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Comparative study of early versus delayed presentation of lens induced glaucoma: A retrospective study conducted among population in remote hilly areas of Uttarakhand

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ABSTRACT

Aim: To compare the causes and visual outcome of lens induced glaucoma amongst those presenting early (within 7 days) with those presenting late (after 7 days).**Materials and Methods:** This was a retrospective study which included a total of 50 cases diagnosed as lens induced glaucoma. Patients were divided into two groups- group A presenting within 7 days and group B presenting after 7 days. All the patients underwent manual small incision cataract surgery with PMMA lens implantation. Visual outcome and intraocular pressure in both the groups preoperatively and on postoperative day 30 were compared.**Results:** Majority of patients were females and in the age group of 61-70 years. Phacomorphic glaucoma was the main cause of lens induced glaucoma accounting for 64% of the cases. Good vision in the other eye was the most common reason of delay in seeking medical aid (45.45%). Postoperative day 30 assessment of visual outcome showed that majority of group A patients had a visual acuity of 6/6 to 6/12. Group B patients showed majority with visual acuity of 6/18 to 6/60. Postoperative IOP of 74% patients was well controlled below 21 mm Hg at 1 month.**Conclusion:** The final BCVA in our study was found to be better in those who presented early, highlighting the importance of early diagnosis and efficient management.This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.For reprints contact: reprint@ipinnovative.com

1. Introduction

Glaucoma is a diverse group of eye diseases with a 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 defect, in which raised intraocular pressure is a major and only modifiable risk factor.¹

Cataract is the leading cause of preventable and reversible blindness accounting for 62.6% cases.^{2,3} If untreated, it can lead to an elevated intraocular pressure

and compromise optic nerve function. Lens induced increase in intraocular pressure, known as lens induced glaucoma, can be a result of lens dislocation, intumescent cataract (phacomorphic glaucoma), lens protein blocking the trabecular meshwork (phacolytic glaucoma) and inflammation due to phacoanaphylaxis. Amongst these, phacomorphic glaucoma from untreated senile mature and hypermature cataract most commonly lead to lens induced glaucoma.

A delayed management can cause irreversible damage to optic nerve leading to a permanent decrease or loss of vision even after surgical management of cataract. Although

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a significant number of studies have been conducted in the past to study the clinical profile of lens induced glaucoma, literature on comparative studies based on time of presentation of lens induced glaucoma is scarce.

In this study an attempt has been made to evaluate and compare the causes & visual outcome of lens induced glaucoma amongst those presenting early (within 7 days) with those presenting late (after 7 days) during covid-19 pandemic in a tertiary care centre.

2. Materials and Methods

This was a retrospective study which included a total of 50 cases diagnosed as lens induced glaucoma who underwent manual small incision cataract surgery from August 2019 to Feb 2022. Patients with complicated cataract, traumatic cataract, known cases of primary open angle glaucoma, with previous posterior segment pathology, corneal scarring or opacity and other cases of secondary glaucoma were excluded from the study.

Patients were divided into two groups- group A and group B. Group A consisted of patients presenting early within 7 days of onset of symptoms of lens induced glaucoma. Group B consisted of patients who presented late after 7 days of onset of symptoms. Based on earlier reports, this cut off period was taken.^{4,5}

Preoperative data included patient demography, detailed history, complete ophthalmic examination with visual acuity, IOP measurement, slit lamp examination findings, lens status of other eye (phakic, aphakic or pseudophakic) and a questionnaire about the reasons for their late presentation.

All patients were admitted and treated with topical antibiotic-steroid drops 2 hourly, timolol 0.5% and brimonidine 0.2% three times a day, cyclopentolate 2% three times a day and oral acetazolamide 250mg 8 hourly. In patients with IOP>40 mmHg, intravenous mannitol 20% (1-2g/kg body weight) over 30 minutes was given. Once the acute episode was controlled, patients were undertaken for manual small incision cataract surgery with Poly Methyl Metha Acrylate (PMMA) intraocular lens implantation under peribulbar anesthesia. All the patients were operated by the same surgeon. Postoperatively all patients received antibiotic-steroid drop, cycloplegic, antiglaucoma drops for required period. Oral steroid was given if required.

Postoperative vision, IOP, the anterior segment and fundus were evaluated at 1 month.

3. Results

A total of 50 patients were included in the study out of which 31 were females and 19 were males. Group A had 28 patients (11 males and 17 females) and group B had 22 patients (8 males and 14 females). Majority of patients were in the age group of 61-70 years (Table 1).

Mean age of patients with phacomorphic glaucoma was 59+9 years and of those with phacolytic glaucoma was 65+10 years.

