



ORIGINAL RESEARCH PAPER

Ophthalmology

STUDY OF IOP MANAGEMENT BY SURGICAL MODALITIES SUCH AS COMBINED TRABECULECTOMY AND PHACOEMULSIFICATION SURGERY AND PHACOEMULSIFICATION SURGERY ALONE.

KEY WORDS:

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ABSTRACT

AIM:- Study of IOP management by surgical modalities such as combined trabeculectomy and phacoemulsification surgery and phacoemulsification surgery alone Study of complications of trabeculectomy with phacoemulsification surgery and phacoemulsification surgery alone **MATERIALS AND METHODS:-** A pre-designed prospective study was conducted at the OPD of upgraded Department of Ophthalmology at LLRM Medical College, Meerut Patients were randomly selected from the routine OPD over the period of June 2019 to June 2020 and diagnosed as a case of primary angle closure glaucoma with cataract. Among these, patients having intra ocular pressure between 22 – 27 mm Hg with cataract were subjected randomly to either a combined trabeculectomy and cataract surgery or b) cataract surgery alone. Clearance from institution ethics committee was obtained before the study was started. An informed consent was obtained from all the patients before including them in to the study. A total of 60 patients were divided in to two equal groups randomly. **RESULTS:-** A total of 60 patients were divided in to two equal groups randomly and studied. Majority of the patients in both the groups were aged between 61 – 70 years. The mean intra ocular pressure after 1 years follow up in combined surgery group was 10.8 mm Hg and 13.4 mm Hg in the cataract surgery alone groups which was statistically significant. Mean BCVA declined after 1 year of follow up in combined surgery group was 1.9 and 2.7 in cataract surgery alone group which was statistically significant. In combined surgery group, hypotony was the main complication in 13.3% of the patients followed by bleb leak, Choroidal detachment , PCR , and shallow AC. In cataract surgery alone group, about 13.3% of the patients had PCR followed by choroidal detachment , hyphema, Iritis, shallow AC and hypotony. **CONCLUSION:-** This study had found that, the reduction of intra ocular pressure in both the groups but more prominent in combined surgery group than cataract alone surgery group.

INTRODUCTION

Vision impairment is a major public health problem and is expected to lead higher burden as the number of aged population is increasing. Glaucoma is one of the leading cause of preventable blindness which is mainly due to chronic optic neuropathy with irreversible but preventable visual field loss and progressive optic nerve damage.¹

It has been estimated that, the glaucoma affects 60.5 million people around the world and is projected to increase to 79.6 million by the year 2020.²

The reports available shows that, 6.7 million people affected by glaucoma land up in blindness.

About 8 million Indians are known to be affected with glaucoma with 1:1 ratio of primary open angle glaucoma (POAG) to primary angle closure glaucoma (PACG).^{3,4}

A number of treatment modalities are available to treat glaucoma which mainly aims in prevention of future visual loss. They include medical, laser and surgical treatment. The evidence available in recent years show that the cataract extraction alone result in lowering the intra ocular pressure.

The intra ocular pressure in primary open angle glaucoma can be lowered by Glaucoma filtering surgery such as trabeculectomy. Cataract extraction along with trabeculectomy can compromise the filter's success. A study comparing the trabeculectomy alone with trabeculectomy combined with phacoemulsification had shown that, the combined surgery group required more IOP lowering medications than the trabeculectomy alone group.^{11,12}

But very few studies have compared the effect of cataract with trabeculectomy and cataract alone in this part of the country. Hence this study was undertaken to compare the effect of

cataract with trabeculectomy and cataract alone.

AIM AND OBJECTIVES

Study of IOP management by surgical modalities such as combined trabeculectomy and phacoemulsification surgery and phacoemulsification surgery alone.

