



Clinical Study of Visual out Come of Lens Induced Glaucomas

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Abstract

During the period of september 2012 to october 2013, we selected 100 patient of lamp induced glaucomas, to study the visual outcome after temporay management medically followed by surgery and weekly follow up. This study was taken in Regional eye hospital kurnool, kurnool medical college kurnool All 100 patents of LIG; were in patients.

For temporary medical management, to reduce IOP in to operable level, we used carbonic anhydrase inhibitor,(A cetazolamide 250 mg) Beta block as (Timolol maliate 0.5%), mydriatics (phenylepherine 20%),mioties(pilo carpinea 2%), followed by further use of steroids to reduce uveitis. And finally symptomatic treatment like antibiotic. Sedetive, anti inflammatory analgesic and anti pyretics were used.

Under 20% xylocaine local anesthesia by peribulbar and facial blocks for LIG cases we did extracapsular cataract extraction(ECCE), intracapsular cataract extractiono(ICCE); small incision cataract surgery(SICS) accordingly IOL(Intra ocular lens implantation done.

In hundred patient of LIG'S the finaly results were as follows, between 66-75 years of patients (40%)

commonly affected; left eye incidences are more 62 patients (62%), phacomorphic glaucoma were 68% phacolytic glaucoma were 24%, lens particle glaucoma 4%, subluxations and dislocation of lens 4 % symptomatic cases with in one week duration 58 cases, 58% noticed.

Pre operative maximum Iop was > 40 mm of Hg in 34 cases 34%

Out of 58 cases 62% had good visual prognosis and 24% had usefull visual prognosis, 10 cases had poor visual prognosis, 1% had total loss of vision.

Statistically, chi-square test (χ^2) and probability values (P) were used.

P, value less than <0.05 was considered significant.

So finally to conclude in our study, we achieved good visual prognosis with in 1 week duration of the LIG patients. So early detection of the LIG and management given BCUA 62%

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 fibres to the ciliary body between the iris and vitreous body.

It is enclosed in a capsular bag and lies in the patellar fossa. With a cataract backlog of around 12 million and annually increasing at an estimated rate of 3.8 million, it is not surprising that the occurrence of lens induced glaucoma (LIG) isn't an infrequent event in India.

Lens induced glaucoma (LIG) due to hyper mature cataracts are an important cause of secondary glaucoma in the developing world. There is an ever increasing backlog of cataract due to the population explosion, increased life expectancy and low productivity interms of utilization of the available surgical services.

Glaucomas in which the lens plays a role, either by size or by position or by causing inflammation have been classified as lens induced glaucomas.

Abnormalities of crystalline lens may incite elevation of intraocular pressure often accompanied

by intraocular inflammation, these are known as phacogenic or lens induced glaucomas.

There are heterogenous group of uncommon maladies, which can develop through either open angle or angle closure mechanisms.

Phacolytic glaucoma and lens particle glaucoma are secondary open angle glaucomas.

The iridocorneal angle is open and there is blockage of the trabecular meshwork by lens proteins.

Phacomorphic glaucoma and lens displacement glaucomas are secondary angle closure glaucoma.

Phacoanaphylactic uveitis, now termed as lens induced uveitis, isn't truly an anaphylactic reaction but is a granulomatous reaction that can result in glaucoma with either open angle, angle closure or combined mechanism.

Though historically intracapsular cataract extraction has been the preferred technique for these lens induced glaucomas, there is perceptible shift towards the manual small incision cataract (SICS) extraction in the recent times. Reports of the safety of posterior chamber intraocular lens following a planned manual SICS in phacolytic glaucoma, lend credence to this modern mode of management.

Such surgeries undertaken within a day or two after onset of symptoms have been shown to be effective in controlling IOP and restoring vision. 2 Whatever be the mode of surgical intervention, the prognosis for good postoperative visual recovery in these conditions remains guarded, unless diagnosed early and managed efficiently.

Hence the present study was undertaken and aimed at a clinical study of various lens induced glaucomas & their management, post operative visual outcome and intraocular pressure control as practiced in the department of ophthalmology, Regional Eye Hospital, Kurnool Medical College, Kurnool

MATERIALS AND METHODS

The aim of the dissertation is to study the incidence, mechanism, management and prognosis of cases of lens induced glaucoma. All the cases studied were admitted and treated at the ophthalmic ward, REGIONAL EYE HOSPITAL, KURNOOL MEDICAL COLLEGE, KURNOOL.

