Research Paper

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# Visual Prognosis, Intraocular Pressure Control and Complications in Lens Induced Glaucoma (LIG) Following Manual Small Incision Cataract Surgery

Medical Science

**KEYWORDS :** visual prognosis, lens induced glaucoma,intraocular pressure, curable and avoidable blindness, timely intervention.

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## ABSTRACT

***Aim :*** *To evaluate visual prognosis, intraocular pressure control and complications following manual small incision cataract surgery in eyes with Lens Induced Glaucoma.*

***Materials and methods:*** *This prospective observational study was conducted on 40 patients with lens induced glaucoma from August 2010 to July 2011 at Government Medical College,a tertiary centre. Forty cases presenting with symptoms and signs of lens induced glaucoma were included in the study. All patients underwent slit lamp examination, schiotz tonometry ,gonioscopy, visual acuity assessment and routine investigations pre-operatively. Intraocular pressure was brought under control with topical and systemic anti-glaucoma therapy before surgery. All patients underwent manual small incision cataract surgery.*

***Results :*** *A total of 40 eyes with lens induced glaucoma were included in this study. 87.5 % (35 eyes) cases were ≥ 60 years of age, eldest was 81 years and youngest was 40 years old. Females were 60% (24 eyes) and males were 40% (16 eyes).Pre-operative visual acuity was only perception of light projection of rays in 92.5% (37 eyes). Faulty projection of rays was in 7.5% (3 eyes). Pre-operative mean intraocular pressure was 37.25 mm of Hg and post-operative mean intraocular pressure was 18.07 mm of Hg. There was a clinically significant difference between intraocular pressure at presentation and intraocular pressure at last follow up. Final post-operative visual acuity was ≥ 6/18 in 37.5% (15 eyes) and <6/18 to 6/60 in 37.5 %( 15 eyes). Thus 75% (30 eyes) cases had improved visual acuity to clinically significant level. Visual acuity was < 6/60 to 3/60 in 5% (2 eyes) cases, 20% (8 eyes) cases had visual acuity of <3/60 to finger counting close to face.*

*Conclusion : To conclude the blindness due to lens induced glaucoma is avoidable and curable by timely intervention but there is need to increase the awareness of this condition in general population.*

**Introduction :**

Cataract has been documented to be the most significant cause of bilateral blindness both in India as well as globally [1,3] .Cataract extraction remains the only definite treatment for cataract. Late reporting for treatment of cataract leading to serious complications like lens induced glaucoma (LIG) remains one of the most important cause of irreversible loss of vision. This preventable and curable condition, though rare in developed countries, is unfortunately still prevalent in India. LIG is a distinct pathological entity, clinically recognizable, easily preventable and often curable by cataract extraction [1,5] LIG may occur as either secondary angle closure glaucoma or open angle glaucoma. Dislocation or swelling of lens can cause papillary block and subsequently angle closure glaucoma ( phacomorphic LIG). Leakage of soluble lens proteins from a relatively intact cataractous lens can result in a severe secondary open angle glaucoma (phacolytic LIG). Heavy molecular weight proteins believed to be of lens origin can directly obstruct the trabecular outflow pathway. After extracapsular cataract extraction surgery or after lens trauma, liberated fragments of lens material may mechanically impair the drainage of aqeous humour through the outflow channels (lens particle LIG). With proper recognition these glaucomas can be prophylactically cured by the cataract extraction [2,10]. If not recognized in time cataract surgery in LIG poses several challenges .The high intraocular pressure increases the risk of expulsive hemorrhage, positive pressure and posterior capsular rent. There is often zonular dialysis which makes surgery more difficult. Manual small incision cataract surgery is popular in developing countries as it is inexpensive and possible in all types of cataract including intumescent and lens induced glaucoma without compromising the quality of eye care [9]. The aim of present study was to evaluate visual prognosis, intraocular pressure control and complications following manual small incision cataract surgery in eyes with lens induced glaucoma.

**Materials and methods:**

This prospective observational study was conducted on 40 patients with lens induced glaucoma from August 2010 to July 2011 at Government Medical College ,a tertiary centre. Forty cases presenting with symptoms and signs of lens induced glaucoma attending outpatient department and casualty were included in the study. Patients with no perception of light, pre-existing glaucoma, psudoexfoliation and other conditions affecting visual acuity were excluded from the study. All patients underwent slit lamp examination, schiotz tonometry ,gonioscopy, visual acuity assessment and routine investigations pre-operatively. Intraocular pressure was brought under control with topical and systemic anti-glaucoma therapy before surgery. Inflammation was brought under control with topical corticosteroid –antibiotic preparations. Cycloplegics were used to control anterior chamber reactions in phacolytic glaucoma cases. All patients underwent manual small incision cataract surgery with posterior chamber intraocular lens implantation. All surgeries were performed by first author. Informed and written consent was taken. Ethical review board of Medical College approved the study. Intravenous Mannitol 20% was given in all patients one hour prior to the surgery. Visual acuity assessment, intraocular pressure measurement, slit lamp examination, indirect Ophthalmoscopy , were carried out on 2nd day, 1 week ,1 month and 3 months from the day of the surgery and complications were observed. Post- operative corticosteroid-antibiotic topical drops were given 6 hourly in tapering doses for the period of 6 weeks, topical anti-glaucoma therapy was given twice in a day for the period of 1 week, oral acetazolamide 250 mg was given twice in a day for 3 days in all patients.