Study of complications of trabeculectomy with phacoemulsification surgery and phacoemulsification surgery alone

REVIEW OF LITERATURE

In a randomized controlled trial by Paul et al (2014), Patients with PACG and cataract were randomized into two groups, comparing phacoemulsification (Group A) versus combined phacotrabeculectomy with (Group B). Group A had 60 eyes of medically controlled PACG with cataract and 58 eyes of medically uncontrolled PACG with cataract. Group B had 53 eyes of medically controlled PACG with cataract and 61 eyes of medically uncontrolled PACG with cataract. The two groups had identical study designs. All patients were reviewed 3-monthly for 2 years after surgery. The primary outcome measure was to compare the surgical complications of phacoemulsification versus phacotrabeculectomy and the secondary outcome measures were intraocular pressure (IOP) control and disease progression in the two groups. There was no statistically significant difference in IOP control, glaucomatous progression, or final visual acuity, during the 24-month follow-up, between two groups. In Group A, 5 (4.2%) of 118 eyes reported four surgical complications while in Group B, 18 (15.8%) of 114 eyes had 16 surgical complications. The difference in the proportion of eyes with one or more surgical complications between the two groups was statistically significant [P = 0.003, 95% confidence interval (CI)*]. In addition to this the risk of surgical complication with phacotrabeculectomy was significantly higher when compared to phacoemulsification [3.73 (P =

0.003, 95% CI, 1.43-9.70)]. They concluded that, Postsurgical complications were more frequently seen after phacotrabeculectomy. However, the data did not reveal statistically significant differences in IOP control, visual acuity, or disease progression between both groups.¹³

Manju et al (2016) conducted a prospective study which included 20 eyes of 17 patients planned for phacotrabeculectomy procedure. Preoperative evaluation included detailed ocular examination for the grade of cataract, glaucoma evaluation, and exclusion of ocular comorbidities. A superior trabeculectomy with mitomycin C and temporal phacoemulsification with in the bag intraocular lens implantation was performed. Postoperatively, improvement in the best corrected visual acuity, IOP control, and reduction in the number of antiglaucoma medications was evaluated. Patients were followed for a 6-month period. Postoperatively, all the patients had significant improvement in best corrected visual acuity (P < 0.0001) and significant reduction in IOP. The usage of antiglaucoma medication was lower (P < 0.0001) and 85% percent (17 eyes) had no complications. They concluded that, combined phacoemulsification and trabeculectomy is an effective and safe procedure to provide good visual acuity and control of intraocular pressure at the same time.¹⁴

MATERIALS AND METHODS

A pre-designed prospective study was conducted at the OPD of upgraded Department of Ophthalmology at LLRM Medical College, Meerut.

Patients were randomly selected from the routine OPD over the period of June 2019 to June 2020 and diagnosed as a case of primary angle closure glaucoma with cataract. Among these, patients having intra ocular pressure between 22 – 27 mm Hg with cataract were subjected randomly to either a combined trabeculectomy and cataract surgery or b) cataract surgery alone.

Patients diagnosed on the basis of shallow anterior chamber ,gonioscopy, slit lamp examination and IOP.

Clearance from institution ethics committee was obtained before the study was started. An informed consent was obtained from all the patients before including them in to the study. A total of 60 patients were divided in to two equal groups randomly.

Inclusion criteria-

Glaucomatous patients uncontrolled IOP with cataract on maximum medications.

Any patient having glaucoma and cataract with controlled IOP with medications ,with mild to moderate disc damage

Exclusion criteria-

Any patient having glaucoma and cataract with controlled IOP with medications with normal disc and visual field damage.

Any patient with cataract and glaucoma with bacterial, viral or fungal infection.

- Non willing patient.
- PL +ve but PR inaccurate or inconsistent patient.
- Patient with corneal decompensation
- Previous trabeculectomy was done

All the patients were subjected to complete ophthalmologic evaluation at baseline and 1 months including best corrected visual acuity (BVCA), IOP (mm Hg) measured with a calibrated Goldmann applanation tonometer.

RESULTS AND OBSERVATIONS

Table 1. Distribution of study group according to age groups

Age group	Combined surgery n (%)	Cataract surgery alone n (%)	Total n (%)
41 – 50 years	2 (6.7)	1 (3.3)	3 (5.0)
51 – 60 years	9 (30.0)	3 (10.0)	12 (20.0)
61 – 70 years	11 (36.7)	15 (50.0)	26 (43.3)
More than 70 years	8 (26.7)	11 (36.7)	19 (31.7)
Total	30 (100)	30 (100)	60 (100)

X² value=4.422 df=3 p value, sig=(0.219), NS

Table no. 1 shows that, about 36.7% of the patients undergoing combined surgery and 50% of the patients undergoing cataract surgery alone were aged between 61 – 70 years.