Table 1: Total no of patients, demographic data

Age group	Group A		Group B		Total
	Male	Female	Male	Female	
51-60	2	0	0	0	2
61-70	5	13	3	10	31
71-80	4	4	5	3	16
>80	0	0	0	1	1
Total	11	17	8	14	50

Table 2: Distribution of lens induced glaucoma patients

Types of Lens induced glaucoma	Number of patients	Percentage (%)
Phacomorphic	32	64
Phacolytic	16	32
Dislocated lens induced glaucoma	2	4
Total	50	100

Phacomorphic glaucoma was the main cause of lens induced glaucoma accounting for 64% of the cases followed by phacolytic glaucoma (Table 2).

Table 3: Causes of delayed presentation after 7th day

Reasons for late presentation	Males	Females	Total
Good vision in other eye	4	7	11
Delay due to covid-19 pandemic	1	3	4
Money issues	0	2	2
Lack of awareness	1	2	3
Family issues	0	1	1
Fear of surgery	0	1	1
Total	8	14	22

As shown in Table 3, it was observed that good vision in the other eye was the most common reason of delay in seeking medical aid (45.45%), followed by delay due to COVID-19 pandemic (18.18%).

At the time of presentation, majority of patients in both group A and group B had vision of 6/60 to hand movements (Table 4).

Postoperative day 30 assessment of visual outcome showed that majority of group A patients had a visual acuity of 6/6 to 6/12. Group B patients showed majority with visual acuity of 6/18 to 6/60 (Table 5).

Greater number of patients (66%) at the time of presentation had an intraocular pressure of 41-50 mmHg. Postoperative IOP of 74% patients was well controlled below 21 mm Hg at 1 month (Table 6).

Table 4: Visual status at the time of presentation

Visual status at the time of presentation	Group A		Group B	
	No. of patients	Percentage	No. of patients	Percentage
PL +	1	3.6	2	9.09
<6/60 to HM	24	85.71	19	86.36
6/36 to 6/60	3	10.71	1	4.54
Total	28		22	

Table 5: Visual outcome at day 30

Visual outcome at day 30	Group A		Group B	
	No. of patients	Percentage	No. of patients	Percentage
6/6 to 6/12	17	60.71	7	31.81
6/18 to 6/60	9	32.14	11	50
<6/60	2	7.14	4	18.18
Total	28		22	

Table 6: Comparison of preoperative and postoperative IOP in patients

IOP (mmHg)	Preoperative IOP	Postoperative IOP (at 1 month)
<21	0	37
22-30	0	13
31-40	7	0
41-50	33	0
>50	10	0

4. Discussion

In this study, the incidence of LIG was shown to be more in females with male to female ratio of 9:16. This was similar to studies conducted by Prasad M,⁶ Rijal AP et al.,⁷ Pradhan D et al⁸ and Jayakumar S et al.⁹ This could be attributed to socioeconomic constraints giving lesser attention to females. Another reason could be the fact that females have a shallow anterior chamber making it more prone to closure as compared to males.

Our study showed that the majority of the patients were in the age group of 61-70 years which is consistent with studies conducted by Jarwal PN,¹⁰ Sheshrao MU et al¹¹ and Rathi M et al¹² indicating that lens induced glaucoma is an entity of old age.

In our study phacomorphic glaucoma was the main cause of lens induced glaucoma accounting for 64% of the cases followed by phacolytic glaucoma. Similar results were seen in studies by Shrestha R et al¹³ and Kothari R et al.¹⁴

Various causes of delayed presentation (>7 days) were identified, the most common being good vision in other eye. Similar observations were made in a study by Ayub R et al.¹⁵ As our study period included the covid-19 pandemic period, delay due to COVID-19 pandemic restrictions was also seen in 18.18% of the patients.

Visual outcome in both the groups showed a remarkable difference wherein 60.71% of patients in group A attained 6/12 to 6/6 vision compared to 31.31% in group B. This is consistent with the study conducted by Sheshrao MU et al¹¹ which showed visual outcome of 6/12 to 6/6 in 64%

of patients presenting within 7 days and in 33% of patients presenting after 1 week. Naik VN et al⁴ in a study showed similar results wherein 60% patients treated within 7 days had visual outcome of 6/12 or more.

In the present study, majority of patients had postoperative IOP well controlled below 21mmHg, as seen in studies by Tyagi R et al,¹⁶ Noman SM¹⁷ and Jayakumar S et al.⁹

5. Conclusion

Lens induced glaucoma affects elderly with higher prevalence among female population. Majority of the cases were of phacomorphic glaucoma due to untreated cataract. The final BCVA in our study was found to be better in those who presented early, highlighting the importance of early diagnosis and efficient management. Ignorance due to better vision in other eye emerged to be the most important factor for delayed presentation. It is unfortunate that this preventable and curable condition is still prevalent in our country emphasizing the importance of imparting public health education and creating awareness about cataract, its implications and timely management.

6. Source of Funding

None.


7. Conflict of Interest

None.

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