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Ophthalmology

# A CLINICAL STUDY ON LENS INDUCED GLAUCOMA IN PATIENTS ATTENDING GOVERNMENT GENERAL HOSPITAL,SRIKAKULAM.

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| **Dr. Tammana Jyothirmai** | Associate Professor of Ophthalmology Government Medical College, Srikakulam. |
| **Dr. BNS Rekha** | Post Graduate of Ophthalmology, Government Medical College, Srikakulam. |
| **Dr. Maridi Aparna** | Comprehensive Ophthalmology Fellowship, Globe Eye Foundation, Hoskote , Karnataka. |
| **Dr. Vepa Meenakshi*** | Associate Professor of Ophthalmology, Rangaraya Medical college, Kakinada. *Corresponding Author |

**ABSTRACT**

**AIM:** To determine the prevalence and visual outcomes after cataract surgery in different LIG patients

**METHODS:**In this prospective study 50 patients were taken into study. Detailed history was taken and slit lamp examination was done & IOP was recorded by AT. All the patients were treated preoperatively appropriately. Patients were operated with SICS with PC IOL implantation and Peripheral Iridectomy.During follow up a detailed Ocular examination was done including Refraction using snellens chart and IOP measurement with AT.

**RESULTS:** Among 50 patients 21(42%)were male patients and 29(58%)were female. Maximum patients had Phacomorphic Glaucoma accounting 72% (36patients) and Phacolytic Glaucoma 24%. Highest percentage was among 40-49mmHg (52%) followed by 30-39mmHg (36%) and >50mmHg (10%). Highest patients were between 10-19mmHg (76%). Visual acuity on admission, highest patients were seen in HM positive (64%) followed by PL+(32%). Even No PL were also seen (4%). On follow up after 6weeks ,majority were seen between 6/12-6/18(52%)

**CONCLUSION:** LIG is an important vision-threatening disease presenting as a painful red eye. It is remaining as one of the important cause of Blindness not only because of Senile cataract but even after cataract surgery due to Glaucoma caused by neglected cataractous lens.Hence, importance should be given for timely surgery for better visual outcome .

**KEYWORDS :** Lens-induced glaucoma, phacomorphic glaucoma, phacolytic glaucoma, SICS, PCIOL,Hand movements, applanation tonometry, perception of light

## INTRODUCTION:

The human crystalline lens is a unique transparent, biconvex intraocular structure which lies in the anterior segment of the eye between the iris and vitreous body.

The estimated prevalence of blindness in India was 1.99% in which 80% if taken care in time, completely preventable.Cataract in India is the most important cause of preventable blindness accounting to 77.50%[1]

LIG was first described in the year 1900 by Gifford[2]and Von Reuss[3]independent of each other. While the former described it as glaucoma associated with spontaneous absorption of lens substance through intact lens capsule. Later many other researchers did research on such type of cases and named it differently[4-6]

LIG is a clinical condition characterized by

1. A severe secondary glaucoma in one eye with senile mature cataract, hypermaturecataract(rarely IMSC) yet with an open angle
2. Normal intraocular pressure and Open angle in other eye and
3. Prompt relief of symptoms and restoration of vision after cataract extraction in the effected eye [7]

LIG is most common in India due to delay in cataract removal[8,9].Normally cataract occurs when normal crystalline lens lose its transparency due to ageing process.

In Phacomorphic glaucoma, the swollen lens may block the anterior flow of the aqueous humor, pushing the iris forward, eventually TM gets blocked by the iris and leads to sudden and extreme rise of IOP

Phacolytic glaucoma presents with sudden onset of Open angle glaucoma caused by leaking of lens protein through a relatively intact capsule in mature or hypermature cataract This lens protein causes intense inflammation and blockage of TM, subsequently causing elevation of IOP [7]

This study emphasizes the importance of early diagnosis, patient education, frequent and regular surveillance of all cases of cataract which go for hyper maturity and early surgical intervention .

## AIM OF THE STUDY

To study the prevalence and visual outcomes after cataract surgery in different LIG patients

## MATERIALS AND METHODS

This is a prospective study conducted in department of Ophthal mology,GGH, Srikakulam over a 6 month period from September 2020 to February 2021.

50 patients visiting the hospital with classical symptoms of LIG were taken into study.