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 100 patients were those who attended the inpatient department of REGIONAL EYE HOSPITAL, KURNOOL MEDICAL COLLEGE, KURNOOL and were diagnosed to be having lens induced glaucoma.

Inclusion criteria:

The following criteria were applied to clinically diagnose the various type of lens induced glaucomas.

1. Phacomorphic glaucoma:

- a. Shallow anterior chamber
- b. Intumescence of mature cataract
- c. IOP raised

2. Phacolytic glaucoma:

- a. Deep anterior chamber
- b. Hypermature cataract
- c. Raised IOP
- d. Varying degree of aqueous flare and cells and no KP's

3. Phacotoxic Uveitis/Lens particle Glaucoma:

- a. Hypermature cataract
- b. Traumatic rupture of lens capsule

Or

Postoperative retained lens matter

- c. Mild to moderate signs of iridocyclitis, deep anterior chamber.
- d. Very few (or) no KP's

4. Phacoanaphylactic

Uveitis with secondary glaucoma:

- a. History of cataract surgery

(Or)

injury to lens

- b. Very severe clinical picture of iridocyclitis
- c. Large number of mutton fat like K.P's

5. Glaucoma secondary to ectopia lentis:

- a. Anterior (or) posterior dislocation
- b. Lens across pupillary plane
- c. Raised IOP

Exclusion criteria:

1. Cases of primary glaucoma associated with cataract

2. Cases of lens induced glaucomas with significant anterior and posterior segment pathology.
3. Aphakic and pseudophakic glaucoma
4. Other associated glaucomas with cataract such as pseudo exfoliation glaucoma etc.

Sampling size and methods:

A minimum of 100 patients 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 REGIONAL EYE HOSPITAL, KURNOOL MEDICAL COLLEGE, KURNOOL during the period of September 2012 to October 2013.

Patient evaluation:

All the 100 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 of previous surgery in the eye was enquired.

In physical examination of all these 100 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 schiottz tonometer and GAT. The readings were taken to establish the final IOP. In cases where there was corneal oedema, IOP was measured after reducing the pressure with I.V mannitol. B-Scan was done in the affected eye as the fundus was not visible to rule out posterior segment pathology.

A detailed examination of other one was done. Other routine tests like lacrimal syringing. A scan biometry, urine sugar 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 anti-glaucoma medication and drugs for reducing associated features. Oral analgesics given in majority was tab. Diclofenac sodium, intramuscular injections was preferred if patient had associated vomiting.

Mydriatics were used in cases with open angle mechanism type of glaucoma. 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 1mg/kg bodyweight/day To reduce the IOP Inj. Mannitol 20% 2.5 to 7.0ml/kg body weight was given I.V bd along with oral acetazolamide 500 mg strap followed by 250mg 6th hourly.

This was supplemented with topical B-blockers preferably 0.5% timolol maleate eye drops bd. Supportive management consisted of antiemetics as such inj. Domperidone i.v. to reduce vomiting.

Preoperative management:

Prior to surgery IOP was recorded in all patients and if the IOP was still raised Inj.

Mannitol 20% 350ml was given bd at a rate of 50 drops/min over a period of 30 min along with oral tab. Acetazolamide 500 mg stratum 250 mg qid maintenance in refractory cases on the day of surgery an additional IV mannitol 350ml was given over a period of 30 min.

Pre-operatively pupils were dilated with combination of tropicacyl (0.08% (and phenylephrine (5%) eye drops instilled every 15 min until the pupils are dilated. 1 drop of flubriprofen (0.03%) eye drops were instilled ½ hourly 3 times preoperatively to prevent intraoperative miosis.

Surgical Management: Following control of IOP patient was operated for lens extraction. The surgery was manual small incision cataract surgery with PC

IOL implantation under local (peribulbar) anaesthesia, suitable modifications in the surgical steps were made according to the situation encountered.

Technique of surgery:

Peribulbar injection of lignocaine was given using a 24 G 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 2 mm away from the superior limbus using a 11 no surgical blade, the length of the incision was 6 mm
- Using an angled crescent blade a sclero corneal tunnel was made upto 1.5 mm into the clear cornea.
- A side port was made using a 150 side port entry blade at the 90 clock (or) the 30 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 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 3.2 mm angled Keratome and internal

opening enlarged using a 5.2 mm angled keratome.