Table 2. Distribution of study group according to pre-operative IOP

IOP (Mean ± SD)	Combined surgery	Cataract surgery alone	T Value	P value, Sig
Pre- operative	23.3 ± 5.6	23.9 ± 5.8	0.384	0.702, NS

The mean pre operative intra ocular pressure was 23.3 mm Hg in combined surgery group and 23.9 mm Hg in cataract surgery alone group. (P value= 0.702)

Table 3. Distribution of study group according to no of preop medication

No. of pre op antiglaucoma medication	No. Preoperative cases (out of 60)	Percent(%)
Three	00	0
Two	04	6.67
One	06	10.0

This study had shown that, none of the patients were on three drug anti glaucoma medication, 6.7% were on two drugs and 10% were on one drug medication

Table 4. Distribution of study group according to IOP at follow up – 1 week

IOP (Mean ± SD)	Combined surgery	Cataract surgery alone	T Value	P value, Sig
Follow up – 1 week	17.5± 3.4	19.6± 3.0	2.578	(0.012) Sig

Mean intra ocular pressure 1 week after surgery in combined surgery group was 17.5 mm Hg and 19.6 mm Hg in cataract surgery alone group which was statistically significant.(P value=0.012)

Table 5. Distribution of study group according to IOP at follow up – 6 months

IOP (Mean ± SD)	Combined surgery	Cataract surgery alone	T Value	P value, Sig
Follow up – 6 months	15.2±1.86	17.4± 2.9	3.407	(0.001) Sig

The mean intraocular pressure 6 months after surgery was 15.2 mm Hg in combined surgery group and 17.4 mm Hg in cataract alone group. This difference was statistically significant between the combined surgery and cataract surgery alone groups.(P value=0.001)

Table 6. Distribution of study group according to IOP at follow up – 1 year

IOP (Mean ± SD)	Combined surgery	Cataract surgery alone	T Value	P value, Sig
Follow up – 1 year	15.2±1.86	17.4± 2.9	3.407	(0.001) Sig

Follow up – 1 year	10.8± 3.2	13.4± 2.2	3.624	(0.001), Sig
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Mean intra ocular pressure after 1 years follow up in combined surgery group was 10.8 mm Hg and 13.4 mm Hg in the cataract surgery alone groups which was statistically significant between the two groups. (P value=0.001)

Table no 7. Distribution of study group according to no. of post-op antiglaucoma medications

No. of post op antiglaucoma medication	Follow up	Combine d surgery group(out of 30)	Cataract surgery alone group(ou t of 30)	χ ² value	P value
Three	3 month	00	00	0.0	1.0
Two	6 month	00	01	1.017	0.313
One	1 year	02	04	0.741	0.389

None of the patients in this study belonging to both the groups were using three drugs at 3 months follow up. About 3.3% of the patients in the cataract alone group were using two drugs. About 6.7% patients in combined group and 13.3% patients in cataract surgery alone group were using one anti glaucoma medication at the end of one year of follow up.

Table 8. Distribution of study group according to Follow up BCVA – 1 year

BCVA (Mean ± SD)	Combined surgery	Cataract surgery alone	T Value	P value, Sig
Follow up – 1 year	1.9 ± 0.74	2.7 ± 0.9	3.568	(0.001), Sig

Mean BCVA after 1 year of follow up in combined surgery group was 1.9 and 2.7 in cataract surgery alone group. This difference was statistically significant between the two groups. (P value=0.001)

Table 9. Distribution of study group according to Complications

Complications	Combined surgery n (%)	Cataract surgery alone n (%)	Total n (%)
Bleb leak	3 (10.0)	0	3 (5.0)
Choroidal detachment	2 (6.7)	3 (10.0)	5 (8.3)
Hyphema	0	2 (6.7)	2 (3.3)
Hypotony	4 (13.3)	1 (3.3)	5 (8.3)
Iritis	0	2 (6.7)	2 (3.3)
Shallow AC	1 (3.3)	2 (6.7)	3 (5.0)
PCR	2 (6.7)	4 (13.3)	6 (11.6)

In combined surgery group, hypotony was the main complication in 13.3% of the patients followed by bleb leak in 10.0%, Choroidal detachment in 6.7% of the cases and shallow AC in 3.3% of the cases. In cataract surgery alone group, about 13.3% of the patients had posterior capsule rupture (PCR) followed by choroidal detachment in 10.0% of patients, and followed by hyphema, Iritis, shallow AC in 6.7% of the patients each and hypotony in 3.3% of the cases

DISCUSSION

Vision impairment is a major public health problem and the burden is increasing with increase in aged population.⁵

PACG is a multifactorial optic neuropathy where there is characteristic atrophic change of the optic nerve with associated visual filed defects.⁵ Early diagnosis and treatment requires recognition of all the risk factors for PACG. Early diagnosis with prompt treatment can halt the progression of the disease and thus preserve the loss of vision.^{5,10}

But very few studies have compared the effect of cataract with trabeculectomy and cataract alone in this part of the country.

