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A Study of Visual Outcome in Lens Induced Glaucoma

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Abstract
Background: *Lens induced glaucomas are a common occurrence in rural areas of India.*
Objective: *The purpose of this study was to determine the pattern and visual outcome in LIG cases*
Methods: *This cross sectional study was based on the patients with LIG, who attended the Ophthalmic OPD, Government general hospital, Kakinada. All the patients underwent a complete ophthalmic examination, which included both anterior and posterior segment evaluation*
Results: *A total of 50 patients with a diagnosis of LIG were analyzed. Out of these 31(62%) patients had phacomorphic and 19(38%) had phacolytic glaucoma respectively. All the patients underwent surgery or a combined surgery. Postoperative BCVA upto 6/12 was achieved in 40(80%) and upto 6/60 in 45(90%) patients. Only 5 patients showed poor visual outcome. However, all the patients maintained postoperative IOP of < 20mm Hg without any additional antiglaucoma therapy.*
Conclusion: *Early diagnosis and treatment of mature cataract is very important since delayed treatment of lens-induced glaucoma may result in poor visual outcome.*
Key Words: *Lens Induced Glaucoma, Intraocular Pressure, Cataract*

I. Introduction

Glaucomas are a diverse group of eye conditions sharing the common features of progressive optic neuropathy(open angle) or occludable drainage angles in the anterior chamber(closed angle). Glaucoma is the second leading cause of blindness world wide. The uptake of eye care services by the rural community has been optimal in countries like India where lens induced glaucomas are a common cause of ocular morbidity (1).Lens induced glaucoma compromise a number of different glaucomatous processes occurring in the elderly that share in common the role of the crystalline lens in the mechanism of increase in IOP (2). LIG in general may be secondary angle closure (phacomorphic) or secondary open angle (phacolytic) (3). Other types like lens particle glaucoma and phacotoxic glaucoma may occur in some cases. In the present era many ophthalmologists have worked with latest surgical techniques (4), but the modality of treatment in such type of glaucoma is lens extraction. Mode of treatment is Small incision cataract surgery with PC IOL, or extracapsular cataract extraction with posterior chamber IOL implantation (ECCE with PC IOL) with or without iridectomy (5,6). However, postoperative recovery in these conditions remains guarded. In order to evaluate this information the present study was attempted to study the pattern and visual outcome of the current management of LIG.

II. Materials And Methods

All the patients who attended the Outpatient Department of Ophthalmology at Government general hospital , Kakinada between 2013 to 2015 with a diagnosis of lens induced glaucoma for a period of two years were included in the study.50 cases of lens induced glaucoma with senile cataract and IOP > 30 mm Hg were analyzed. Patients with a history of primary open angle or narrow angle glaucoma, trauma and patients with LIG with prior ocular hypotensive management elsewhere were excluded.

A complete history related to the illness was taken with duration of decrease in vision, mode of onset, redness, watering, pain or any other associated symptoms. The duration between symptoms and surgery was also noted. The patients were subjected set protocol of investigations which included: visual acuity, anterior segment examination, tonometry,fundus examination and gonioscopy of both the eyes. The anterior chamber depth was assessed by directing the slit beam adjacent to the limbus. The AC was considered shallow if the depth was less than 1/4th of the corneal thickness.

Phacomorphic glaucoma was recognized by the subjective complaints of pain, redness with the presence of corneal edema, shallow anterior chamber, fixed dilated pupil and an intumescent cataractous lens. Phacolytic glaucoma was diagnosed by the presence of pain, corneal edema, normal or deep anterior chamber, flare, cells, with minimal KPs, the presence of mature or hypermature cataract with or without white spots on the anterior capsule.

Initially, control of IOP was done with tab. acetazolamide 250 mg oral four times a day, topical timolol maleate 0.5% 12 hourly and intravenous mannitol. Topical dexamethasone 0.1% eye drops 4 times a day was given to reduce inflammation. After obtaining a written informed consent and explanation of relatively guarded prognosis, all the patients were subjected to cataract extraction with PC IOL implantation. ECCE +PC IOL was done for phacomorphic glaucoma cases. ECCE+ PC IOL with iridectomy has done for phacolytic glaucoma cases. Post operative stay varied from 2 to 5 days. During post operative period, artibiotic steroid drops, cycloplegics, systemic antibiotic and antiinflammatory drugs were used. All the operated cases were examined postoperatively daily and discharged on 3rd postoperative day. The patients were followed up in OPD for a period of 6 weeks. All the patients were put on topical Gatifloxacin and Dexamethasone six times a day during post operative period. A short acting cycloplegic was also added. On the follow up, visual acuity, anterior segment examination,tonometry and fundus examination was done. A good IOP control was defined as a final postoperative IOP of < 21mm Hg, without the need for any antiglaucoma medication. Poor visual outcome at postoperative six weeks was defined as best corrected visual acuity of less than 6/60.

