



CLINICAL STUDY OF LENS INDUCED GLAUCOMA IN RURAL BASED TERTIARY CARE HOSPITAL

KEYWORDS

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ABSTRACT

Background – Lens induced glaucoma is a common condition seen in patients with senile cataracts

The aim of this study is to find the incidence of lens induced glaucoma and also clinical presentation of lens induced glaucoma

Method: The study was prospective, cross sectional, hospital based study over a period of one and a half year, in a rural based tertiary care hospital

Results- 115 cases presented with lens induced glaucoma (phacomorphic and phacolytic). The most common type is phacomorphic glaucoma which accounted for 68.7%. Mean age was 66.0 ± 9.19 , with female preponderance (62.61%). The main presenting complaints were eye pain, redness and diminution of vision (100%). All 36 cases of phacolytic glaucoma presented with hypermature cataract. The mean intraocular pressure lens induced glaucoma eyes was 41.35 ± 9.75 and 45.85 ± 7.09 in phacomorphic glaucoma and phacolytic glaucoma respectively.

Conclusion- Lens induced glaucoma is preventable and curable disease. The main clinical presentation of lens induced glaucoma is eye pain, redness and diminution of vision, which are the warning signs in a patient with cataract. Early detection is important for early management of the condition.

INTRODUCTION

Group of glaucomas that share the lens as a common pathway in their pathogenesis is called lens induced glaucoma¹. Lens induced glaucoma is a common condition seen in patients with senile cataracts and is one of the commonest cause of secondary glaucoma that requires immediate attention and management to prevent blindness². The management of lens induced glaucoma is essentially surgical. The prognosis of visual recovery in cases of lens induced glaucoma remains guarded unless diagnosed and managed early.

It is important to distinguish phacomorphic and phacolytic glaucoma. Mature cataract or intumescent cataract can induce angle closure and thus leading to phacomorphic glaucoma. In phacolytic glaucoma, due to loss of high molecular lens protein through intact lens capsule which are engulfed by macrophages which blocks the trabecular meshwork.

This study was undertaken to outline to know the incidence and to study the different characteristics of lens induced glaucoma.

Material and Methods: The study was a prospective, cross sectional, hospital based study. All consecutive patients diagnosed as LIG (phacomorphic and phacolytic) on the basis of clinical signs were enrolled and examined during the period of one and a half year. Cases of primary glaucoma, secondary glaucoma other than lens induced glaucoma, traumatic cataract with lens particle glaucoma, lens induced glaucoma due to subluxation / dislocation and patients not giving consent were excluded.

The duration and progression of diminution of vision of one or both eyes, onset of pain, redness, watering in the affected eye was noted. Each study subject underwent a comprehensive ocular examination comprising of visual acuity, anterior segment evaluation by slit lamp biomicroscopy for assessment of anterior chamber depth, lens status and to determine the type of lens induced glaucoma. At presentation visual acuity of both eyes using snellens chart was recorded and retinal function test was done by assessing the perception of light and

projection of rays. Intraocular pressure of both eyes using Schiotz tonometer was recorded. Gonioscopy was done and optic disc of other eye was assessed to rule out any evidence of glaucoma..

Phacomorphic glaucoma was recognized by the complaints of pain, redness, diminution of vision with the presence of corneal edema, shallow anterior chamber, fixed dilated pupil and an intumescent / mature cataract. Phacolytic glaucoma was diagnosed by the presence of pain, redness, diminution of vision, corneal edema with normal or deep anterior chamber, flare, cells, with minimal KPs and the presence of mature or hypermature cataract.

B-scan was done in the affected eye as the fundus was not visible to rule out posterior segment pathology.

Other routine tests like lacrimal syringing, keratometry & A scan biometry were done. IOP was controlled with medical management and after obtaining a written informed consent patients were subjected to extracapsular cataract extraction with PC IOL implantation.

