



## LENS INDUCED GLAUCOMA, ITS INCIDENCE AND MODE OF PRESENTATION—A CLINICAL STUDY

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**ABSTRACT** **Aims :** 1) To find out the incidence of lens induced glaucoma (LIG). 2) To assess the various modes of presentation of lens induced glaucoma. **Materials and Methods:** A total of 51 cases of LIG were included in this study. A detailed history and thorough ocular examination including visual acuity, slit lamp examination, tonometry , gonioscopy, funduscopy and biomicroscopy were done. **Results and Observations:** Incidence of LIG was found to be 0.15%. Phacomorphic glaucoma was 58.86% followed by Phacolytic glaucoma 33.33%, lens particle glaucoma 5.82% and 3.92% of glaucoma secondary to lens dislocation. **Conclusion:** LIG is an important vision threatening complication of cataract, so early diagnosis and treatment of mature cataract is very important to reduce the incidence of LIG as well as delayed treatment of LIG may result in poor visual outcome.

**KEYWORDS :** LIG, Phacolytic glaucoma, Phacomorphic glaucoma , tonometry.

**INTRODUCTION:**

Glaucoma is a diverse group of eye diseases with multifactorial etiology, characterized by an acquired loss of retinal ganglion cells, progressive optic neuropathy with morphological abnormalities in the optic nerve head and visual field defects, in which raised intraocular pressure is a major and only modifiable risk factor.<sup>[1]</sup>

The estimated prevalence of glaucoma in the world was 60.5 million in 2010 and is expected to increase to 79.6 million in 2020.<sup>[2]</sup> Studies have shown that approximately 12 million Indians have already been affected by the disease by the year 2010 and with greater life expectancy and rapidly growing ageing population this figure has been estimated to increase to 16 million by 2020.<sup>[2]</sup>

Glaucoma is a life long disease and is a leading cause of irreversible but preventable blindness (5.80%) in Indian next only to cataract (62.60%)<sup>[3,4]</sup>

Lens induced glaucoma is a type of secondary glaucoma and is a ophthalmic emergency. The crystalline lens may be associated with glaucoma if dislocated either due to trauma or certain inherited disorders. A cataractous lens may lead to glaucoma by obstruction of trabecular meshwork with protein and macrophages (i.e. Lens particle glaucoma), lens particle and debris (i.e. Lens particle glaucoma) or inflammatory cells as a part of immune response to lens protein antigen (phacoanaphylactic glaucoma). A swollen or intumescent lens may lead to papillary block and secondary angle closure glaucoma (phacomorphic glaucoma).<sup>[5,6,7]</sup> Lens dislocation or subluxation can also lead to glaucoma.

There is cataract backlog of around 12 million in India.<sup>[8]</sup> This huge backlog of ever increasing cataract due to increased life expectancy, rapidly growing ageing population and disparity between rate of new cases and rate of surgical removal, the occurrence of LIG in India has high probability.<sup>[9]</sup>

**MATERIALS AND METHODS:**

The present study was conducted in tertiary care hospital for a period of one year. Altogether 51 patients presented with lens induced glaucoma were included in this study. Informed and written consent were taken from each of the patients.

**Inclusion criteria:** All patients that were diagnosed as LIG irrespective of age, sex and clinical types.

**Exclusion criteria:**

1. Cases of primary open angle glaucoma
2. Cases of lens induced glaucoma with previous posterior segment pathology

3. Corneal scarring or opacity which would hamper evaluation of visual outcome
4. Other causes of secondary glaucoma.

A detailed history and thorough clinical examination of both eyes including Visual acuity, Slit lamp examination, Tonometry, Gonioscopy and Funduscopy were done . A detailed examination of anterior segment of both eyes were done to find out the status of the lens which was swollen (intumescent), or whether there are any lens matter or pseudohypopyon in the anterior chamber, depth of the anterior chamber by slit lamp examination. Intraocular pressure was measured by using Goldmann applanation tonometry and bedside IOP using Schiottz tonometer. Gonioscopy was done using Sussman four mirror gonioscopes in the affected eye after the cornea clears sufficiently to allow visibility of angle structures. The grading system used were the Shaffer system and the R.P. centre system. Retinal function test and B-scan of affected eye was done as the fundus was not visible.