Hence this study was undertaken to compare the effect of cataract with trabeculectomy and cataract alone.

A pre-designed prospective study was conducted at the OPD of upgraded Department of Ophthalmology at LLRM Medical College, Meerut. A total of 60 patients were divided in to two equal groups randomly and studied.

Intra Ocular pressure

The mean pre- operative intra ocular pressure was 23.3 mm Hg in combined surgery group and 23.9 mm Hg in cataract surgery alone group which was not statistically significant between the two groups. Mean Intra ocular pressure decreased regularly in each follow up more in combined group than the cataract surgery alone group with use of anti-glaucoma medications. The mean intra ocular pressure after 1 years follow up in combined surgery group was 10.8 mm Hg and 13.4 mm Hg in the cataract surgery alone groups which was statistically significant

BCVA

Mean BCVA before the operation was 3.2 in combined surgery group and 3.8 in cataract surgery before surgery. Mean BCVA declined after 1 year of follow up in combined surgery group was 1.9 and 2.7 in cataract surgery alone group which was statistically significant.

No of anti glaucoma medications

Before surgery in this study, none of the patients were on three drug anti glaucoma medication, 6.7% were on two drugs and 10% were on one drug medication. None of the patients in this study belonging to both the groups were using three drugs at 3 months follow up. About 3.3% of the patients in the cataract alone group were using two drugs. About 6.7% patients in combined group and 13.3% patients in cataract surgery alone group were using one anti- glaucoma medication at the end of one year of follow up.

Complications

In combined surgery group, hypotony was the main complication in 13.3% of the patients followed by bleb leak, Choroidal detachment, PCR and shallow AC. In cataract surgery alone group, about 13.3% of the patients had posterior capsule rupture (PCR) followed by choroidal detachment, hyphema, Iritis, shallow AC and hypotony

CONCLUSION

This study was mainly undertaken to study the efficacy of combined trabeculectomy with cataract extraction and cataract only on primary angle closure glaucoma. This study had found that, the reduction of intra ocular pressure in both the groups but more prominent in combined surgery group than cataract alone surgery group. The best corrected visual acuity was also better in combined surgery group than cataract alone surgery group. The rate complications was more in combined surgery group than cataract surgery alone group. But this study is not without limitations. The sample size was small to generalize the results. The time of follow up was also small to refute the results. Hence a study with elegant methodology is required to bring out more facts about the role surgeries in treatment of Primary angle closure glaucoma.

SUMMARY

Vision impairment is a major public health problem and the burden is increasing with increase in aged population.

- A pre-designed prospective study was conducted at the OPD of upgraded Department of Ophthalmology at LLRM Medical College, Meerut. A total of 60 patients were divided in to two equal groups randomly and studied.
- Majority of the patients in both the groups were aged between 61 – 70 years.

- Females outnumbered males in this study which was statistically significant between the two groups.
- The mean pre- operative intra ocular pressure was 23.3 mm Hg in combined surgery group and 23.9 mm Hg in cataract surgery alone group.
- Mean Intra ocular pressure decreased regularly in each follow up more in combined group than the cataract surgery alone group. The mean intra ocular pressure after 1 years follow up in combined surgery group was 10.8 mm Hg and 13.4 mm Hg in the cataract surgery alone groups which was statistically significant.
- Mean BCVA before the operation was 3.2 in combined surgery group and 3.8 in cataract surgery before surgery. Mean BCVA declined after 1 year of follow up in combined surgery group was 1.9 and 2.7 in cataract surgery alone group which was statistically significant.
- The surgery success was complete in 80.0% of the combined surgery group and 60% of the cataract alone group.
- In combined surgery group, hypotony was the main complication in 13.3% of the patients followed by bleb leak, Choroidal detachment , PCR , and shallow AC. In cataract surgery alone group, about 13.3% of the patients had PCR followed by choroidal detachment , hyphema, Iritis, shallow AC and hypotony.

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