

# Study of presentation and management outcome in patient with lens induced glaucoma

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## Abstract

**Purpose:** To study presentation, intraocular pressure (IOP) control, visual prognosis and outcome of management in patients with lens induced glaucoma (LIG) **Methods:** Total 75 patients with LIG were included in the study. The diagnosis of different types of LIG was made on the basis of clinical signs and symptoms. Medical as well as surgical management of these patients were done. **Results:** Among the 75 cases majority of the cases were in the age group of 61 to 70 years (62.66%). The incidence was higher in females (76%) than males. (24%). In 31 cases (41.33%), right eye was affected while in 44 cases (58.67%) left eye was affected. 48 cases (64%) presented within the first week, 15 cases (20%) within 2nd week and rest presented more than 2 weeks after development of symptoms. Post-operative vision in 48 cases (64%) presented within 1 week was better than 6/12 while in 15 cases (20%) presented between 1 to 2 weeks was between 6/18 to 6/60 and 12 (16%) cases presented after 2 weeks had poor post-operative vision of less than 6/60. 69 cases (92%) were diagnosed as phacomorphic glaucoma (PMG), 06 cases (08%) were of phacolytic glaucoma (PLG), 11 cases (14.67%) presented with IOP less than 30mm Hg, 36 cases (48 %) with IOP between 30-40mm Hg. 22 cases (29.33%) presented with IOP between 40-50 mmHg. Rest of the cases presented with IOP more than 50mm Hg (8%). 63 cases (84%) had fairly good vision in the other eye while the remaining 12 cases (16%) had poor vision in the other eye. **Conclusion:** It is to be stressed upon, imparting health education and creating awareness regarding cataract and its implications among the rural community, ophthalmic assistants and peripheral health workers.

**Key Words:** Lens induced glaucoma, phacomorphic glaucoma, phacolytic glaucoma, small incision cataract surgery.

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Received Date: 21/11/2017 Revised Date: 15/12/2017 Accepted Date: 03/01/2018

DOI: <https://doi.org/10.26611/1009512>

## Access this article online

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Accessed Date:  
10 January 2018

## INTRODUCTION

The human crystalline lens is a unique transparent, biconvex intraocular structure, which lies in the anterior segment of the eye suspended radially at its equator by zonular fibers to the ciliary body, between the iris and vitreous. It is enclosed in capsular bag and lies in patellar fossa. Cataract has been documented to be the most significant cause of bilateral blindness both in India as

well as on global scale.<sup>1-4</sup> It has been estimated that there are about 12.5 million blind people in India, with 50 to 80% of this group due to cataract.<sup>2-5</sup> There is an ever-increasing backlog of cataract due to the population explosion, increased life expectancy and low productivity in terms of utilization of the available surgical services. Lens induced glaucoma (LIG) due to hyper mature cataract is an important cause of secondary glaucoma. It is a common entity in developing countries like India due to lack of awareness of and delayed surgical interventional removal. This is mainly due to general misbelief that cataract should be mature at the time of surgery to avoid complications.<sup>6</sup> Old age, concurrent systemic diseases, economic constraint, are among the other reasons for patients not receiving treatment.<sup>6</sup> Preoperative and post operative morbidity is more in an eye with lens induced glaucoma than that with a simple uncomplicated cataract. Prognosis and visual outcome is also affected to some extent. Hence there is need to educate patients about dangers of lens induced glaucoma

and poor outcome if treatment is delayed. Each case depending on the mechanism by which glaucoma occurs, has to be managed in a different way. In general, after controlling the intraocular tension, cataract extraction with intraocular lens (IOL) implantation should be performed preferably. This study emphasizes the importance of early diagnosis, patient education, frequent and regular follow up of all cases of cataract which go for hypermaturity, cases should be operated before a cataract becomes hyper mature. Hence the present study was undertaken and aimed at a study of presentation of various forms of lens induced glaucoma, their management, post operative visual outcome and intraocular pressure control as practiced in the department of ophthalmology, tertiary care center.

## MATERIAL AND METHODS

All the cases studied were admitted and treated at the ophthalmic ward, government medical college and hospital Latur. While selecting the cases for the study special care was taken not to include cases of primary glaucoma with cataract.

**Source of data:** All the 75 patients were those who attended the ophthalmology outpatient department and were diagnosed to be having lens Induced Glaucoma.