- Hydrodissection was done using a 27G 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 into the capsular bag or in the sulcus.
- Minimal AC wash done to remove the viscoelastic material
- Wound closed by hydrating the side port
- Sub conjunctival injection of gentamycin and dexamethasone was given.
- Any complications that occurred during the surgery was noted down.

RESULTS

Table – 1 Age Distribution

Age in Yrs	55 yrs	65 yrs	75 yrs	Age in Yrs
45	56	66	>75 yrs	45
Male	6	14	18	4
Female	14	18	22	4
Total	20	32	40	8

$\chi^2 = 9.632$, p- value = 0.278

Among the 100 cases that were included in the study, majority of the cases were in the age group of 66-75 yrs (40%). The youngest case in the study group was 52 yrs old, while the oldest was 81 yrs old.

Table – 2 Sex Distribution

Sex	No.of Cases	Percentage
Male	42	42
Female	58	58
Total	100	100

The incidence of lens induced glaucomas was slightly higher in females than males

Table – 3 Eye Affected

Eye affected	No.of Cases
RE	38
LE	62

$\chi^2 = 19.321$ and p-value = 0.9

Table – 4 Duration Of Symptoms

Duration	No.of Cases
< 1 week	58
1.1-2 weeks	22
>2.1 weeks	20
Total	100

Out of the 100 cases, 58 cases presented within the first week and 22 cases within 2nd weeks and rest presented within 3 weeks after development of symptoms.

Table – 5 Aetiological Diagnosis

Aetiological Diagnosis	No.of Patients	Percentage
Phacomorphic Glaucoma	68	68
Phacolytic Glaucoma	24	24
Lens Particle glaucoma	4	4
Phacoanaphylactic glaucoma	0	0
Subluxation / dislocation	4	4

$\chi^2 = 15.007$ and p-value = 0.001

Out of 100 cases, 68 cases were diagnosed as phacomorphic glaucoma, 24 cases were of phacolytic glaucoma 4 each of phacotoxic and glaucoma secondary to subluxation/dislocation of lens.

Table – 6 Condition Of The Other Eye

Condition Of The Other Eye	No. of Patients	Percentage
Normal	2	
Immature/Mature cataract	42	
Pseudophakia	44	
Aphakia	12	

$\chi^2 = 39.566$ and $p\text{-value} = 0.1$

In the 100 cases 44 cases presented with pseudophakia, 42 cases presented with combined immature and mature cataract, 12 cases were aphakic and normal crystalline lens was found in one case.

Table – 7 Vision In Other Eye

BCVA	No. of Patients	Percentage
6/6-6/12	28	28%
6/18-6/60	32	32%
>6/60	40	40%

Table – 8 Preoperative Iop

	20-30 mm Hg	30-40 mm Hg	>40 mm Hg
Phacomorphic	04	30	34
Phacolytic	02	08	14
Lens particle	-	02	02
Phacoana phylactic	-	-	-
Displaced lens	-	-	04
Total	06	40	54

$\chi^2 = 8.761$ and $p\text{-value} = 0.1$

A total of 6 cases presented with IOP < 30 mm Hg, 40 cases with IOP < 30 mm Hg, 40 cases with IOP between 30-40 mm Hg. Rest of the cases presented with IOP > 40 mm Hg, the highest pressure recorded during the study was 78 mm Hg.

Table – 9 PCR with VL

PCR with VL	No.of Cases
Phacomorphic	06
Phacolytic	04
Phacotoxic	02
Phaco anaphylactic	-
Subluxation / dislocation	-
Total	12

$\chi^2 = 7.053$ and $p\text{-value} = 0.1$

Out of the 100 cases operated, intra operative complications was noted in 12 cases in the form of PCR with vitreous loss

Table – 10 AC Reaction

AC Reaction	No.of Cases
Phacomorphic	06
Phacolytic	12
Phacotoxic	04
Phaco anaphylactic	-
Subluxation / dislocation	-
Total	23

.On the first postoperative day, AC reaction in the form of flare, cells, exudative membrane as hypopyon was found in 22 cases out of 100 cases operated, 12 of these cases are phacolytic glaucoma, 6 cases were of phacomorphic glaucoma and 4 cases were of phacotoxic glaucoma.

