

Clinical Study of Visual Prognosis in Lens Induced Glaucoma

V Sree Kumar¹, E. Satya Narayana Murthy², B. Preethi³

ABSTRACT

Introduction: Lens Induced Glaucoma (LIG) is a clinical condition characterized by secondary glaucoma in one eye with senile mature cataract, hyper mature senile cataract (rarely immature senile cataract) yet with an open angle). The present study was conducted to assess the visual outcome following medical and surgical management of lens induced glaucoma and to study the intraocular pressure control pre and post-operatively.

Material and methods: A prospective, nonrandomized study of Patients with lens induced glaucoma (LIG) visiting Regional eye hospital, Warangal outpatient and inpatient departments was undertaken from 2015 to 2016. Standardized ophthalmic evaluation was performed at presentation, on 1st post-operative day and at weeks 1,2,4 and 6 following cataract surgery. Main outcome measures include changes in intraocular pressure and BCVA.

Results: Hundred patients (men, 26 [26%]; women, 74 [74%]) were included and all completed the 12-week follow-up period of the study. Most of the patients (91%) had BCVA better than 6/60 after surgery. Post-operative IOP reduced to normal in almost all cases.

Conclusion: Early presentation and moderate increase in preoperative IOP and early treatment resulted in good visual outcome.

Keyword: Cataract, Glaucoma, Secondary Glaucoma, Visual Acuity.

INTRODUCTION

Lens-induced-glaucoma is a distinct pathological entity, clinically recognizable, easily preventable and often curable by cataract extraction.¹ Lens induced glaucoma due to hyper mature cataracts are an important cause of secondary glaucoma and a common cause of ocular morbidity in developing world. Cataract in India is the most important cause of preventable blindness accounting to 63.7 percent.² The majority of people in our country are poor, uneducated and living in rural areas and they are unaware of the complications of leaving a cataract untreated which finally results in secondary glaucoma, in which lens itself is the causative factor. The lens has to continuously grow, in order to maintain its morphological ratio with the other structures in the eye. It cannot make any way posteriorly because of the presence of vitreous and its increase in size is accommodated only by the aqueous humour resulting in alteration in anterior chamber and posterior chamber. In addition the lens unlike other ectodermal structures is devoid of the ability to get rid of its old fibres which are buried in itself in the centre forming the hard core. This imposes unlimited restrictions in its rate of growth. With aging, the lens assumes greater thickness, a

greater curve of its anterior surface, and the zonules loosen.³⁻⁶ These factors cause increasing shallowness of the anterior chamber and iridolenticular contact,⁷ which results in a greater amount of pupillary block. Lens induced glaucoma in general may be secondary angle closure (phacomorphic) or secondary open angle (phacolytic).⁸ This study was done with the main aim that lens is the chief incriminating factor in the production of secondary glaucoma and removal of the causative factor, that is, the lens by surgical method relieves glaucoma. The study assessed the visual outcome and intraocular pressure control.

MATERIAL AND METHODS

A study of lens induced glaucoma was done for a period of 12 months in regional eye hospital, Warangal from 2015 to 2016. The study was approved by the institutional ethical board. All the subjects were informed about the study and a written consent was obtained from all. This non randomized prospective study included all the subjects with lens induced glaucoma irrespective of age and gender. All the subjects were included irrespective of onset and duration of symptoms. Patients with glaucoma due to trauma or any other ocular disease were not included in the study. Before the initiation of treatment, systemic evaluation of all the subjects was done. Cataract extraction is the definitive treatment for phacolytic glaucoma.³ Before surgery, IOP and inflammation was reduced by medical treatment, including hyperosmotic agents, topical adrenergic agents, CAIs, cycloplegic drugs, and topical corticosteroids. SICS with posterior chamber IOL was performed as a the definitive treatment. Anterior chamber thoroughly irrigated to remove some of the macrophages and lens material to avoid postoperative IOP rise. Follow up of the subjects was performed on 1st postoperative day, 1st, 2nd, 4th and 6th postoperative week. Visual acuity and tonometric examination of all the subjects were performed. Anterior segment evaluation was done with slit lamp biomicroscopy.

STATISTICAL ANALYSIS

All the data was arranged in a tabulated form and analyzed descriptively using SPSS software.

¹Assistant Professor, ²Assistant Professor, ³Post Graduate, Department of Ophthalmology, Regional Eye Hospital, Warangal, India

Corresponding author: Dr V. Sree Kumar, Assistant Professor, Regional Eye Hospital, Warangal, Telangana State, India.

How to cite this article: V Sree Kumar, E. Satya Narayana Murthy, B. Preethi. Clinical study of visual prognosis in lens induced glaucoma. International Journal of Contemporary Medical Research 2018;5(3):C6-C8.

