

Clinical profile of lens induced glaucoma patients in a tertiary care centre- A prospective study

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Abstract

Introduction: Lens Induced Glaucoma (LIG) is one of commonest cause of secondary glaucoma due to senile cataracts. The purpose of this study was to assess the outcome of LIG following cataract surgery.

Objective: To determine the frequency, types, the clinical presentations, management and outcome of lens-induced glaucoma (LIG).

Materials and Methods: It was a prospective observational study which was done at Calcutta National Medical College, Kolkata, from July 2012 to June 2013. Patients who attended out-patient department (OPD) of this hospital with LIG were admitted for conservative management followed by cataract surgery. Demographic data, clinical presentations, management and outcome were recorded and analysed.

Results: The age of presentation of LIG was varied ranging from 31 years to 85 years. The study had female preponderance (53.7%). The major type of LIG was phacolytic glaucoma (53.8%). All the patients had pain and watering in the eyes and decreased vision during admission. Most patients (31 eyes) were presented with visual acuity of hand movements (57.4%) and intraocular pressure more than 40 mm Hg (61.1%). Most of the patients (75.9%) underwent manual small incision cataract surgery (M-SICS) with posterior chamber lens (PCIOL) implantation. Reduced Intraocular pressure (IOP) after complete follow up was 15.2 mm Hg and most of the patients (75.9%) had their post-operative best corrected visual acuity more than 6/36 after completed follow up.

Conclusion: Cataract surgery was the most important effective mode of lowering IOP and visual recovery in patients with lens induced glaucoma. Public awareness and early detection by house physician is important for an early intervention which aids IOP control and visual recovery in LIG.

Keywords: Lens-induced glaucoma, Phacomorphic glaucoma, Phacolytic glaucoma.

Introduction

Glaucoma is a chronic progressive optic neuropathy characterized by retinal ganglion cell death and associated visual field loss.¹ Twenty million blind people reside in India out of which eighty percent have preventable blindness. Cataract in India, is the most common cause of preventable blindness accounting to 62.6%.² Lens-induced glaucoma (LIG) was first described in the year 1900 by Gifford³ and von Reuss⁴ independent of each other. Gifford described it as a glaucoma associated with hypermature cataract and von Reuss described it as a glaucoma associated with spontaneous absorption of lens substance through intact lens capsule. Subsequently, various workers⁵⁻⁷ described such types of cases under different names like LIG, lens-induced uveitis and glaucoma, phacotoxic glaucoma, phacogenic glaucoma, and finally phacolytic glaucoma. LIG is a clinical condition characterised by (i) a violent secondary glaucoma mimicking acute angle closure glaucoma in one eye with senile mature cataract, hyper mature senile cataract with an open angle and rarely intumescent stage of cataract, (ii) normal intraocular pressure and open angle in other eye, and (iii) a prompt relief of symptoms and restoration of vision after cataract extraction in the affected eye. Delayed presentation for treatment of cataract leading to serious complications like LIG

remains one of the most important cause of irreversible loss of vision, especially in the rural population. This preventable and curable condition, though very rare in developed countries, is still prevalent in India.

Materials and Methods

The study was conducted in Ophthalmology ward of Calcutta National Medical College & Hospital, Kolkata, during the period from July 2012 to June 2013. Fifty-four cases were selected who were admitted. Detailed history, thorough clinical examination, investigations, management and follow up were done and recorded.

Clinical examination included best corrected visual acuity (BCVA), Slit lamp examination, Goldman's applanation tonometry, Goldman's two mirror gonioscopy and direct / indirect (where possible) were done.

The investigations done were blood for haemoglobin, total leukocyte count, differential leukocyte count, Erythrocyte sedimentation rate, fasting and post prandial blood sugar, X-ray – antero-posterior and lateral view of orbit in case of trauma and ultrasonography B scan.

The patients were treated medically to reduce the IOP and inflammation and then underwent cataract surgery. The various types of surgeries performed were

manual small incision cataract surgery (M-SICS) with posterior chamber intraocular lens (PCIOL), Extracapsular cataract extraction (ECCE) with PCIOL, intracapsular cataract extraction (ICCE) with peripheral buttonhole iridectomy (PBI) and ICCE with anterior vitrectomy with PBI. IOP measurement was done in every case before and after medical and surgical management. Best corrected visual acuity measurement was also done before and after 1st and 6th week of cataract surgery.