Table – 11 Duration Of Symptoms And Final BCVA

	6/6-6/12	6/18-6/60	>6/60
< 1 week	36	14	08
1-2 weeks	8	10	04
>2 weeks	0	10	10
Total	44	34	22

$\chi^2 = 19.533$ and $p\text{-value} = 0.001$

Out of 58 cases who presented within 1 week, 62% had good BCVA while 24% had useful vision. Out of 22 cases presented between 1-2 weeks in which 8 cases (36.36%) had good BCVA, 10 cases (45.45%) had useful vision while 10 cases (45.45%) had poor vision. In 20 cases (20%) who presented later than 2 weeks, 10 cases (50%) had useful vision and 10 cases (50%) had poor vision.

Table – 12 Pre Op Iop And Final BCVA

IOP (in mmHg)	6/6 - 6/12	6/18 - 6/60	>6/60	Total
22-30	4	0	2	6
30-40	20	12	8	40
>40	20	22	12	54

$\chi^2 = 17.956$ and $p\text{-value} = 0.04$

Out of 6 cases, who presented with IOP less than 30 mm Hg, 4 cases had a good BCVA at the end of 6 weeks, remaining 2 cases had poor vision. In 40 cases that presented with IOP between 30-40 mm Hg, 20 cases had good visual acuity while 12 cases had fairly useful vision and 8 cases had poor vision. Out of 54 cases that presented with IOP > 40 mm Hg, 20 cases had good vision, 22 cases had fairly useful and remaining 12 cases had poor vision.

DISCUSSION

Lens induced glaucomas are a common occurrence in India, hardly surprising in a situation where the incidence of cataract cases far exceeds the total number of surgeries performed currently. The reason for increased incidence of lens induced glaucomas in India may be due to late presentation, as a result of inaccessibility of ophthalmic services to remote rural areas, lack of awareness and economic resources.

This longitudinal study was undertaken to outline the different characteristics of glaucoma's to determine the risk factors and their consequences on post-operative visual acuity, intraocular pressure, inflammation including corneal changes.

This study included 100 patients with different lens induced glaucomas. The patients were followed up from the time of admission and surgery till 6 months post operatively and the factors influencing the final visual outcome were analyzed. Statistically, Chi-square test (χ^2) and probability values (p) were used and $p\text{value} < 0.05$ was considered statistically significant.

Age distribution:

In this study, age range was 52-81 years with a mean age of 59.57 ± 7.96 years. Highest number of cases occurred in the age group 66-75 years (40%). Lahane study has found occurrence of LIG in the age range of 40-80 years and highest in the 60-69 years (43.1%) age group indicating that the lens induced glaucomas are a condition of oldage. Here $\chi^2 = 9.632$ $p\text{ value} = 0.278$ showing that no significant association existed between the age group of patient and the disease under study.

Sex Distribution:

In this study females seemed to have an increased risk of having LIG compared to males with ratio of 1.7:1. It also found that the majority (77.78%) of cases occurred among lower socio economic status in the society. A study done at madurai in 1994 found marginally significant increased risk of having these glaucomas in females ($p=0.05$). Lahane study has reported females to male ratio of 1.7:1 though it is possible that these entities are more common in females because of socio economic constraints we also have to consider the fact that the prevalence of cataract itself is more common in females than males. This finding was consistent with data from the Punjab study in India

Socio-Economic background:

All the patients who presented with LIG were from rural areas and of poor socio economic background. Most of the patients were daily wage workers. This might be one of the causes for later presentation with complications of cataract.

Duration of symptoms:

Good visual acuity achieved in cases presented with in 1 week (62.06%) was more than the cases presented beyond 2 weeks (12.5%) where as poor visual acuity of less than 6/60 was more in cases presented beyond 2 weeks (50%). 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 which was both clinically and statistically significant ($p=0.001$). Majority of the cases (58%)

presented with pain and redness within the first week after developing the symptoms.

The rest of cases presented after 1 week. The above data shows that most patients who neglected the loss of vision presented within a week of developing pain and redness.

The Lahane study of 1998 found that duration of pain and high level of intraocular pressure at presentation in phacomorphic group was associated with poor visual outcome at discharge while in phacolytic group no such association were made out.

Status of other eye:

In the 100 cases, 44 cases presented with pseudophakia 42 cases presented with immature or mature cataract, 2 cases have normal crystalline lens in the other eye further 12 cases are aphakic.

Though clinically significant but not statistically ($X^2 = 39.56$ and p value = 0.1) indicating that the patients having pseudophakia or normal crystalline lens or aphakic in the other eye formed a major bulk of this study.

Overall 60 cases are fairly good vision in the other eye while the remaining 40 cases had poor vision in the other eye. Also $X^2 = 14.980$ p value = 0.002 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 develop complication in the affected eye.