Visual acuity	<5 days	6-10 days	11-15 days	>15 days
Better than 6/12	28	5	0	0
Between 6/18 to 6/60	12	42	3	1
Less than 6/60	0	3	4	2

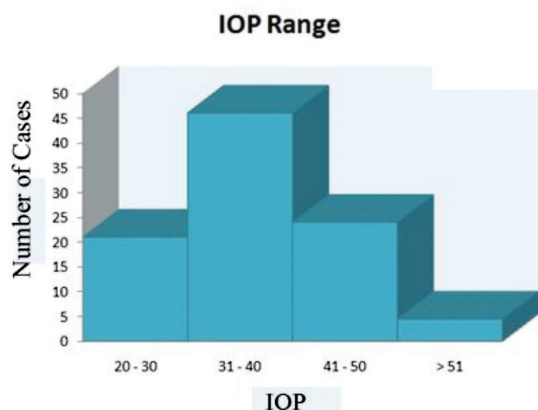
Table-1: Relationship between duration of symptoms and postoperative BCVA

Intraocular pressure	>6/12	6/18-6/60	<6/60
20-40 mm Hg	30	27	0
41-50 mmHg	3	20	2
>51mmHg	0	11	7

Table-2: Comparison between preoperative intraocular pressure and postoperative BCVA

BCVA	No. of cases
<6/60	9
6/60-6/36	8
6/24-6/18	50
6/12-6/6	33

Table-3: Vision after surgery



Graph-1: Intraocular pressure at the time of admission.

RESULTS

Amongst 100 cases of lens induced glaucoma, 50% subjects are between 61-70 years, 20% were above 70 years, 19% were between 51-60 years, 9% were between 41-50 years and 2% were less than 40 years. There were 74% females and 26% males.

Graph 1 illustrates the intraocular pressure at the time of admission, in 46 percent cases found to be 31-40 mmhg, in 24 percent cases it is 41-50 mmhg, 21 percent cases had 20-30 mmhg and in 9 percent cases it was found to be more than 51.

Table 1 illustrates the relationship between duration of symptoms and postoperative BCVA. When the duration of symptoms was less than 5 days, 28 subjects had visual acuity better than 6/12 and 12 subjects had visual acuity between 6/18 to 6/60. When the duration of symptoms was between 6-10 days, only 5 subjects had visual acuity better than 6/12, 42 subjects had visual acuity between 6/18 to 6/60 and 3 had visual acuity less than 6/60. When the duration of symptoms was between 11-15 days, 3 subjects had visual acuity

between 6/18 to 6/60 and 4 had visual acuity less than 6/60. When the duration of symptoms was more than 15 days, 1 subject had visual acuity between 6/18 to 6/60 and 2 had visual acuity less than 6/60

Table 2 shows the comparison between preoperative intraocular pressure and postoperative BCVA. When the intraocular pressure was 20-40 mmHg, there were 30 subjects with visual acuity more than 6/12, 27 subjects with visual acuity between 6/18- 6/60. Intraocular pressure was 41-50 mmHg amongst 3 subjects with visual acuity more than 6/12, 20 subjects with visual acuity between 6/18-6/60 and 2 subjects with visual acuity less than 6/60. Intraocular pressure was more than 51mmHg amongst 11 subjects with visual acuity between 6/18-6/60 and 7 subjects with visual acuity less than 6/60.

Table 3 demonstrates the vision after surgery. There were 9 subjects with visual acuity less than 6/60. There were 8 subjects with visual acuity between 6/60-6/36. There were 50 subjects with visual acuity between 6/24-6/18. There were 33 subjects with visual acuity between 6/12-6/6.

DISCUSSION

Lens induced glaucomas are commonly seen in India.⁹ Although phacomorphic and phacolytic glaucomas are clinically different pathologies, they still have few mutual factors that they are induced by lens and they compromise the optic nerve function due to increased intraocular pressure. Surgery for cataract is useful in these cases and has a good prognosis.¹⁰ According to Dr. Damodhar Pradan et al., Nepal 35% cases occurring in patients aged under 60years.¹¹ In our study, it was observed that 70% cases are above 60 years and 30% are under 60 years. The incidence of LIG in females was more common than males in our study. This was similar to the studies conducted by Sinha A and Prajan et al.^{12,13} According to Dr.S.K. Agra et.al¹⁴ it was F:M ratio 3:1 and according to Dr. Damodhar Pradhan et.al, it was 1.7:1. In our study, more than 80% of cases regained fair visual acuity. The final visual acuity was related more to the duration of attack than to the type of surgery. Visual prognosis is poor, if they delay seeking treatment. According to our study, when the intraocular pressure was 20-40 mmHg, there were 30 subjects with visual acuity more than 6/12, 27 subjects with visual acuity between 6/18- 6/60. Intraocular pressure was 41-50 mmHg amongst 3 subjects with visual acuity more than 6/12, 20 subjects with visual acuity between 6/18-6/60 and 2 subjects with visual acuity less than 6/60. Intraocular pressure was more than 51mmHg amongst 11 subjects with visual acuity between 6/18-6/60 and 7 subjects with visual acuity less than 6/60.