RESULTS

Magnitude of Lens induced glaucoma

Out of 11087 senile cataract cases, 115 cases presented with lens induced glaucoma (phacomorphic and phacolytic type); constituting 1.04% of the total cataract cases. (Table I, Figure 1)

Table I: Magnitude of Lens induced glaucoma

	No. of Cases	Percentage (%)
Total no. of senile cataract cases admitted in ward during study period	11087	100
Total no. of Lens induced glaucoma cases (phacomorphic and phacolytic type)	115	1.04

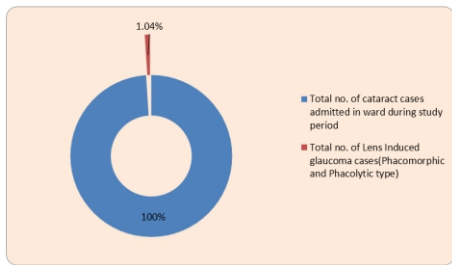


Figure 1: Magnitude of lens induced glaucoma

Distribution of type of lens induced glaucoma

Out of 115 cases of lens induced glaucoma, phacomorphic glaucoma was present in 79 patients (68.7%) and phacolytic glaucoma was present in 36 patients (31.3%). (Table 2, Figure 2)

Table 2: Distribution of type of Lens induced glaucoma

Type	No. of Cases	Percentage(%)
Phacomorphic LIG	79	68.7
Phacolytic LIG	36	31.3
Total	115	100

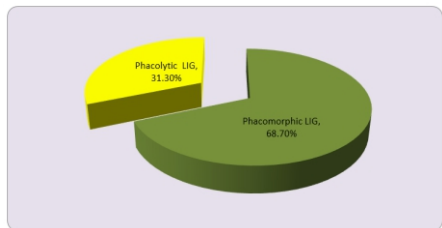


Figure 2 Distribution of type of lens induced glaucoma

AGE WISE DISTRIBUTION OF PATIENTS OF LIG

The mean age at presentation for phacomorphic glaucoma was 65.73±9.77 years (range 42-86), and mean age for phacolytic glaucoma was 66.88±7.85 years (range 45-87). (Table 3, Figure 3)

Table 3: Age wise distribution of patients of LIG

Age Group(years)	No. of Cases n (%)	Phacomorphic glaucoma n (%)	Phacolytic glaucoma n (%)
40-49	6(5.22%)	5(4.35%)	1(0.87%)
50-59	11(9.57%)	10(8.70%)	1(0.87%)
60-69	47(40.87%)	28(24.35%)	19(16.52%)
70-79	41(35.65%)	27(23.48%)	14(12.17%)
≥80	10(8.70%)	9(7.83%)	1(0.87%)
Total	115(100%)	79(68.70%)	36(31.30%)
Mean Age	66.09	65.73	66.88
SD	9.19	9.77	7.85
Range	42-87	42-86	45-87

$\chi^2=0.38$, p-value=0.53 showing that no significant association existed in the age group among the phacomorphic and phacolytic glaucoma. (Table 3, Figure 3)

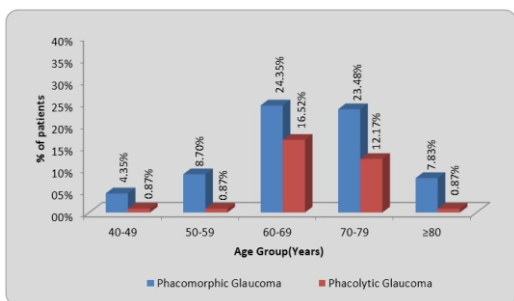


Figure 3: Age wise distribution of patients of LIG

GENDER WISE DISTRIBUTION OF PATIENTS

There was female preponderance compared to male. Among phacomorphic glaucoma 27(23.48%) were male and 52 (45.22%) were female. Among phacolytic group 16 (13.91%) were male and 20 (17.39%) were females. (Table 4 and Figure 4)

Table 4 Gender wise distribution of patients of LIG

Gender	No. of Cases	Phacomorphic Glaucoma	Phacolytic Glaucoma
Male	43(37.39%)	27(23.48%)	16(13.91%)
Female	72(62.61%)	52(45.22%)	20(17.39%)
Total	115(100%)	79(68.70%)	36(31.30%)

(χ^2 -value 1.11, p= 0.29)