This emphasizes on the importance of early treatment of other eye in patients with bilateral cataract

Type of lens induced glaucoma:

In this study series, it is observed that the most frequent type of Lens induced glaucoma was Phacomorphic glaucoma (68%) followed by Phacolytic glaucoma (24%) similar occurrence was noted by madurai study (52.68%) and Lahan study (72%) occurrence of various lens induced glaucomas in the above studies shows variations. Nevertheless phacomorphic glaucoma has been the most frequent and commonest among all the studies including the present one.

In this study none of Phacomorphic glaucoma occurred below 50 years of age showing that phacomorphic glaucoma is a disease of old age with preponderance in 50-60 years age group and the finding was consistent with the 1991 Delhi study. This is perhaps because of insidious onset, lack of medical awareness and limited resources in developing countries. While lens particle glaucoma and glaucoma secondary to subluxation / dislocation constituted the remaining 8%. No cases of phacoanaphylactic glaucoma were come across indicating the refinement of cataract surgery. Phacomorphic and phacolytic glaucoma which are seen following neglecting the cataract till it attains hypermaturity and leads to glaucoma formed the main bulk of cases constituting 92% of cases. This emphasizes the importance of early detection and treatment of cataract.

Visual acuity:

In the 100 cases under study 94% cases presented with only perception of light 4% hand movements only and 2% with counting fingers close to the face. 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 slightly higher (44%) than Lahane study series (31.40%).

There was a significant proportion of cases that had poor vision with visual acuity less than 6/60 (22%) similar to Lahane study (21.0%). Thus in this study higher percentage of cases has achieved good visual recovery and almost equal percentage of cases have poor visual outcome when compared to Lahane study. BCVA in this study of 6/12 or better was low (44%) and poor vision of less than 6/60 was higher (22%) compared to Madurai study with 59.13% and 11.82% respectively.

In this study good visual acuity achieved by cases with phacolytic glaucoma (53.33%) was more than phacomorphic glaucoma (37.04%) this difference was clinically significant but statistically not significant ($p > 0.05$). Poor outcome of $< 6/60$ showed no significant difference between Phacolytic glaucoma (26.67%) and phacomorphic glaucoma (29.63%) 1994 Madurai study series found no statistical difference between the two groups on the final post operative visual recovery ($p=0.68$).

Intraocular pressure:

In an effort to study whether the mechanism of secondary glaucoma has any bearing on IOP. The following observations are made. Clinically significant proportion of cases with IOP at

presentation, <30 mm Hg (67%) achieved good visual activity, than cases with IOP >40mm Hg (20%) where as no significant difference was found for poor outcome. The correlation between the height of IOP and visual outcome was clinically significant but statistically not significant ($P>0.05$). Madurai study also had found no statistically significant association between the level of preoperative IOP and final visual acuity.

The significant reduction in IOP after treatment was found in 60.00% and at last follow up IOP reduction to baseline was achieved in 92% to be clinically and statistically significant. It is found that, the reduction in mean IOP is greater after medication for glaucoma. Nevertheless surgical removal of lens is the definite treatment of lens induced glaucoma, response to medication is very good in LIG.

The IOP at last follow up was reduced to normal limits "(16.44 + 6.54 mm Hg). This indicates that in lens induced glaucomas. IOP should be reduced by medical line of treatment preoperatively to as normal as possible to avoid complications on the table.

There was no significant difference in IOP among LIG subgroups both clinically and statistically.

In Lahane study of 1998 IOP at presentation ranged from 14 to 18 mm Hg. 79.2% eyes had an IOP of > 30 mm Hg and 14.3% <22 mm Hg as they had already received medical antiglaucoma treatment elsewhere. After medication for glaucoma 66.2% had an IOP <21 mm Hg and 96.8% had an IOP < 30 mm Hg. Following surgery 80.7% had an IOP of 21 mmHg (or) less at discharge.

Lahane study has achieved slightly better IOP control than our study especially after antiglaucoma

medication. Madhurai study reported IOP range of 22-70 mm Hg with marginally higher for phacomorphic than of phacolytic glaucoma. After hypotensive medications 60% had an IOP of <30mm Hg. The IOP was controlled in 95% of patients (<21 mm Hg) without the need for any antiglaucoma medication. Their study results are similar to the present studies findings.