**Results :**

A total of 40 eyes with lens induced glaucoma were included in this study. 87.5 % (35 eyes) cases were ≥ 60 years of age, eldest was 81 years and youngest was 40 years old. Females were 60% (24 eyes) and males were 40% (16 eyes).Pre-operative visual acuity was only perception of light projection of rays in 92.5% (37 eyes). Faulty projection of rays was in 7.5% (3 eyes). Phacomorphic glaucoma was seen in 85% (33eyes), phacolytic glaucoma was evident in 15% (6 eyes).(table 1). All patients underwent manual small incision cataract surgery. Posterior chamber intraocular lens implantation was done in 82.5% (34 eyes) cases. 15% (6 eyes ) cases were kept aphakic due to posterior capsular rent and zonular dehiscence , Primary scleral fixated intraocular lens implantation was done in 2.5%(1 eye) cases due to zonular weakness. Iridodialysis occurred in 2.5 % (1 eye) cases which was managed intra-operatively.(table 2) Pre-operative mean in-

traocular pressure was 37.25 mm of Hg and post-operative mean intraocular pressure was 18.07 mm of Hg.(table 3) There was a clinically significant difference between intraocular pressure at presentation and intraocular pressure at last follow up. Final post-operative visual acuity was ≥ 6/18 in 37.5% (15 eyes) and <6/18 to 6/60 in 37.5 %( 15 eyes). Thus 75% (30 eyes) cases had improved visual acuity to clinically significant level. Visual acuity was < 6/60 to 3/60 in 5% (2 eyes) cases, 20%(8 eyes) cases had visual acuity of <3/60 to finger counting close to face.(table 4)

**Table 1: pre-operative demographic characteristics of the study population.**

| | |
|---|---|
| Age in years<br>Mean<br>Range | <br>63.32<br>40 to 81 |
| Gender<br>Male<br>Female | <br>16(40%)<br>24(60%) |
| Pre-operative visual acuity<br>PLPR<br>Faulty PR | <br>37(92.5%)<br>03(7.5%) |
| IOP in mmHg<br>Mean<br>Range | <br>37.25<br>23.1 to 61.1 |
| Type of Lens induced glaucoma<br>Phacomorphic<br>Phacolytic<br>Lens particle | <br>34(85%)<br>06(15%)<br>0(0%) |
| | |

PLPR= perception of light,projection of rays.

**Table 2: complications during small incision cataract surgery**

| Name of the complication | Number ( % ) |
|---|---|
| Iridodialysis | 1(2.5%) |
| Zonular weakness | 1(2.5%) |
| Posterior capsular rent | 2(5%) |
| Zonular dehiscence | 4(10%) |

**Table 3: showing post-operative intraocular pressure**

| Intraocular pressure in mmHg | |
|---|---|
| Mean<br>Range | 18.07<br>14.6 to 24.4 |

**Table 4: Post- operative Best corrected visual acuity**

| Best corrected visual acuity | No (%) |
|---|---|
| ≥ 6/18 | 15(37.5%) |
| <6/18 to 6/60 | 15(37.5%) |
| <6/60 to 3/60 | 02(5%) |
| <3/60 to Finger counting close to face | 08(20%) |

**Discussion :**

Lens induced glaucoma is a preventable and curable condition [1,5]. Early detection and treatment by cataract extraction can save many eyes from the blindness. We are running in era of femtosecond assisted cataract surgery with advanced toric multifocal intraocular lens implants for total visual rehabilitation of the patients. Till in developing country like India we had notifiable number of lens induced glaucoma (40) cases in one year at a single referral centre. So there could be many more cases all over the country which are not recognized and requires vigorous identification to help India to decrease the backlog of the blindness. In present study 87.5% cases were ≥60 years of age , may be due to negligence or lack of care on the part of the patient or relatives or may be due to lack of services or lack of knowledge or poverty. Distribution of patients with lens induced glaucoma had highlighted discrimination and neglect towards old patients and females. Females were 60% outnumbered males could be due to negligence of problems of females. Pre-operative visual acuity was only perception of light in 92.5% cases and faulty projection of rays in 7.5 % cases. After cataract surgery 75% patients were visually rehabilitated. In 15% cases we could not implant posterior chamber intraocular lens due to zonular dehiscence and posterior capsular rent during cataract surgery. In 5% cases visual acuity was < 6/60 up to 3/60. Unfortunately 20% cases were not improved beyond finger counting close to face due to corneal decompensation,corneal odema , glaucomatous optic atrophy, because of late presentation. The study by Pradhan D et al [8] visual acuity was hand movements to perception of light and projection of rays (PLPR ) in all patients at presentation, at last follow up 38.6% achieved ≥6/60,31.2% achieved < 6/60 and 30.2% were < 3/60. Another study by R Ramkrishnan et al [9] final best corrected visual acuity was 20/40 (6/12) in 68.91% cases. In our study Intraocular pressure was clinically high in all patients at presentation (mean IOP 37.25mmHg) and it was absolutely normal after cataract surgery ( post-op mean IOP 18.07 mmHg). There was a clinically significant difference in IOP at presentation and IOP at last follow up. In study by R Ramkrishnan et al [9] pre -operative mean IOP was 38.4mmHg and post -operative mean IOP was 12.7mmHg.

To conclude the blindness due to lens induced glaucoma is avoidable and curable by timely intervention but there is need to increase the awareness of this condition in general population to decrease the burden of the blindness.

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