A non randomized clinical study of posterior chamber intra ocular lens implantation in lens induced glaucoma

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Abstract

Background: Lens-induced glaucoma comprises a number of different glaucomatous processes occurring, that share in common the role of the crystalline lens in the mechanism of increase in intraocular pressure. Irrespective of the mode of presentation the treatment has been towards a single focus. Removal of cataractous lens and intra ocular lens (IOL) implantation, if needed glaucoma surgery.

Aim: The main aim is to study the surgical outcome of lens induced glaucoma patients following posterior chamber intraocular lens implantation.

Material and methods: Fifty patients of clinically proven lens induced glaucoma patients attending ophthalmic OPD in Government general hospital, Gulbarga, were selected from march 2002 to January 2004. Results were tabulated using Microsoft excel 2010 and expressed in tables and graphs.

Results: Majority of patients were between 61-70yrs (42%). Only 8% have seeked medical attention within 7 days of onset of the symptoms. 50% of cases had preoperative intraocular pressure (IOP) of 30-50mmHg. 88% of them had phacomorphic glaucoma. Following extracapsular cataract extraction (ECCE) with posterior intraocular PCIOP on 96% of cases and 4% had peripheral iredectomy following PCIOP. Severe iritis (45%) is the common postoperative complications. Visual recovery after 6weeks were noted in 72% with visual acuity 6/12-6/36.

Conclusion: The outcome mostly depend on the timining, when the patient approaches medical help. Patient treated early with IOP less than 50 has better prognosis. ECCE with PCIOL implantation is preferred treatment for lens induced glaucoma patients if presented early.

Key Words: Lens Induced Glaucoma, Posterior chamber Intraocular Lens.

Introduction

Lens-induced glaucoma can be subdivided into two major categories. The first category relates to a blockage of the anterior flow of the aqueous humor from the lens that results in an increase of intraocular pressure (IOP). Conditions included in this category is pupillary block glaucoma caused by an intumescent cataractous lens (phacomorphic glaucoma). The second category is characterized by the blockage of the trabecular meshwork from lens proteins (phacolytic glaucoma), lens material or debris, and rarely by phacoanaphylactic response to lens material[1].

Pupillary block glaucoma

This type of glaucoma is characterized by the obstruction of the aqueous outflowby the apposition of the iris root to the trabecular meshwork. Eyes which develop angle-closure glaucoma secondary to pupillary block have been observed to have several predisposing anatomic factors. The most important factor is a shallow anterior chamber. The depth of the chamber is dependent on the

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dimensions of the lens, the cornea, and the axial length of the globe. With aging, the lens assumes greater thickness, a greater curve of its anterior surface, and the zonules loosen[2-5]. These factors cause increasing shallowness of the anterior chamber and iridolenticular contact[6], which results in a greater amount of pupillary block[4]. As a consequence, hyperopic eyes have a propensity for pupillary block. A senile cataractous lens that has progressed enough to become intumescent, has an increased anteroposterior length, which could lead to pupillary block. This type of glaucoma is named phacomorphic.

Phacolytic glaucoma

This acute open-angle glaucoma is the result of the leakage of lenticular material from senile hypermature or Morgagnian cataract through an intact lens capsule. The original theory about the pathogenesis of this condition was that the macrophages were the major culprit of increase in IOP by blocking the trabecular meshwork[7,8]. Later research by Epstein and colleagues[9] and Dueker[10] emphasized the role of heavy molecular proteins (HMW) leaking from the lens in the obstruction of the aqueous outflow and de-emphasized the role of the macrophages. As a consequence, the examination of the anterior chamber fluid for the presence of HMW protein has become an important diagnostic aid in suspected and atypical cases of phacolytic glaucoma, but is not yet widely available[7-10].

Aim The main aim is to study the surgical outcome of lens induced glaucoma patients following posterior chamber intraocular lens implantation.

Materials & Methods

Study population:

Patients attending glaucoma clinic in government general hospital, Gulbarga were taken into consideration for the study. 50 patients of clinically diagnosed 'lens induced glaucoma' and who were fulfilling the inclusion and exclusion criteria from march 2002 to January 2004 were taken into the study.

Inclusion criteria

1.Phacomorphic glaucoma

Patients with complaints of pain and redness associated with presence of corneal edema, shallow anterior chamber, an intumeacent cataractous lens and intaoccular pressure above 21mmHg.

2.Phacolytic glaucoma

Patients with complaints of pain, corneal edema, normal or deep anterior chamber containing floating lens particles and/or pseudohypopyon in severe cases.

The presence of a white hypermature morgagnian cataractous lens.

Exclusion criteria

1. Patients not willing to participate in the study.
2. Glaucoma secondary to ectopia lentis
3. Lens particle glaucoma
4. Glaucoma associated with phacoanaphylactic uveitis
5. Patient who have severe comorbid condition like cardiovascular, renal problems.
6. If its the only functioning eye

Study Design

Single centre, Non randomized, non control clinical study were started after obtaining the local ethical committee approval.