**Inclusion Criteria:** All the consecutive patients diagnosed as lens induced glaucoma on the basis of clinical signs and symptoms presented to outpatient department. The following criteria were applied to clinically diagnose the various types of lens induced glaucomas:

### Phacomorphic glaucoma

- Shallow anterior chamber
- Intumescence of mature cataract
- Raised IOP

### Phacolytic glaucoma

- Deep anterior chamber
- Hypermature cataract
- Raised IOP
- Varying degree of aqueous flare and cells and nokeratic precipitates(K. P's)

### Phacotoxic uveitis/ lens particle glaucoma

- Hypermature cataract.
- Traumatic rupture of lens capsule or postoperative retained lens matter
- Mild to moderate signs of iridocyclitis, deep anterior chamber.
- Very few or no K. P's

### Phacoanaphylactic uveitis with secondary glaucoma

- History of cataract surgery or injury to lens
- Very severe clinical picture of iridocyclitis.
- Large number of mutton fat like K. P's

## Exclusion Criteria

1. Cases with preexisting corneal pathology.
2. Cases with uncontrolled diabetes and other severe systemic diseases like cardiovascular diseases, transient ischemic attacks or stroke
3. Patients not willing to come in study

**Sampling size and methods:** A minimum of 75 cases of lens induced glaucoma were selected based on simple random sampling. Age and sex were not criteria in selecting cases. The study was made on patients diagnosed with lens induced glaucoma and admitted to the ophthalmic ward, government medical college Hospitallatur, during the period of November 2011 to September 2013.

**Patient Evaluation:** All the 75 patients after clinical diagnosis were admitted and a detailed history and examination were done. Detailed history pertaining to the causation of glaucoma in the affected eye was ascertained. The details of history included the duration and progress of diminution of vision, onset of pain, redness, watering and photophobia in

the affected eye and associated symptoms such as headache, nausea and vomiting were taken. Any history of ocular trauma or previous surgery in the eye was enquired. The physical examination of all these 75 patients included a thorough examination of their general and systemic conditions. Examination of the globe and adnexa included all the features that help in diagnosing the condition and also the features that may affect the final visual outcome. In the affected eye vision was recorded and retinal function test was done by assessing the perception of light and projection of rays. The intraocular pressure was measured using Schiotz tonometer, 2 readings were taken to establish the final IOP. In cases where there was corneal edema, IOP was measured after reducing the pressure with IV Mannitol. A detailed examination of the other eye was done. Other routine tests like lacrimal syringing, A scan biometry, urine sugar, ECG, blood pressure recording were done.

**Management:** The management of the cases included relief from pain and bringing down the raised IOP. Apart from these, subsidence of the uveal inflammation was also a priority. These were achieved through both medical and surgical measures.

**Medical Management:** Medical management consisted of analgesics, mydriatics depending upon whether the glaucoma was due to pupil block, topical steroids, antiglaucomamedication and drugs for reducing associated features. Oral analgesics given in majority was Tab Diclofenac Sodium, Intramuscular injections was preferred if patient had associated vomiting. Mydriatic were used in cases with open angle mechanism type of

glaucomas. Topical Atropine Sulphate 1% eye ointment which helps to reduce uveal inflammation also and reduced pain due to its cycloplegic action. Topical steroid preferred was Prednisolone eye drops every hourly application which helps to bring down the inflammation. Systemic steroids were preferred in cases with severe iridocyclitis with Tab. Prednisolone 1gm/kg body weight/day. To reduce the IOP, Inj. Mannitol 20%, 100ml was given IV along with oral Acetazolamide 500mg stat followed by 250 mg 6th hourly. This was supplemented with topical beta-blockers preferably 0.5% Timolol maleate eye drops bd. Supportive management consisted of antiemetics such as inj. Domperidone IV to reduce vomiting.

**Preoperative Management:** Prior to surgery, IOP was recorded in all patients and if the IOP was still raised Inj. Mannitol 20%, 100 ml IV was given at the rate of 50drops/min over a period of 30 min along with oral Tab. Acetazolamide 500mg stat 250 mg QID maintenance. Pre-operatively pupils were dilated with combination of Tropicacyl (0.08%) and Phenylephrine(5%) eyedrops, instilled every 15min until the pupils dilated. 1 drop of Flurbiprofen(0.03%) eyedrops were instilled 1/2hourly 3 times preoperatively to prevent intra operative miosis.