III. Observation & Results

A total 50 patients with LIG were analyzed. In our series 11(22%) patients were less than 50 years, 39(78%) patients were in the age group of 51-70 years . Maximum no.of patients were in the sixth decade of life (Table.1). Females were more in the current study (Table.2). The most common symptoms were ocular pain,defective vision and redness of eyes. duration of pain of 1-5 days was seen in 22(44%) cases,6-10 days in 21(42%)cases, 11-15days in 4(8%) cases, and more than 15days in 3(6%) cases. Maximum duration of ocular pain reported was 18 days.(Table.3) The visual acuity at the time of admission was hand movement close to face or less. But none of the patient had faulty light projection.

Circumciliary congestion, corneal edema and cataractous lens were present in all the cases. In the present study the highest IOP recorded was 59.1mm Hg, the lowest was 33 mm Hg and the mean was 42.5 mm Hg. In 96% of cases the intraocular pressure was more than 30mm Hg(Table.4). Examination of the fellow eye revealed normal anterior chamber depth and open angle in all the patients. IOP was less than 20 mm Hg in all the fellow eyes. Of these 31(62%) patients had phaco- morphic glaucoma and 19(38%) patients had phacolytic glaucoma (Table.5). With a mean follow-up of 6 weeks we found that all the patients maintained a normal postoperative pressure of less than 20 mm Hg without any additional medical therapy. BCVA of 6/12 could be obtained in 40 (80%) patients. 45(90%) patients achieved BCVA upto 6/60. 5(10%) patients showed poor visual recovery ie.<6/60 (Table.7).

Table -1 AGE INCIDENCE

Age	No.of cases	Percentage
20-40	1	2%
40-50	10	20%
>50	39	78%

Maximum patients of lens induced glaucoma were in the age group of above 50 years (78%)

Table -2 SEX INCIDENCE

Sex	No.of cases	Percentage
Male	17	34%
Female	33	66%

Lens induced glaucomas were more common in females M:F = 1:1.94

Table -3 DURATION OF SYMPTOMS

Duration (in days)	No. of cases	Percentage
1-5	22	44%
5-10	21	42%
10-15	4	8%
>15	3	6%

About 86% of cases attended with 10 days.

Table – 4 RANGE OF IOP

Range of IOP	No. of cases	Percentage
20-25	0	0
25-30	2	4%
30-40	13	26%
>40	35	70%

In 96% of cases the intraocular pressure was more than 30mm Hg

Table -5 TYPE OF LIG

Type of LIG	No. of cases	Percentage
Phacomorphic glaucoma	31	62%
Phacolytic glaucoma	19	38%

Phacomorphic glaucoma cases are more 62% in lens induced glaucomas.

Table -6 NATURE OF SURGERY

Nature of surgery	No. of cases	Percentage
Combine Surgery	10	20%
SICS with PCIOL	22	44%
SICS PCIOL + iridectomy	3	6%
ECCE with PCIOL	9	18%
ECCE PCIOL+ iridectomy	4	8%
Cyclocryotherapy	2	4%

Table -7 VISION AFTER TREATMENT

Post op visual acuity	No. of Cases	Percentage
6/60 (or) Less than 6/60	5	10%
6/60 - 6/24	4	8%
6/24 – 6/18	1	2%
6/12-6/6	40	80%

More than 80% of cases regained fair visual acuity

IV. Discussion

Lens induced glaucomas are a common occurrence in India (7).Though phacomorphic and phacolytic glaucomas are clinically distinct entities, they have certain common factors in that they are lens induced, they compromise the function of the optic nerve due to rise of intraocular pressure, cataract surgery is curative in these cases, and finally they uniformly share a guarded prognosis (8).

We have observed that 90% of our cases above the age of 50 years had the maximum incidence of cataracts (Table No.l) The onset of senile cataract is earlier in Indian patients. Late reporting for treatment of cataract leads to serious complications like LIG.LIG remains one of the most important cause of irreversible loss of vision, especially so in the rural population. Data collected from Flocks *et al*, Ali Abdollahi *et al*, Rohatgi JN also reveals LIG to be a disease of increasing age(11,12,13).