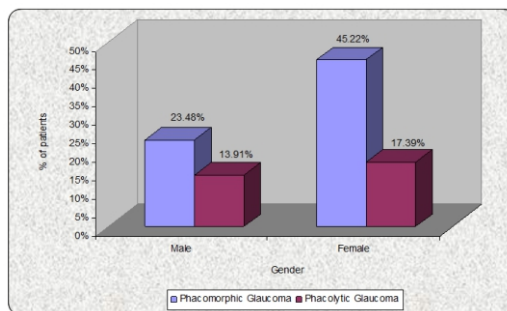


Figure 4: Gender wise distribution of patients of LIG

DISTRIBUTION OF PATIENTS ACCORDING TO THEIR PRESENTING COMPLAINTS

Patients with lens induced glaucoma presented with complaints of eye pain, redness, watering, diminution of vision, headache, and nausea/vomiting. Eye pain, redness and diminution of vision of the involved eye was present in all (100%) (Table 5, Figure 5)

Table 5: Distribution of patients according to their presenting complaints

Presenting Complaints	Phacomorphic Glaucoma	Phacolytic Glaucoma
Diminution of vision	79(100%)	36(100%)
Eye Pain	79(100%)	36(100%)
Redness of Eye	79(100%)	36(100%)
Watering	64(81.01%)	28(77.77%)
Headache	64(81.01%)	30(83.33%)
Nausea/ Vomiting	10(12.65%)	4(11.11%)

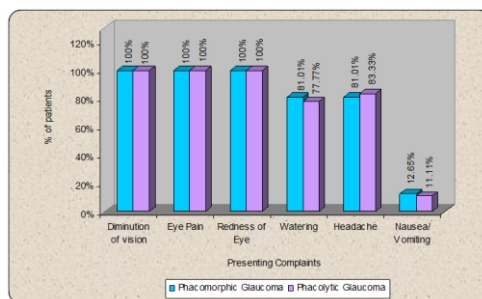


Figure 5: Distribution of patients according to their presenting complaints.

Table 6: Visual acuity in affected eyes at presentation

In this study, it was observed that none of the cases at presentation had visual acuity better than hand movement close to face. (Table 6, Figure 6)

Visual acuity	No. of eyes	Percentage %
HMCF with accurate projection of rays	7	6.09
PL with accurate projection of rays	65	56.52
PL with defective projection of rays	34	29.57
No Perception of Light	9	7.83
TOTAL	115	100%

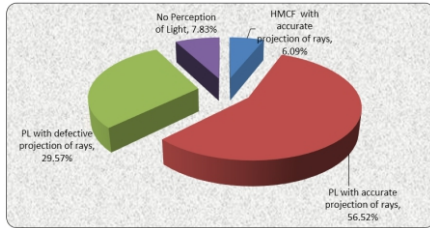


Figure 6: The visual acuity in affected eyes at presentation

ANTERIOR CHAMBER DEPTH IN EYES OF LIG

All the 79 eyes (100%) of phacomorphic glaucoma had shallow anterior chamber whereas in phacolytic glaucoma - normal anterior chamber depth was present in 20 eyes (55.56%) and deep anterior chamber in 16 eyes (44.44%). (Table 7, Figure 7)

Table 7: Anterior Chamber depth in eyes of LIG

Anterior Chamber	No of eyes	Phacomorphic Glaucoma	Phacolytic Glaucoma
Shallow	79	79(100%)	0(0%)
Normal	20	0(0%)	20(55.56%)
Deep	16	0(0%)	16(44.44%)
Total	115	79(100%)	36(100%)

χ^2 -value= 200, p-value <0.0001

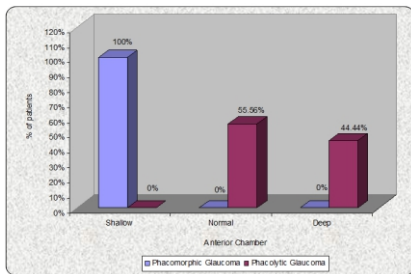


Figure 7: Anterior chamber depth in eyes of LIG

LENS STATUS IN LIG

Out of 79 cases of phacomorphic glaucoma 52 cases (65.82%) presented with intumescent cataract and 27 cases (34.18%) with mature cataract. All 36 cases of phacolytic glaucoma presented with hypermature cataract. (Table 8, Figure 8)

Table 8: Lens status in LIG

Lens Status	Phacomorphic LIG	Phacolytic LIG
Intumescent cataract	52(65.82%)	0(0%)
Mature Cataract	27(34.18%)	0(0%)
Hypermature Cataract	0(0%)	36(100%)
Total	79(100%)	36(100%)