**Surgical Management:** Following control of IOP patient was operated for lens extraction. The preferred surgery was Manual Small Incision Cataract Surgery with PCIOL implantation under local (peribulbar) anaesthesia. Suitable modifications in the surgical steps were made according to the situation encountered.

**Technique of Surgery**

- Peribulbar anesthesia was given using a 24G needle under aseptic precautions.
- Eyeball and periorbital region was painted and draped.
- Wire speculum was used to keep the lids apart during surgery
- Superior rectus bridle suture was placed then fornix based conjunctival flap was made and Minimal cautery was used to obliterate the bleeding vessels if necessary.
- Incision was made around 2mm away from the superior limbus using a 15 No. Surgical blade, the length of the incision was 6mm.
- Using an angled crescent blade, a sclerocorneal tunnel was made upto 1.5mm into the clear cornea.
- A sideport was made using a 15 degree side port entry blade at the 9 o'clock or the 3 o'clock limbus depending on the right eye or left eye respectively.
- AC formed with air and the capsule was stained using Trypan blue.

- Capsulotomy was done either by continuous circular capsulorrhexis(CCC) or can opener technique depending on the situation.
- AC formed with viscoelastic and entry into the AC through the main tunnel done using a 3.2mm angled keratome and internal opening enlarged using a 5.2mm angled keratome.
- Hydrodissection was done using a 27 G hydrodissection needle.
- Nucleus prolapsed into AC and delivered out by visco expression.
- The remaining cortical matter was removed by continuous irrigation and aspiration.
- AC was formed with viscoelastics and the capsular bag distended.
- IOL was implanted in the capsular bag or in the sulcus.
- Minimal AC wash done to remove the viscoelastic material.
- Wound closed by hydrating the sideport.
- Subconjunctival injection of gentamycin and dexamethasone was given.
- Any complications that occurred during the surgery were noted down.

**Postoperative management:** Eye pad was removed next day. Detailed slit lamp evaluation was done and looked for any post-operative complications. Vision with pin hole was tested on the first day. All the patients were given topical antibiotic, steroid drops to be intilled 8-10 times daily for a period of 6 weeks on tapering dose. Patients were followed up after 1 and 6 weeks or frequent follow up according any post operative complication and at each visit a detailed slit lamp examination, tonometry and BCVA were recorded. The above data were compiled using a standardized proforma and at the end of the study the data was analysed statistically using the Chi-Square method and the Probabaility value.

**RESULTS**

Table 1: Age distribution

Age in years	No. Of Cases		Total	Percentage (%)
	Males	Females		
41-50	0	2	2	2.66
51-60	4	10	14	18.66
61-70	9	38	47	62.66
71-80	5	7	12	16.00
Above 80	0	0	0	00

(Chi square =3.452, P =0.327, Not Significant)

**Age Distribution:** Among the 75 cases that were included in the study, majority of the cases were in the age group of 61to 70 years (62.66 %). The youngest case in the study group was 43 years old while the oldest was 78 year old.

**Table 2: Sexwise distribution**

Sex	No Of Cases	Percentage
Male	18	24
Female	57	76
<b>Total</b>	<b>75</b>	<b>100</b>

The incidence of lens induced glaucoma was higher in females (76%) than males.(24%)

**Table 3: Eye affected**

Eye affected	Number of cases	Percentage
RE	31	41.33
LE	44	58.67

In 31 cases (41.33%), right eye was affected while in 44 cases (58.67 %) left eye was affected.

**Table 4: Duration of symptom**

Duration of symptoms(weeks)	No. of patients	Percentage
Less than 1 week	48	64
1-2 weeks	15	20
More than 2 weeks	12	16

Out of the 75 cases, 48 cases (64%) presented within the first week and 15 cases (20%) within 2nd week and rest presented more than 2 weeks after development of symptoms.