Statistical Analysis: Data was collected and entered in Microsoft Excel then into statistical database SPSS (statistical package for social sciences, version 20.0, windows compatible). Data analysed using standard statistical technique like tabulation, proportions, percentage, mean and standard deviation. A probability value ('p' value) of < 0.05 was considered as statistically significant.

Results

Total number of 1174 patients with different ocular diseases were admitted in the department of Ophthalmology during the study period. The incidence of LIG patients was 4.6%. All the patients were unilaterally affected either right (24) or left eye (30). The average age at presentation for phacolytic glaucoma was 59 ± 10 years, for phacomprphic glaucoma, 55 ± 8 years. Most of the patients were between 51 and 60 years age group. Maximum number of patients (53.7%) was phacolytic glaucoma (Table 1). The study had female preponderance (53.7%). In clinical presentation point of view, all the patients

presented with pain and watering of eyes, photophobia and decreased visual acuity but few patients had vomiting (16.7%). All the cases had ciliary congestion and semidilated pupil. Most of the patients (94.4%) had corneal oedema and lens was cataractous (96.3%) (Table 2). Visual acuity (VA) was categorised as <6/60 and $\geq 6/60$. Best corrected visual acuity (BCVA) changes after cataract surgery was statistically significant ($P < 0.00001$) (Table 3). It was found that 7 cases of phacolytic and 2 cases of phacomorphic glaucoma had defective projection of rays. The IOP was reduced to normal level (< 21mmHg) after best possible medical management was 14 (25.9%) of patients. IOP was reduced dramatically in normal level (<21mmHg) in all patients in immediate post-operative period and the average IOP after complete follow up was $15.275 \text{ mmHg} \pm 0.506$ and IOP changes was statistically significant ($P < 0.0016$) (Table 4). 72.2% patients recovered their visual acuity more than 6/36 after cataract extraction with PCIOL implantation and IOP reduction.

Table 1: Distribution of Lens induced glaucoma patients

Types of LIG	Number of Patients	N (%)
Phacomorphic glaucoma	16	29.6
Phacolytic glaucoma	29	53.7
Dislocated lens induced glaucoma	8	14.8
Lens particle glaucoma	1	01.9
Total	54	100

Table 2: Distribution of clinical signs of LIG patients

Types of LIG	No of patients	clinical signs on slit lamp examination									
		Ciliary congestion	Cornea		Anterior chamber		Iris pattern		Pupil semi-dilated	Lens	
			Clear	Cloudy	Shallow	Deep	Normal	Atrophic		cataractous	clear
Phacomorphic	16	16	0	16	16	0	13	3	16	16	0
Phacolytic	29	29	0	29	0	29	27	2	29	29	0
Dislocated lens	8	8	3	5	5	3	6	2	8	6	2
Lens particle	1	1	0	1	0	1	1	0	1	1	0
Total	54 (100%)	54 (100%)	3 (5.6%)	51 (94.4%)	21 (38.9%)	33 (61.1%)	47 (87%)	7 (13%)	54 (100%)	52 (96.3%)	2 (3.5%)

Table 3: Best corrected visual acuity before and after cataract surgery

Types of LIG	Before Surgery		After Surgery	
	VA < 6/60	VA $\geq 6/60$	VA < 6/60	VA $\geq 6/60$
Phacomorphic glaucoma	16	0	1	15
Phacolytic glaucoma	29	0	4	25
Dislocated lens induced glaucoma	7	1	2	6
Lens particle glaucoma	0	1	0	1
Total	52 (96.3%)	2 (03.7%)	7 (13.0%)	47 (87.0%)