Management

Complete history and physical examination were done by the first author. Physical examination includes cardiovascular system, respiratory system, per abdomen and genitourinary tract and detailed examination of both the eyes. Status of lens and anterior chamber depth were assessed by slit lamp biomicroscopy. Intraocular pressure were noted by schiotz tonometry and gonioscopy was also done.

All patients were given uniform preoperative medication of Tab. Diamox 250mg qid, Timolol maleate 0.5% eye drops, IV Mannitol 100ml of 20% on the day of admission and on the day of operation.

In phacolytic glaucoma patients in order to control IOP , Betamethasone 0.1% eye drops 6 times a day, Timolol eye drops 0.5% twice a day, Atropine 1% eye drops twice a day with Tab.Acetazolamide 250mg four times a day were given.

Surgical management

All cases were done under peribulbar anaesthesia in general hospital, Gulbarga by the first author. All cases underwent extracapsular cataract extraction

with posterior intraocular lens (ECCE + PIOL) implantation. If there is involvement of peripheral anterior synechiae of 1/3 – 2/3 of the angle of the anterior chamber. Combined procedure is done i.e along with ECCE + PIOL trabulectomy is done. If needed apart from trabulectomy other types of anti glaucoma surgeries were also done based upon the intraoperative findings.

After surgery all patients were monitored in the hospital for 3 days. If no complications they were discharged on the third day with required topical, antibiotic, steroid combination for 6 weeks depends upon the patient. Follow up was done at 2,4 and 6th week. Total ophthalmic evaluation has been done for all patients by the first author. Post operative evaluation was considered based on the 6th week examination findings.

Statistical analysis

Data were documented and tabulated using Microsoft excel 2010. Means and proportions were calculated, results were expressed in tables and graphs.

Results

All patients are more than 40yrs old of which majority 42% are between 61-70yrs . Female patients are more 74%. Phacomorphic patients 88% are more when compared to phacolytic patients 12% (Table 1). More than patients 92% has approached medical advice only after 7days from the onset of symptoms (Table-2). More than half 54% had senile immature cataract and a little less than one fourth 24% has normal vision (Figure 1). More than 70% has intra ocular pressure more than 40mmHg.

Patients were stabilised first with medical line of treatment. Associated uvitis was controlled before surgical treatment. All patients underwent ECCE with PCIOL, only 2 needed combined procedure (Table 3). Seven patients had intraoperative complications, most common is vitreous loss occurred in 3 patients (Table 4). More than one third 40% had post operative complications, in which severe iritis is the most common (45%) (Figure 2).

All patients had been reviewed on 2nd, 4th and 6th week. Complete systemic and ophthalmic evaluation was done after 6 weeks. More than one

1. Distribution of study subjects according to Age, Sex and Type of Glaucoma

Age	Phacomorphic		Phacolytic		Total
	Male	Female	Male	Female	
Less than 40 yrs	1	0	0	0	1
40-50yrs	3	2	0	0	5
51-60yrs	3	10	0	0	13
61-70yrs	5	13	1	3	22
More than70 yr	2	7	0	0	9
Total	14	32	1	3	50

Table 2. Distribution of study subjects according to duration of illness

DURATION OF ATTACK	NO OF EYES	AVERAGE INITIAL IOP(mmHg)
1-7days	4	37.2
8-15days	24	43.4
16-30days	20	59.1
>30days	2	69.3
Total	50	

Table 3. Distribution of study subjects according to Type of surgery

TYPES OF SURGERY	NO OF CASES	%
Extracapsular lens extraction with PCIOL	48	96
Combined procedure	2	4
Total	50	100

fourth 28% has IOP more than 21mmHg. The post operative visual acuity was better 6/9-6/36 if pre operative IOP was less than 35mmHg and if they have seeked medical attention within 2 weeks of onset of symptoms (Table 5).

Table 4. Distribution of study subjects according to Intra Operative Complication

Intra Operative Complications	No	%
Vitreous loss	3	42
Posterior capsule rent	2	29
Hyphaema	2	29
Total	7	100

Table 5. Distribution of study subjects according to Pre Operative IOP & Post operative Visual acuity

POST OPERATIVE VISUAL ACUITY	PRESENT STUDY PREOPERATIVE IOP			
	<35mmHg	>35mmHg		
	No	%	No	%
6/9-6/12	10	20	7	14
6/18-6/36	1	2	18	36
=6/60	-	-	4	8
<6/60	-	-	10	20