**Table 5: Relationship between duration of symptoms and post operative best corrected visual acuity**

Duration of symptoms	No. of Cases	visual acuity better than 6/12	visual acuity between 6/18 to 6/60	visual acuity below 6/60
Less than 1 week	48	48	-	-
1-2 weeks	15	-	15	-
More than 2 weeks	12	-	-	12

Out of 75 patients, 48 cases (64%) presented within 1 week had good vision of better than 6/12, 15 cases (20%) presented between 1to 2 weeks had fairly useful vision between 6/18 to 6/60 and 12 (16%) cases presented after 2 weeks had poor vision of less than 6/60

**Table 6: Aetiological diagnosis**

Aetiological diagnosis	No. of Patients	Percentage
Phacomorphic glaucoma	69	92
Phacolytic glaucoma	06	8
Lens particle glaucoma	00	0
Phacoanaphylactic glaucoma	00	0

Out of 75 cases, 69 cases (92%) were diagnosed as phacomorphic glaucoma (PMG), 06 cases (08%) were of phacolytic glaucoma (PLG),

**Table 7: Condition of other eye**

Condition of other eye	Number Of cases	Percentage
Immature/Mature cataract	26	34.67
Pseudophakia	45	60
Aphakia	4	5.33

In the 75 cases, 45 cases (60%) presented with pseudophakia, 26 cases (34.67%) presented with combined immature and mature cataract, 4 cases (5.33%) were aphakic

**Table 8: Vision in other eye**

BCVA	Number of cases	Percentage
6/6- 6/12	32	42.67
6/18- 6/60	31	41.33
Below 6/60	12	16

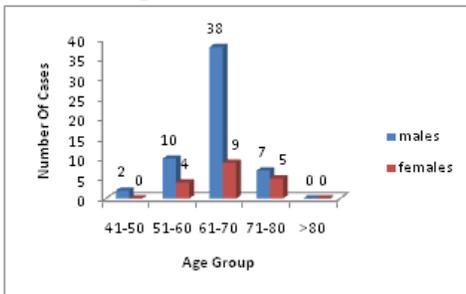
(Chi square =31.438, P <0.05, Significant)

Overall, 63 cases (84%) had fairly good vision in the other eye while the remaining 12 cases (16%) had poor vision in the other eye.

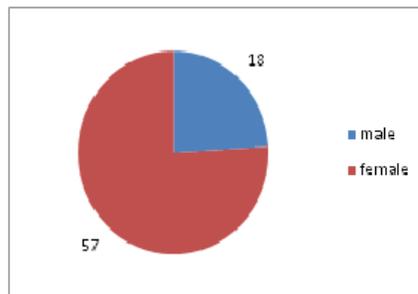
**Table 9: Presenting IOP on admission**

Presenting IOP on admission	No of cases	Percentage
21-30 mmHg	11	14.67
30-40 mmHg	36	48
40-50 mmHg	22	29.33
Above 50 mmHg	6	8

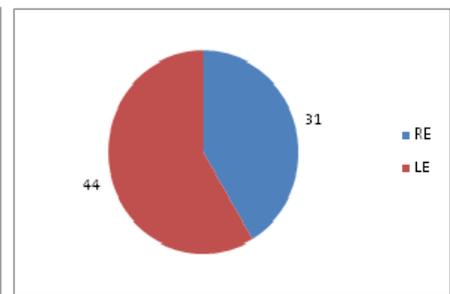
(r= -0.137, P value = 0.242, Not Significant) (r= Pearson's Correlation)



