 6/60. Statically insignificant, P value 0.319.

DISCUSSION:

Distribution By Age And Gender:

The majority of our study participants are between the ages of 66 and 75. The fact is comparable to that of Sreenivasalu et al.⁴ and Narendranath reddy G et al.⁶, whose study found that the majority of patients were between the ages of 66 and 75. In our study, the distribution of sex in cases of LIG was 50:50. This could be because agricultural laborers of both sexes work together to earn money or lower labor costs. According to Narendranath reddy G et al.'s study⁶, the prevalence of LIG was higher in females than in males. In contrast to our research, Bhuyan Jyoti et al.⁷ We found that the LIG was more prevalent in females than in males.

Demographic And Clinical Details:

The vast majority of patients were agricultural laborers with low literacy and poverty levels who resided in remote villages far from established health centers. The majority of them were elderly and illiterate, and they were particularly affected by their lack of awareness of the disease, fear of surgery, and belief that they might still have poor vision after surgery.⁵

LIG was unilateral in the majority of the cases we examined. With the left eye (58%) being affected more frequently than the right eye (42%). About 42% of patients reported symptoms within one to two weeks, 38% within one week, and the remaining patients visited the hospital after two weeks. Intolerable pain was the primary symptom that brought them to the hospital, followed by visual impairment. It was discovered that the visual prognosis deteriorated with treatment delay. According to previous study, more cases were presented in less than a week. The Bhuyana jyoti study also found that the most cases occurred in the first week.⁷ Statistically, a p value of 0.001 indicates that the majority of the study's participants had other eye pseudophakia and aphakia. 16 cases of pseudophakia (32 percent) and 6 cases of aphakia (12 percent) made up the study's 44%. Most of these patients ignored their other eye until they developed a problem in the affected eye because they had good vision in that eye. The majority of cases with immature cataracts had not yet made a decision regarding cataract surgery, indicating that they were unable to pay for the procedure or were unaware of the options. Aphakia was present in approximately 12 percent of cases, leading us to believe that the patients may have approached us too late for surgery. They may have experienced intraoperative complications, which could have resulted in aphakia, given that they presented later. Similar outcomes were found in the Narendranath reddy G et al. study.⁶ Additionally, a study by Rani Sujatha et al.⁸ produced the same outcomes as ours. According to the Patra Rajkumar et al. study¹⁰, there were 8 cases of pseudophakia (21.63 percent), 4 cases of mature cataract (10.8%), and 25 cases of immature cataract (67.57 percent). The interpretation and diagnosis in our study of LIG, 58% of patients had phacomorphic glaucoma, 38% had phacolytic glaucoma, 2% had lens particle glaucoma, and 2% had subluxation or dislocation. The most common type of LIG was phacomorphic glaucoma. Lahan study (72%) and Madurai study (52.7%)² both found a similar pattern. Lens particle glaucoma, subluxation/dislocation glaucoma, and phacomorphic glaucoma accounted for 2% (one case) and 58% (29 cases) of diagnosable cases, respectively. Phacomorphic glaucoma (68 percent), phacolytic glaucoma (24 percent), lens particle glaucoma (4%), subluxation/dislocation (4%), and phacomorphic glaucoma (6%). The diagnosis of phacomorphic glaucoma (67.57%), phacolytic glaucoma (29.73%), subluxated glaucoma (2.7%), and phacoanaphylactic glaucoma (0%) in the Patra Rajkumar et al. study¹⁰ was different from ours.

Prior to surgery, 94% of patients reported seeing light and 6% reported seeing hand movements. This indicates that the majority of patients were approached for treatment too late. The study found a statistically significant relationship between visual acuity and disease with a p value of 0.001. Preoperative IOP 27 patients out of 50 had IOP greater

than 41 millimeters of mercury (mmHg) upon admission, 20 patients (40 percent) had IOP between 31 and 40 millimeters of mercury (mmHg), and only 3 patients (6%) had IOP below 30 millimeters of mercury (mmHg). In this study, an effort was also made to determine whether mechanisms of secondary glaucoma have any bearing on IOP, and the following observations were made: There was a statistically significant preponderance between IOP and disease, with a p value of 0.001. Similar outcomes were found in Rani Sujatha et al.'s study.⁸ After bringing the IOP back to normal, all 50 cases were treated surgically.

Intraoperative Complications

Exudative membrane and PCR with vitreous loss were the only complications we encountered in two cases (4%). PCIOL implants were used to treat all of the cases. PCIOL with a sulcus-fixed lens was only found in two cases. In contrast to our study, Narendranath reddy G et al.⁶ found that PCR with vitreous loss of 12 percent was an intraoperative complication. In addition, a study by Rani Sujatha et al.⁸ revealed intraoperative complications in the form of PCR and vitreous loss in six cases (12%), which was slightly higher than ours.

Post-op Complications:

A few minor complications after the operation were seen, such as corneal edema and corneal striae, which were treated with eye drops containing hypersol (5 percent) and timolol maleate (0.5 percent). In contrast to our study, Rani Sujatha et al.⁸ found that AC reaction, exudative membrane, and hypopyon were postoperative complications.

All patients were examined for 45 days (6 weeks). After surgery, 28% of patients had clear vision (6/6-12). Then, 32% had moderate vision between 6/18 and 6/36. 23 cases, or 40%, had vision impairment of 6/60 or less. This group is made up of people who sought treatment very late on and had elevated and persistent IOP for a longer period of time.

In our study, we found that 47 people went to the hospital when their IOP was above 30 mmHg (31 to 40 mmHg), indicating that their increased IOP was the reason they went there. It has been discovered that the visual outcome is poorer the longer the duration of increased IOP and the greater the delay. Furthermore, poor vision increases with age. Preoperative IOP and visual outcomes were correlated, with a p value of 0.319 for a clinically significant but statistically insignificant correlation. Of the 20 cases that were presented, 15% received excellent BCVA and 40% received moderate BCVA. Similar outcomes were found in Rani Sujatha et al.'s study.¹¹

The Madurai study also found no statistically significant relationship between the level of preoperative IOP and final visual acuity (p value=0.07).² The Bhuyana Jyoti et al.⁷¹ study also found a correlation that was clinically significant but not statistically significant (p=0.5659) between preoperative IOP and final visual outcome. However, the difference between our study and that of Narendranath reddy G et al.⁶ is that the correlation between IOP and BVCA was clinically and statistically significant.

CONCLUSIONS:

The most important symptom which brought LIG patients to the hospital was pain followed by a gross diminution of vision. The cause of loss of vision was more with people who reported to the hospital too late and with sustained increased IOP for a longer duration.

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