Aim of initial management was to bring down the raised IOP and relief from pain. Medical management included topical beta blockers (timolol maleate 0.5%), topical (dorzolamide) and oral (acetazolamide) carbonic anhydrase inhibitors, hyperosmotic agents (mannitol 20% and glycerol), mydriatics and topical steroid (prednisolone acetate 1% with dexamethasone). Oral analgesics (diclofenac) and I.V. Domperidone as antiemetics were used as supportive management. Nd:YAG laser iridotomy was done for failed medical management. Scleral tunnel sutureless cataract extraction was performed under peribulbar anaesthesia as surgical management.

**RESULT AND OBSERVATIONS:**

The incidence of lens induced glaucoma during current study was 0.15% with 31944 as total patient attending OPD. Among 31944 patients 51 cases of lens induced glaucoma were found.

**Table 1: Incidence**

Total number of cases attending the outpatient department at RIO	31944
Total number of Lens induced glaucoma	51
Incidence	0.159

**Table 2: Types Of Lens Induced Glaucoma**

Types of LIG	No. of patients	Percentage(%)
PHACOMORPHIC GLAUCOMA	29	56.86
PHACOLYTIC GLAUCOMA	17	33.33
LENS PARTICLE GLAUCOMA	03	5.88

SUBLUXATION/DISLOCATION/ PHACOTOPIC GLAUCOMA	02	3.92
PHACOANAPHYLACTIC GLAUCOMA	0	0

Out of 51 cases , 29 (56.86%) were diagnosed as Phacomorphic glaucoma followed by Phacolytic glaucoma 17 (33.33%).

Figure 1: Types Of Lens Induced Glaucoma

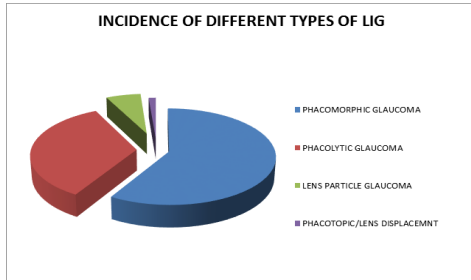


Table 3: Sex Distribution

Sex	Number of cases	Percentage(%)
Male	20	39.22%
Female	31	60.78%
Total	51	100%

p-value = 0.0418

This study revealed a higher incidence of Lens Induced Glaucoma in Females 31 (60.78 %) than Males 20 (39.22%).

Table 4: Age Distribution

Age in years	40-55	56-70	>71
Males	04	06	10
Females	05	18	08
Total	09	24	18
Percentage	17.64%	47.05%	35.29%

$\chi^2 = 4.514$ , p-value = 0.3856

In this series, maximum number of cases 24 (47.05%) was found in the age group 56-70.

Table 5: Presenting Complaints Of The Patients

SL No.	Symptoms	No. of patients	Percentage(%)
1	SWELLING OF LIDS	26	50.98
2	DIMINUTION OF VISIONS	51	100
3	EYE PAIN	51	100
4	REDNESS OF EYE	49	96.07
5	HEADACHE	45	88.23
6	VOMITING	8	15.68
7	WATERING	17	33.33

In our series, 100% of the cases presented with eye pain and diminution of vision followed by redness of the affected eye in 96% cases.

Table 6 : Presenting Signs Of The Patients

S No.	Signs	No of patients	Percentage(%)
1	CIRCUMCORNEAL CONGESTION	51	100
2	CORNEAL OEDEMA	51	100
3	AC REACTION	51	100
4	SHALLOW AC	29	56.86
5	MID DILATED PUPIL	51	100
6	FUNDUS VISIBLE	NONE	0
7	GONIOSCOPY CLOSED	29	56.86

On examination, circumcorneal congestion, diffuse corneal oedema and mid dilated and fixed pupil were present in all cases.