**Figure 1**



**Figure 2**



**Figure 3**

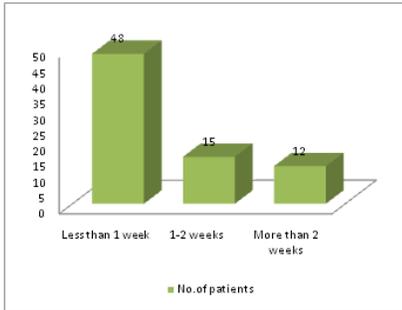


Figure 4

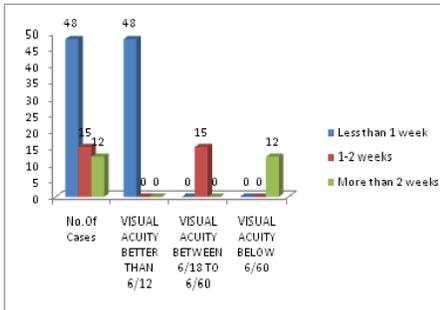


Figure 5

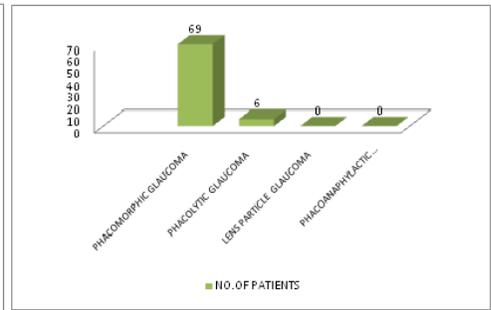


Figure 6

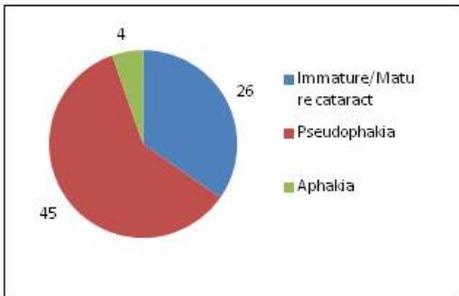


Figure 7

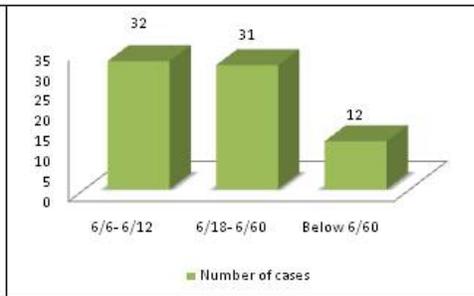


Figure 8

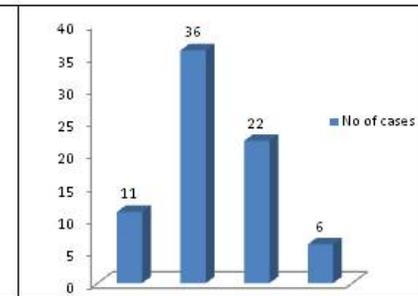


Figure 9

**Legend**

Figure 1: Age distribution; Figure 2: Sex distribution; Figure 3: Eye affected; Figure 4: Duration of symptoms; Figure 5: Relationship between duration of symptoms and post operative best corrected visual acuity; Figure 6: Aetiological diagnosis; Figure 7: Condition of other eye; Figure 8: Vision in other eye; Figure 9: Pre -Operative IOP

**Presenting IOP on admission:** 11 cases (14.67%) presented with IOP less than 30mm Hg, 36 cases (48%) with IOP between 30- 40mm Hg. 22 cases (29.33%) presented with IOP between 40-50 mmHg. Rest of the cases presented with IOP more than 50mm Hg (8%).

**DISCUSSION**

Lens induced glaucoma is not uncommon in our population, where people cannot afford to undergo cataract surgery in time due to various financial, social, geographical, and other constraints. Lens induced glaucoma often seen in our country, where the incidence of cataract cases exceeds the performance of cataract surgery. These lens induced glaucoma compromise the optic nerve functioning due to high intraocular pressure. The only modality of treatment is cataract extraction. This study was undertaken to outline presentation of different types of lens induced glaucoma's, assess the intraocular pressure control and visual prognosis after small incision cataract surgery. study included 75 patients with different types of lens induced glaucoma's. The patients were followed up from the time of admission and surgery till 6weeks post-operatively and the factors influencing the final visual outcome were analyzed. Statistically Chi-Square test ( $\chi^2$ ) and Probability values (p) were used and p-value < 0.05 was considered statistically significant.

**Age Distribution:** In this study, age range was between 40 to 80 years. Highest number of cases occurred in the age group 61 TO 70 years (62.66%), Lahan study, has found occurrence of LIG in the age range of 40 to 80 years and highest in the 60 to 69 years (43.1%) age group, indicating that the lens induced glaucoma's are a condition of old age.<sup>7</sup> A study by Rijal AP and Karki DB has also found age of presentation of Lens induced glaucoma was between 46 to 78 years.<sup>8</sup> Another study done by Payal Gupta, Sudhir Bhagotra, Suraj Prakash also showed that maximum number of patients were in the age group of 61 to 70 years (56%)<sup>9</sup> Here  $\chi^2= 3.452$ , p-value=0.327 showing that no significant association existed between the age group of patients and the disease under study.