The incidence of LIG in females was more common than males in our study, in a ratio of 2:1(Table.2). The reason could be lesser attention received by old women in rural India, and also females having shallow anterior chamber, thus making them more prone to angle closure. Analysis shows females are affected more as compared to males. This is identical with the studies of Sinha A and Prajan et al (14,15).

These patients had painless progressive loss of vision initially of variable duration, similar to cases of senile cataract, But reported late when there is sudden onset of pain, redness, headache, watering. In our study 86% of patients attended the hospital within 10 days (Table.3).

In our study 76% of cases have IOP more than 30mmHg. We observed that the height of intraocular pressure has no relationship with the duration of attack, and type of cataract. In all these cases IOP decreased with medical management.(Table.4) Analyzing anterior chamber and gonioscopic findings in the fellow eyes, our study found normal AC depth and open angle in all the cases. This is similar to earlier study done by Das JC (16).

The present study demonstrates that phacomorphic glaucoma (62%) is more common than phacolytic glaucoma(38%)(Table.5). . Rijal AP et al, Sharma RG et al have too documented phacomorphic glaucoma to be common than other forms of LIG (9,10). In our study of Lens induced glaucoma cases, phacomorphic glaucoma cases (62%) are more common. This may, be due to high incidence of cortical cataracts in Indian Population. Cataract extraction remains the only definitive treatment for an intumescent cataract.Cataract surgery in phacomorphic glaucoma poses several challenges.

Of the 31 cases of phacomorphic glaucoma, Combined surgery was done for twelve (12) cases, with longer duration of attack, where angle of the anterior chamber was closed by peripheral anterior synechiae (PAS). ECCE with PC IOL with Iridectomy was, done, in two cases , where PAS is seen, less than 180°. ECCE with PC IOL was done, for the remaining cases with short duration of attack, where PAS was not seen. (Table.6).

In six out of the 19 cases of phacolytic glaucoma , ECCE PC IOL with iridectomy was done. Posterior capsule rupture and vitreous disturbance occured in two cases of phacolytic glaucoma, Where vitrectomy was done with no IOL implantation.Two cases of atrophic bulbi with IOP of 4m Hg attended, where only symptomatic treatment was given. ECCE with trabeculectomy was done, in 2 cases of phacolytic glaucoma, with one month duration of attack with hypermature cataract. Cyclocryo therapy was done in 2 cases of Phacolytic glaucoma with corneal decompensation and No Perception of light.

In our study, few cases have developed striate Keratopathy, in the early post operative period which subsided later. 8% of cases have developed glaucomatous optic atrophy. 4% of the cases have developed atrophic bulbi, due to delay in attending the hospital.

Visual acuity, intra ocular pressure and fundus were choosen as the parameters for followup. In our study at six weeks BCVA of 6/12 was achieved in 40 cases (80%), 6/18-6/60 in 5 (10%) and < 6/60 in 5 cases (12%). In our study BCVA upto 6/60 was achieved in 45 cases (n=50).which is more or less similar to Prajan NV et al study that showed BCVA of >6/60 in 82cases (88%) and less than 6/60 in 5cases (10%).(Table.7).The poor postoperative visual acuity (<6/60) was seen in five patients (out of 50) with optic atrophy to be the common cause. Prajan NV *et al* and Rijal AP have too documented optic atrophy as the common cause of poor visual outcome(15,9). The final visual acuity was related more to the duration of attack than to the type of surgery. Visual prognosis is poor, if there is a delay in seeking treatment. Glaucoma secondary to hyper mature cataract can be saved by prompt removal of the cataract. Earlier is the lens extraction, better is the visual and IOP outcome. There is a great need to impart health education to the public about the importance of timely surgery for better visual outcome .

In our prospective study on 50 patients of LIG with a mean follow-up of 6 weeks we found that all the patients maintained a normal postoperative pressure of less than 20 mm Hg without any additional medical therapy which correlates well with Venkatesh R *et al* and Singh G studies who too achieved IOP < 20 mm Hg in all their patients at the end of follow-up period without any antiglaucoma medication (18,19).

V. Conclusion

Early diagnosis and treatment of mature cataract is very important since delayed treatment of lens-induced glaucoma may result in poor visual outcome. Despite high IOP at the initial presentation in cases of lens induced glaucoma, IOP came down to normal limits after lens extraction. The results of LIG in response to visual recovery and IOP control is quite satisfactory and encouraging.

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