Table 7: Iop At Presentation

IOP (mm of Hg)	No. of patients	Percentage(%)
20-30	05	9.80
31-40	15	29.41
41-50	25	49.02
>50	06	11.76

Majority of cases (60.78%) have IOP more than 40 mm of Hg at presentation. 6 of them (11.76%) had IOP more than 50 mm of Hg.

Table 8: Presenting Iop In Different Types Of Lig

Types	20-30 (mm of Hg)	31-40 (mm of Hg)	>40 (mm of Hg)
Phacomorphic	3	6	20
Phacolytic	1	6	10
Lens particle	1	1	1
Dislocated lens	0	0	2

In this study, majority of patients developing phacomorphic and phacolytic glaucoma had IOP more than 40 mm of Hg at presentation.

## DISCUSSION

The present study was conducted on 51 cases of lens induced glaucoma for a period of one year in a tertiary care hospital.

Statistically Chi-Square ( $\chi^2$ ) and Probability values (p) were used and p-value <0.05 was considered statistically significant.

The incidence of LIG in this study was marginally less but comparable to the observation by Saikia A.K.<sup>[10]</sup> in a study conducted in the same institute. It is also much lower than that of previous report by Dutta et al.<sup>[11]</sup>. The reason for lower incidence is probably due to the effective implementation of the National Programme for Control of Blindness under which multiple eye camps are being conducted round the year.

This study observed that majority cases 60.78% occurred among females and 39.22% cases in males. Similar results were seen in a few other studies by Pradhan et al.<sup>[12]</sup> in 1994 and by Dhar et al.<sup>[13]</sup> The reason females were affected more may be due to socioeconomic and cultural constraints that play a role leading to neglect and late presentation of cataracts in females.

In this study highest cases occurred in age group 56-70 years. Pradhan et al.<sup>[12]</sup> found highest occurrence in 60-69 years of age. Similar observations were also made by Saikia AK.<sup>[10]</sup>

The study reported that the most frequent type of LIG was Phacomorphic glaucoma (58.86%) followed by Phacolytic glaucoma (33.33%). Similar occurrence was noted by Pranja et al. (52.68%)<sup>[14]</sup> and Pradhan et al. (72%)<sup>[12]</sup>

The onset of glaucoma in all cases were characterised by pain in and around the eyes with headache of varying intensity, nausea and vomiting. Redness and ciliary congestion were present in all affected eyes. In phacomorphic glaucoma patient complained of sudden severe diminution of vision in affected eye. Dhar et al.<sup>[13]</sup> also similar findings to our study with 100% diminution of vision, eye pain and redness of eyes in his series of 214 cases of lens induced glaucoma.

Majority of cases in this study 26 (50.98%) presented with pain and redness in first week after developing symptoms. The rest 25 cases (49.01%) presented after 1 week. In the study by Pradhan et al.<sup>[12]</sup> 70% of cases were reported after 10 days of onset of symptom.

In our series 49.02% of cases presented with IOP more than 40 mm of Hg and the mean IOP at presentation in our study was 42.54 mm of Hg. Dhar et al.<sup>[13]</sup> in his study reported mean IOP as 36.6 mm of Hg in affected eye.

## CONCLUSION:

LIG is an important vision threatening complication of cataract. The crystalline lens plays an important role in the mechanism of rise in IOP. Early diagnosis and treatment of mature cataract is very important to reduce the incidence of LIG as well as to avoid poor visual outcome. There is a great need to impart health education to the public about the importance of timely management. The role of community outreach programme in early diagnosis of cataract cannot be undermined because success of such initiatives will lead to decrease in the incidence of Lens Induced Glaucoma in the community.

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