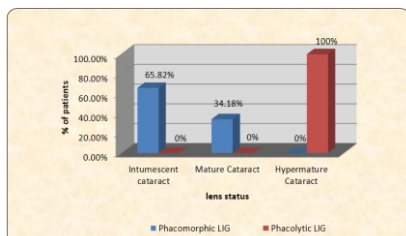


Figure 8: Lens status in LIG

INTRAOCULAR PRESSURE AT PRESENTATION IN LIG

In our study the mean intraocular pressure on admission in lens induced glaucoma eyes was 42.76± 9.21, The percentage of Intraocular pressure of more than 41 mmHg was higher for phacolytic glaucoma. (Table 9, Figure 9)

Table 9: Intraocular pressure at presentation in LIG

IOP(mmHg) on admission	No of eyes	Phacomorphic Glaucoma	Phacolytic Glaucoma
20-30	6	06(7.59%)	00(0%)
31-40	36	28(35.44%)	08(22.22%)
41-50	48	29(36.71%)	19(72.78%)
>50	25	16(20.25%)	09(25%)
Total	115	79(100%)	36(100%)

(χ^2 -value=21.60, p-value=p<0.0001)

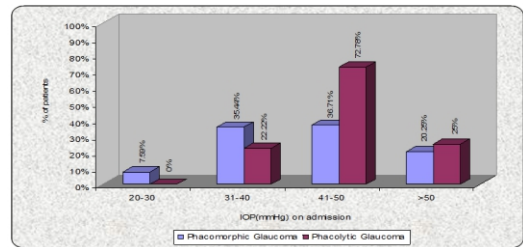


Figure 9: Intraocular pressure at admission in LIG

DISCUSSION

Lens induced glaucoma is not uncommon in our population. Lens induced glaucoma are a common occurrence in India, where the incidence of cataract cases far exceeds the total number of surgeries performed currently. The magnitude of LIG in our study was 1.04% (Table 1) as against 1.5% in Lahan study³

The most common type of LIG secondary to senile cataract comes out to be phacomorphic glaucoma (Table 2), several other studies also showed that phacomorphic glaucoma is the most common type of LIG^{3,4}

The mean age a presentation was 66.88±7.85 years with range of 45-87.(Table 3) In our study the highest incidence of LIG was found in age group 60-69 years. which is consistent with studies of Dhar et al., Pradhan et al., Prajna et al., Angra et al.^{2,3,4,5}

We observed that females seemed to have an increasing risk of having LIG as compared to males which is consistent with study of Prajna et al, they also found marginally significant increased risk of having LIG in females(p=0.055),⁴ several other studies also had similar findings.^{2,3,5,6}

Eye pain, redness and diminution of vision of the involved eye was present in all the cases(100%), other complaints were headache, nausea and vomiting (Table 5); various studies also showed similar presentations.^{2,7}

Thus from this study one can conclude that the warning signs of lens induced glaucoma are diminution of vision, eye pain and redness of eyes. This is important from clinical point of view as soon as such signs in a patient of cataract is noticed, it should be managed as early as possible.

In our study it was observed that none of the cases at presentation had visual acuity better than hand movement close to face(Table 6). In our study 100% of phacomorphic glaucoma had shallow anterior chamber, whereas normal to deep anterior chamber was seen in phacolytic glaucoma (Table7), Prajna et al., in their study out of 93 LIG, 49 cases of phacomorphic LIG had shallow anterior chamber

and 44 were phacolytic with normal or deep anterior chamber.⁴ Majority of eyes diagnosed as Phacolytic glaucoma were found to be hypermature cataract⁷, in our study all 36 cases of phacolytic glaucoma presented with hypermature cataract.(Table8).

The mean intraocular pressure on admission in lens induced glaucoma eyes was 41.35 ± 9.75 in phacomorphic glaucoma and 45.85 ± 7.09 in phacolytic glaucoma (Table 9) for which medical line of treatment was given preoperatively to lower intraocular pressure followed by cataract extraction.

Conclusion

Lens induced glaucoma is preventable and curable disease. The main clinical presentation of lens induced glaucoma is eye pain, redness and diminution of vision, which are the warning signs in a patient with cataract. Early detection is important for early management of the condition.

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