Table 4: Pre and post-operative IOP of different types of LIG

Types of LIG	No of patients	Mean IOP at Presentation (mmHg)	Mean IOP after post-operative complete follow up (mmHg)	P value
Phacolytic glaucoma	29	47.6	15.7	< 0.0016
Phacomorphic glaucoma	16	48.3	15.7	
Dislocated lens induced glaucoma	8	33.7	14.7	
Lens particle glaucoma	1	31	15	
Mean (SD)	54	40.150 = 9.078	15.275 ± 0.506	

**Fig. 1: Phacomorphic glaucoma****Fig. 2: Phacolytic glaucoma**

Discussion

Cataract, though curable remains the most important cause of blindness in developing countries, affecting mostly the older people. Delayed presentation for treatment ends up in serious complications like lens-induced glaucoma causing irreversible sight loss. In spite of easy availability of surgical facilities with constant efforts of the National Programme for Control of Blindness (NPCB), NGOs, government agencies and private practitioners and also availability of a very cost effective rewarding cataract surgery still, many people are becoming blind due to lack of awareness about importance of early management. Illiterate, older, and rural population are the worst affected.

In this study, majority of the cases belong to phacolytic glaucoma (53.7%). This study showed females outnumbered males in both phacomorphic and phacolytic glaucoma. Angra et al (1991), Prajna et al (1996) and Braganza et al (1998) had similar observation.⁸⁻⁹ The present study revealed most of the patients of LIG were between 51 and 60 years age group. Some studies showed similar observations.⁸⁻¹⁴

All the patients in this study presented with pain, watering, photophobia and decreased visual acuity but few patients had vomiting. Very rare variations in presentation were observed by Ramamurthy et al, Verma et al, Epstein et al, Angra et al and Prajna et al, Rohtagi et al in their studies.^{8,9,13}

It was found that 7 cases of phacolytic and 2 cases of phacomorphic glaucoma had defective projection of rays. Similar observation was found in studies done by Gupta, Ramamurthy and Angra et al.⁸ It was found that in phacomorphic glaucoma patients had invariably shallow anterior chamber due to pushing forward of iris by the swollen lens. This type of finding was consistent with other studies done by Angra et al, Prajna et al and Ditallevi.^{8,9,15}

All the cases had ciliary congestion, but diffuse corneal oedema was found in all the cases of phacomorphic and phacolytic glaucoma only. Similar pictures were observed in the studies done by Prajna et al, Braganza et al, Lane S.S. et al and W.H. Jarret.^{9-11,14}

In this study, the IOP was reduced to normal level (< 21mmHg) after best possible medical management was 14 (25.9%) of patients.

72.2% patients recovered their best corrected visual acuity more than 6/36 after cataract extraction with PCIOL implantation and IOP reduction. Angra et al, Prajna et al and Lane S.S. et al studies showed, most of the patients (75.9%) had their post-operative best corrected visual acuity more than 6/36 after complete follow up.^{8,9,11} The most important cause of poor postoperative vision has been attributed to surgical complications.¹⁶

The presenting best corrected visual acuity was less than 6/60 in 96.3% of patients. This poor visual acuity inspite of easily available health care services in the hospital for cataract surgery, may be due to poor health education, acceptance of poor vision as part of aging, fear of operation, lesser expectations and socioeconomic constraints. In many cases, especially in rural areas, diagnosis may be wrong by the local practitioners initially. Another factor about late presentation was that the elderly patients were left uncared by their relatives and were delayed to be brought to the hospital. Murthy et al reported that most of the patients had presenting vision of less than 6/60.¹⁷

Conclusion

The aim of the present study was to evaluate the different factors affecting the crystalline lens leading to lens induced glaucoma and to find out the prognosis and visual outcome after medical and surgical management. The study had been carried out in 54 patients of lens induced glaucoma admitted to the eye ward of the Calcutta National Medical College and Hospital during the period of July 2012 to June 2013.

We conclude that due to large number of cataract cases in our country, cases of lens induced glaucoma are quite prevalent. Cataract extraction is the cure in all cases of phacomorphic and phacolytic glaucoma with negligible residual complications so far as the control of intra-ocular pressure and restoration of visual acuity is concerned. In case of lens particle glaucoma, no definite conclusion could be drawn as the present series included only one case. In majority of failed cases, patients presented late and optic atrophy had already set in.

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