## INCLUSION CRITERIA:

1. Phacomorphic glaucoma-pain, redness, Shallow AC, Corneal edema and increased IOP with intumescent lens.
2. Phacolytic glaucoma: presence of HM cataract with intact capsule, Deep AC, raised IOP, varying degree of aqueous flare and cells with no Kps
3. Phacotoxic Uveitis/Lens particle glaucoma- HM cataract/ Traumatic rupture of lens capsule, Mild to moderate signs of iridocyclitis, Deep AC.
4. Phacoanaphylactic Uveitis with secondary glaucoma
5. Glaucoma secondary to ectopia lentis.

## EXCLUSION CRITERIA:

1.Cases of primary glaucoma associated with cataract
2.Cases of LIGs with significant Anterior segment pathology

## METHODOLOGY:

Detailed history and a thorough ocular examination using Slit lamp biomicroscopy was done in 50 patients & IOP is recorded by Applanation tonometry.

All the patients were treated preoperatively with I.V mannitol and oral Acetazolamide tablet and timolol eye drops depending on pressure elevation.

After explaining the possible prognosis, patients were operated with SICS with PC IOL implantation and Peripheral Iridectomy.

Post operatively immense care is taken to prevent posterior synchiae formation using short acting cycloplegics and thorough post operative evaluation was done.

All the results were entered in computer and evaluated.

## RESULTS:

### AGE and SEX:

Among the 50 cases, the incidence of LIG was slightly higher in Females (58%) than Males(42%) and maximum patients were from age group66-75 years(40%).The youngest case in the study was 51 years old and the oldest was 79 yrs

**Table 1: Sex And Age Distribution Among The Patients**

| AGE GROUP (YRS) | MALES | FEMALES | TOTAL |
|---|---|---|---|
| 46-55 | 3(6%) | 7(14%) | 10(20%) |
| 56-65 | 7(14%) | 9(18%) | 16(32%) |
| 66-75 | 9(18%) | 9(18%) | 20(40%) |
| **>75** | 2(4%) | 2(4%) | 4(8%) |
| TOTAL | 21(42%) | 29(58%) | 50(100%) |

### DURATION OF SYMPTOMS:

Cases presented after the development of symptoms as follows

**Table 2: Duration Of Symptoms Before Presenting To The Hospital**

| Duration in weeks | Number | Percentage |
|---|---|---|
| Within 1st week | 29cases | 58% |
| Within 2nd week | 11cases | 22% |
| >3 weeks | 10 cases | 20% |

### STATUS OF FELLOW EYE:

Fellow eye of the patients was without any glaucomatous changes

**Table 3: Status Of Other Eye Among The Patients**

| Status of fellow eye | Number | Percentage |
|---|---|---|
| Pseudophakia | 28 | 56% |
| Mature cataract | 6 | 12% |
| Immature cataract | 14 | 28% |
| Aphakia | 2 | 4% |

### ETIOLOGICAL DIAGNOSIS:

Among different types of LIG about 72% of cases constitutes Phacomorphic glaucoma, Phacolytic glaucoma in 24% cases

**Table 4: Types Of Lig**

| Types of LIG | Number | Percentage |
|---|---|---|
| Phacomorphic Glaucoma | 36 | 72% |
| Phacolytic Glaucoma | 12 | 24% |
| Subluxated Glaucoma | 2 | 4% |
| Phacoanaphylactic Glaucoma | 0 | 0% |
| Lens Particle Glaucoma | 0 | 0% |

### INTRAOCULAR PRESSURE:

Intraocular pressure was measured on admission before any medication and highest % (52%) noted were in the range of 40-49 mm hg .On immediate Post-op and during discharge ,IOP was recorded and noted, highest % were between 10-19 mm hg making it clear, that eyes were out of danger

**Table 5: Iop Readings Of The Patients On The Day Of Admission,pod1 And On The Day Of Discharge**

| IOP(mm Hg) | On Admission | POD-1 | On Discharge |
|---|---|---|---|
| <10 | - | 2(4%) | 4(8%) |
| >10-19 | - | **26(52%)** | **38(76%)** |
| >20-29 | 1(2%) | 19(38%) | 7(14%) |
| >30-39 | 18(36%) | 2(4%) | 1(2%) |
| **>40-49** | **26(52%)** | 1(2%) | - |
| >50 | 5(10%) | - | - |

### VISUAL OUTCOME:

Similarly, Visual acuity were measured at three intervals using Snellen's chart and readings were noted.

On admission, highest patients were seen in Hand movements(64%) followed by PL +ve (32%) and even no PL were seen in some.