**Sex Distribution:** In this study, females are affected more as compared to males (76:24%) with ratio of 3.7:1. It is also found that the majority (80%) of cases occurred among lower socioeconomic strata in the society. Lahan study has reported female to male ratio of 1.7:1.<sup>7</sup> This finding in the study is also identical with study done by Payal Gupta, Sudhir Bhagotra, Suraj Prakash (56:44%) and with another study by Rijal AP and Karki DB (55:45%).<sup>8,9</sup>

**Socioeconomic Background:** All the patients who presented with LIG were from rural areas and of poor socioeconomic background. Most of the patients were

poor farmers. This might be one of the causes for late presentation with complications of cataract.

**Laterality:** All cases of lens induced glaucomas studied were unilateral. In 44 cases (58.67%) left eye was affected while in 31 cases (41.33%) right eye was affected.

**Duration of Symptoms:** In the study most of the patients had a complaint of DOV, redness, and pain in the affected eye. Fairly useful visual acuity achieved, in cases presented within 2 weeks (84%), whereas poor visual acuity of less than 6/60 was achieved in cases presented beyond 2 weeks (16%). In this study, duration of symptoms had a linear relation with best-corrected visual acuity at final follow up. More the delay in presentation, poorer was the visual outcome. Majority of the cases, 48 cases presented with pain and redness within the first week after developing the symptoms. 15 cases presented between 1 to 2 weeks and 12 cases presented beyond 2 weeks. The above data shows that most patients who neglected the loss of vision presented within a week of developing pain and redness. The Lahan study of 1998, found that duration of pain and high level of intra ocular pressure at presentation in phacomorphic group was associated with poor visual outcome at discharge, while in phacolytic group no such association were made out.<sup>7</sup>

**Status of Other Eye:** In the 75 cases, 45 cases (60%) presented with pseudophakia, 26 cases (34.67%) presented with either immature or mature cataract, while 4 cases (5.33%) were aphakic. Overall, 63 cases (84%) had fairly good vision in the other eye while the remaining 12 cases (16%) had poor vision in the other eye. Also  $\chi^2 = 31.438$ ,  $p\text{-value} = < 0.05$  for patients having good vision in other eye indicating the significant association between good vision in other eye and developing LIG. As a result of having fairly useful vision in the other eye, most of these patients neglected the other eye till they developed complication in the affected eye. This emphasizes on the importance of early treatment of other eye in patients with bilateral cataract.

**Diagnosis:** In this study series, it is observed that the most frequent type of LIG was PMG (92%) followed by PLG (08%), phacomorphic glaucoma has been the most frequent and commonest among all the studies including the present one. In this study, none of PMG occurred below 40 years of age, showing that phacomorphic glaucoma is a disease of old age with preponderance in 61-70 years age group, and the finding was consistent with study done by Payal Gupta, Sudhir Bhagotra, Suraj Prakash. and with another study by Rijal AP and Karki DB.<sup>9,8</sup> Ajab dabharde<sup>10</sup> in his study found that most frequent type of LIG was phacolytic glaucoma (76.6%) followed by phacomorphic glaucoma (23.4%) which is different than present study. This is perhaps because of

insidious onset, lack of medical awareness and limited resources in developing countries. No cases of phacoanaphylactic glaucoma and lens particle glaucoma were come across. Phacomorphic and Phacolytic glaucoma which are seen following neglecting the cataract till it attains hypermaturity and leads to glaucoma formed the main bulk of study. This emphasizes the importance of early detection and treatment of cataract.

**Visual Acuity:** In the 75 cases under study, 96% cases presented with only perception of light. 4% with hand movements only. BCVA of 6/12 or better was taken as good visual acuity, and less than 6/60 as poor visual outcome. In this study, BCVA of 6/12 or better is higher (64%) than Lahan study series (31.40%). There were a significant proportion of cases that had poor vision, with visual acuity less than 6/60 (16%) similar to Lahan study (21.0%).<sup>7</sup> Thus, in this study higher percentage of cases has achieved good visual recovery and slightly less percentage of cases have poor visual outcome when compared to Lahan study series. In a study by Rijal AP and Karki DB. slightly high percentage of patient have poor visual outcome (30%).<sup>8</sup>