The absolute treatment for lens induced glaucoma is extraction of cataract.^{15,16} The outcome after surgery in these cases is chiefly related to the duration between the symptom onset and the treatment¹⁷ and the presence of factors like optic atrophy, uveitis and corneal edema.¹⁶ According to our study, when the duration of symptoms was less than 5 days, 28 subjects had visual acuity better than 6/12 and 12 subjects had visual acuity between 6/18 to 6/60. When the duration

of symptoms was between 6-10 days, only 5 subjects had visual acuity better than 6/12, 42 subjects had visual acuity between 6/18 to 6/60 and 3 had visual acuity less than 6/60. When the duration of symptoms was between 11-15 days, 3 subjects had visual acuity between 6/18 to 6/60 and 4 had visual acuity less than 6/60. When the duration of symptoms was more than 15 days, 1 subject had visual acuity between 6/18 to 6/60 and 2 had visual acuity less than 6/60. It is very important to understand the presentation, etiology and management of lens induced glaucoma are crucial for prevention of blindness.

CONCLUSION

Early presentation and moderate increase in preoperative IOP and early treatment resulted in good visual outcome. Despite high IOP at the initial presentation in cases of lens induced glaucoma, IOP came down to normal limits after lens extraction.

REFERENCES

1. Lowe R. Causes of shallow anterior chamber in primary angle-closure glaucoma. *Am J Ophthalmol.* 1969;67:87-93.
2. Lowe R. Anterior lens displacement with age. *Br J Ophthalmol.* 1970;54:117-121.
3. Chandler PA: Problems in the diagnosis and treatment of lens-induced uveitis and glaucoma, *Arch Ophthalmol* 60:828, 1958.
4. Markowitz S, Morin D. Angle-closure glaucoma: relation between lens thickness, anterior chamber depth and age. *Can J Ophthalmol.* 1984;19:300-302.
5. Lowe R. Aetiology of the anatomical basis for primary angle-closure glaucoma. *Br J Ophthalmol.* 1970;54:161-169.
6. Markowitz S, Morin D. Angle-closure glaucoma: relation between lens thickness, anterior chamber depth and age. *Can J Ophthalmol.* 1984;19:300-302.
7. Fontana S, Brubaker R. Volume and depth of the anterior chamber in the normal aging human eye. *Arch Ophthalmol.* 1980;98:1803-1808.
8. Sihota R, Tandon R. *The Glaucoma in: Parsons diseases of the eye* 19th edition. Butterworth Heine mann 2003. pp. 277-80
9. Jain IS, Gupta A. Phacomorphic glaucoma-management and visual prognosis. *Ind J Ophthalmol* 1983; 31:648-53.
10. Richter CU. Lens induced Open angle Glaucoma in: *The Glaucomas.* Rich R, Shields B, Krupin T. *The Glaucomas*, Vol. 2, 2nd edition, Mosby 1996.pp.1023-30
11. Diagnosis and Management of LIG Epstein DI *Ophthalmology* 1982;89: 227-30.
12. Rohatgi JN. Lens induced glaucoma. A clinical study. *Ind J Ophthalmol* 1972;20: 88-93
13. Sinha A. Combined trabeculectomy and cataract extraction. *Ind J Ophthalmol* 1983; 31:836-38.
14. Treatment of phacolytic glaucoma with ECCE Lane SS, Kopietz LA, Lindquist TD, Leavenworth N *Ophthalmology*, 1988;95:749-53.
15. Prajna NV, Ramakrishnan R, Krishnadas R, Manoharan

N. Lens-induced glaucomas-visual results and risk factors for final visual acuity. *Indian J Ophthalmol* 1996;44: 149-55.

16. Rijal AP, Karki DB. Visual outcome and IOP control after cataract surgery in lens induced glaucomas. *Kath Univ Med J* 2006;4:30-3.
17. Rohatgi JN. Lens induced glaucoma. A clinical study. *Indian J Ophthalmol* 1972; 20: 88-93.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 10-02-2018; **Accepted:** 15-03-2018; **Published:** 25-03-2018