On the day of discharge ,highest percentage (56%) were seen in 6/24 - 6/36 visual acuity

On the day of follow up after 6 months of Surgery, maximum patients(52%) were seen between 6/12 - 6/18 visual acuity

These details clearly indicate there is a complete improvement of visual acuity without any medication and by just removal of cataractous lens

**Table 6 :visual Acuity Of The Patients On The Day Of Admission, On The Day Of Discharge And On 6 Weeks Follow Up.**

| Visual Acuity | On Admission | On Discharge | On 6 weeks Follow up |
|---|---|---|---|
| 6/6 – 6/9 | - | 1(2%) | 6(12%) |
| 6/12 – 6/18 | - | 4(8%) | 26(52%) |
| 6/24 – 6/36 | - | 28(56%) | 11(22%) |
| 6/60 – 1/60 | - | 11(22%) | 4(8%) |
| CF at ½ meters | - | 2(4%) | - |
| HM | 32(64%) | 2(4%) | 1(2%) |
| PL | 16(32%) | - | - |
| NO PL | 2(4%) | 2(4%) | 2(4%) |

## DISCUSSION:

Lens induced Glaucoma is common in India due to the fact that, cataract surgery, In spite of easy availability of surgical facilities and being a very cost effective and rewarding surgery, still many people are becoming blind due to lack of awareness about significance of early management.Illiterate, older, and rural population are the worst affected[7]

In the present study a total of 50 patients were taken into this study in which 21(42%) were male patients and 29(58%) were Female.

This female dominance was also seen in study conducted by Dr.Venkatesh Prajna et al [10], Raghunandan Kothari et al [7] and Rijal AP et al Nepal[11].Reason for these can be the Socio-economical and Gender based constraints present in especially Rural India. Also another reason being cataract more common in female than male population in our country[10]

In our study among all types of Glaucoma's, highest was seen Phacomorphic Glaucoma accounting 72%, Phacolytic Glaucoma was present in 12 patients which accounted 24%.Subluxated Glaucoma was seen in 2 patients in our study (4%).Similar findings were seen by V Prajna et al.[10] And Raghunandan Kothari et al.[7]

It was also noted that Phacolytic Glaucoma was seen more in advanced age as compared to phacomorphic Glaucoma. These Similar findings were seen inJedziniak JA et al[12] and Spector A et al[13] .Reason for these can be accumulation of high molecular weight molecules in lens as the time progresses.

Intra Ocular pressure was measured on admission prior to medication. Highest percentage was among 40-49mmHg(52%) followed by 30-39 mmHg(36%) and >50 mmHg(10%).These pressure were considerably high and needed immediate intervention.

After surgery during discharge all those patients were measured again for IOP and noted. Highest patients were between 10-19mmHg (52%). Rest were 20-29 (38%) and <10 mmHg (4%) making it clear that eyes were out of danger.This Drastic fall in IOP was only due to fact that cause for the Glaucoma was Lens induced swelling and elimination of cause, brought the IOP back to normal. Same Findings were seen in studies conducted by Yaakub et al [14]Raghunandan Kothari et al[7]Rijal AP et al[11]

A drastic shift of visual acuity from major HMs and PL positive to 6/12-1/60 during the day of discharge.When the patients came back for follow up on 6th week post-operative day there was again improvement of major patient population 6/6-6/36.

These changes clearly indicates that cause of Blindness was lens induced and when the cause was eliminated, there was a drastic improvement in the vision. With appropriate IOL implantation majority of patients remained in 6/12-6/18 vision.

There was 4% of patients who had no perception of light during admission remained there only even after the surgery. This was the group where time lag between development of symptoms and reporting for treatment was the longest. So the long standing

Glaucoma caused permanent damage to their Optic nerve leading to glaucomatous optic atrophy.Similar findings were seen in studies conducted by Venkatesh Prajna et al [10], Rijal Ap et al [11]and Yaakub et al [14]from Malaysia. In the study by Venkatesh Prajna 59% of patients had visual outcome 6/18 or better. Study by Yaakub et al, a study conducted in Malaysia, visual outcome 6/18 or better was 57.9%.

## CONCLUSION:

LIG is a vision-threatening disease presenting as a painful red eye. It is remaining as one of the important cause of Blindness not only because of Senile cataract but even after cataract surgery due to Glaucoma caused by neglected cataractous lens.A phacomorphic lens disease secondary to a neglected senile cataract is the major cause of LIG.

Even after advanced surgical techniques being invented in recent decades and immense efforts of National Programme of Control of Blindness, Lack of awareness among especially Rural population and good vision in fellow eye is causing them to remain with cataractous lens for a prolonged period. So necessary steps should be taken to health educate especially Rural population of India, the importance of timely surgery for better visual outcome and the dangers of poor visual result if cataract surgery is delayed.

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