**Intraocular Pressure:** Clinically, significant proportion of cases with IOP at presentation less than 40 mmHg (62.67%) achieved good visual acuity, than cases with IOP more than 40 mm Hg (37.33%). The correlation between height of IOP and visual outcome was, clinically significant but statistically not significant ( $p > 0.05$ ) The IOP at last follow up was reduced to normal limits in all cases, This indicates that, in lens induced glaucoma's IOP should be reduced by medical line of treatment preoperatively to as normal as possible, so as to achieve stable IOP post operatively with no further antiglaucoma medications. This finding was consistent with data from study done by Payal Gupta, Sudhir Bhagotra, Suraj Prakash<sup>9</sup> and with another study by Rijal AP and Karki DB.<sup>8</sup> And alike as it was found in Lahan study where post operative IOP after cataract surgery in 80.7% cases were below 21 mmHg.<sup>7</sup>

**Causes Of Low Visual Outcomes:** Main cause of poor visual outcome was optic atrophy in our study, i.e. 8 cases (10.5%)<sup>7</sup> which is less than earlier studies done at Lahan<sup>7</sup>, but similar to a study by Rijal AP and Karki DB<sup>8</sup> and the other studies at India. Other causes were macular degeneration, i.e. 2 cases and vitreoretinal disease. i. e. 2 cases.

## CONCLUSION

The following observations were made at the end of the study. Phacomorphic glaucoma is the most common type of Lens Induced Glaucoma accounting for 92% of the cases followed by phacolytic glaucoma with 8% of cases. with female preponderance. Majority of the patients had

good vision in the other eye as a result of which they neglected the affected eye till they developed LIG leading to pain during the time of presentation. Hence it is important to advise the patients regarding the early surgical treatment of cataract before they develop complications. Medical line of management had to be initiated before taking the patients to surgery to reduce the IOP and to relieve the symptoms. However medical line of management was temporary and surgery in the form of lens extraction was the definitive treatment. The visual recovery was fairly good in all those cases that have undergone treatment quite early. A sustained rise of pressure for a long time was a bad prognostic factor for post-operative development of good vision. Manual small incision surgery is safe and effective in controlling IOP and achieving good functional visual acuity in the management of LIG in developing countries. It is to be stressed upon, imparting health education and creating Awareness regarding cataract and its implications among the rural community, ophthalmic assistants and peripheral health workers.

## REFERENCES

1. Thylefors B, Negrel AD, Pararajasegaram R, Dadzie KY. Global data on blindness. Bull World Health Organ. 1995;73:115-21
2. Murthy GV, Gupta SK, Bachani D, Jose R, John N. Current estimates of blindness in India. Br J Ophthalmol. 2005;89:257-60
3. Thulsiraj RD, Nirmalan PK, Ramkrishanan R, Manimekalai TK, Baburajan NP, et al. Blindness and vision impairment in a rural south Indian population: The Arvind Eye Survey. Ophthalmology. 2003;110:1491-8. (PubMed)
4. Thulsiraj RD, Rahamtulla R, Saraswati A, Selvaraj S, Ellwein LB. Thesivaganga eye survey: I. Blindness and cataract surgery. Ophthalmic Epidemiol. 2002;9:299-312
5. Thulsiraj RD, Nirmalan PK, Maneksha V, Rahamthulla R, Ramkrishanan R, Padmavathi A, et al. A population based eye survey of older adults in Tirunelveli district of south India: Blindness, cataract surgery and visual outcomes. Br J Ophthalmol. 2002; 86:505-12.
6. Tomey KF, al-Rajhi AA. Neodymium:YAG laser iridotomy in the initial management of phacomorphic glaucoma. Ophthalmology. 1992;99:660-5 (PubMed)
7. Pradhan D, Hennig A, Kumar J, Foster A. Prospective study of 413 cases of lens induced glaucoma in Nepal. Indian J Ophthalmol. 2001;49(2):103-7
8. Rijal AP, Karki DB. Visual outcome and IOP control after cataract surgery in lens induced glaucomas. Kathmandu University Medical Journal 2006,4(13):30-33
9. Payal Gupta, Sudhir Bhagotra, Suraj Prakash. Pattern and Visual Outcome in Lens induced Glaucoma. JK SCIENCE 2012;14(4):181-184
10. Ajab C. Dhabarde. Clinical study of lens induced glaucoma in rural hospital. Available at :[www.researchgate.net / publication / 232985922\\_lens\\_induced\\_glaucoma\\_paper](http://www.researchgate.net/publication/232985922_lens_induced_glaucoma_paper). Accessed on June 2013

Source of Support: None Declared  
Conflict of Interest: None Declared