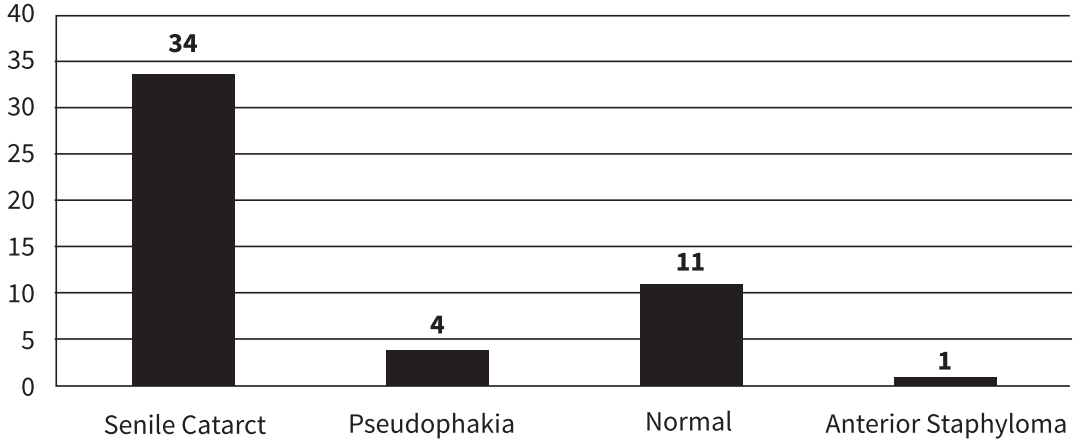

Figure 1. Distribution of study subjects according to Condition of the eye

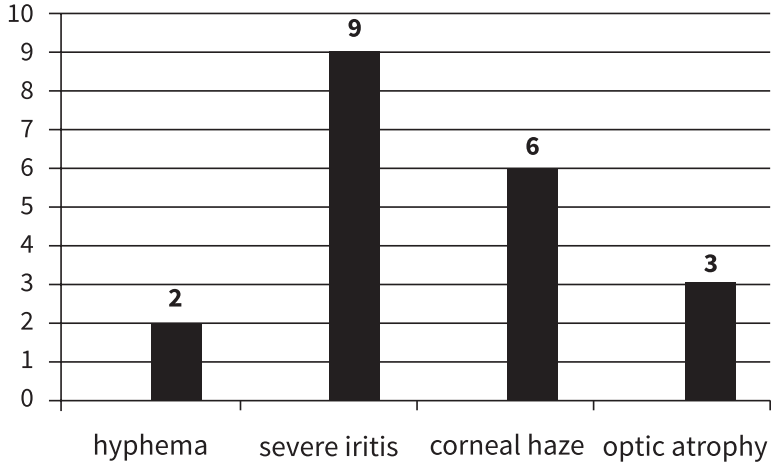

Figure 2. Distribution of study subjects according to Post operative complication

Discussion

The present study, results show the phacomorphic glaucoma is more common and if the patient had seeked medical advice soon after the onset of symptoms the postoperative outcome is better. These findings are in concordance with findings in other studies.

The incidence of lens induced glaucoma was more 88% after 50 yrs and common among female 75% which is similar when compared to study done by Ajith sinha et al[12] 80% and 75%, S.K Angra et al[13] 100% and 66% respectively. Female preponderance was most probably due to relatively shallow anterior chamber among female. Indian women get less medical attention hence the cataract even after maturity is left alone for long time, this accounting for high incidence of lens induced glaucoma. In the present study only 8% had seeked medical attention within 8 days in contrary to other studies 80% in Ajith sinha etal and 67.5% in G.L.Dhar et al[14].

The clinical presentation were almost similar as diminution of vision, eye pain, redness were present in all patients. 24% of the patients had normal vision in our study in contrary to nil in the study done by GL Dhar et al. In our present study 70% of the patients had IOP more than 40mmHg similar to 77% by Ajith Sinha et al .

Phacomorphic glaucoma is more common 88% in our study. This is in conformity with study done by G L Dhar and S K Angra et al 58.5% and 57.5%. Post operative IOP was between 16-20mmHg in most patients 66% in contrary to 10-15mmHg in most of the patients 80% in the study done by Ajit Sinha et al. The post operative visual acuity was better 6/9-6/36 if pre operative IOP was less than 35mmHg and if they have seeked medical attention within 2 weeks of onset of symptoms. This result were similar to other studies done by Venkatesh N Et al[15].

There fore, extracapsular cataract extraction with posterior chamber intraocular lens implantation is preferred treatment of choice in lens induced glaucoma patients. The timing you seek medical attention plays a vital role in outcome. More soon you approach medical personnel better results can be expected. Lens induced glaucoma is rare in developed countries for decades. But in India its still not an infrequent event. This is most commonly due to negligence of initial clinical symptoms and delay in seeking medical attention. Delay in seeking medical attention may be due to negligence or financial constrain or any other reason.

India is the first country to launch a National program for the control of blindness. The outcome is also promising as India's cataract surgery figures rose dramatically from about a million in early 1990s to more than 6 million by 2010. This may be a key for less phacolytic glaucoma patients. More awareness is needed to be created about glaucoma in the public. Regular ophthalmic evaluation in geriatric patients may be emphasised to control blindness.

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