The 1991 Delhi study on phacomorphic glaucomas was not able to control IOP in 37.5% eyes. The 1990 study of vellore on phacolytic glaucoma has found no significant correlation between duration of symptoms and presenting IOP, as in present study. A weak positive relation was found between duration of symptoms and the best controlled pre-operative IOP, similar to the present study.

Optic disc changes:

Optic disc at last follow up in the affected eyes was normal in majority (36.00%). There were 6 cases of cystoid macular oedema and media was hazy in 2 cases. Glaucomatous changes in disc damage was found in 52% cases.

Though clinically significant disc changes was found more in Phacomorphic glaucoma (57.7%) than Phacolytic glaucoma (33.33%) the difference was statistically not significant ($P>0.05$). BCVA at last follow up, correlated with fundus changes has shown that the good visual acuity achieved in normal fundus was significantly high than cases with GDD. And poor visual acuity in cases with GDD was definitely high (52%) as none of the cases with normal fundus and poor visual acuity. These differences were clinically and statistically significant ($P=0.000$).

In Madhurai study 5 patients (10.2%) with phacomorphic glaucomas and 6 patients (13.6%) with phacolytic glaucomas had visual acuity $< 6/60$. All these 5 patients with phacomorphic glaucomas and 4 of the 6 patients with phacolytic glaucomas had compromised optic nerves due to the glaucomatous process itself, showing close association with our study inference. In Lahane study series, the percentage of optic atrophy cases (34%) is comparatively high from our study (15.56%).

SUMMARY

The present clinical study of lens induced glaucomas, was conducted in Regional Eye Hospital, Kurnool Medical College, Kurnool from September 2012 to Oct 2013.

The main objective of this study were to determine the characteristics, the risk factors and their consequences on postoperative visual outcome, intraocular pressure and optic disc changes.

The study sample included 100 cases of LIG admitted in the above mentioned hospital.

The occurrence of LIG in hospital during the study period was 1.87%. The age range was 52-81 years with the mean age of 61.57 years.

The most frequent type of LIG was phacomorphic glaucoma followed by phacolytic glaucoma. The other subgroups included 4 cases of lens particle glaucoma and 4 cases of anterior displacement of lens with pupillary block glaucoma.

The size of these other sub groups was very small to extrapolate the results on these subgroups. None of the lens induced glaucomas in the present study had vision more than hand movement at presentation.

The BCVA of 6/18 (or) more was found in 34% cases, and 6/12 or better in 44% cases, where as visual acuity of $< 6/60$ was seen in 22% of cases.

Good visual acuity of 6/12 or better achieved at last follow up, was more in Phacolytic glaucoma (57%) than Phacomorphic glaucoma (50%) which was clinically significant but statistically not significant ($p > 0.05$) the cause for poor vision in some cases were due to severe post operative inflammation, bullous keratopathy, cystoids macular oedema and glaucomatous optic atrophy, good visual acuity achieved in cases with IOP of < 35 mm Hg compared to cases with IOP higher than 35 mm Hg.

There was clinically significant reduction of mean IOP after medication and also at last follow up from the baseline IOP at the mean reduction of IOP from post medication to last follow up was also found to be clinically and statistically significant.

The ocular fundus of the affected eye suffered GDD in 40% of the total cases in which the damage was more in Phacomorphic glaucoma than Phacolytic

CONCLUSIONS

Results have shown that

1. Lens induced glaucomas were more common in age group of 60-69 years.
2. Lens induced glaucomas were more common in females,
3. Good visual acuity can be achieved in LIG presenting within two weeks, with intra ocular pressure of < 35 mm Hg and with meticulous control of intraocular pressure and inflammation with medications preoperatively.

4. Planned ECCE (or) SICS with IOL implantation with minimal tissue handling, a good follow up with efficient management of attendant complications and inflammation are the key factors in the management.

In other words a delay in presentation of > 2 weeks, and intraocular pressure of > 35 mm Hg would result in severe inflammation affecting the optic nerve. The cause of poor vision in 12 cases (24%) were due to severe postoperative inflammation, bullous keratopathy and cystoid macular edema which would ultimately jeopardize vision, in these potentially blinding lens induced glaucomas.

It is to be stressed upon, imparting health education and creating awareness regarding cataract and its implications among the rural community ophthalmic assistant and peripheral health workers. This study has highlighted the characteristics, risk factors and their consequences in LIG and also the importance of early diagnosis, and efficient medical management to control IOP and inflammation with meticulous surgery and IOL implantation and also proficient postoperative management and follow up would probably achieve excellent visual prognosis.

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