

A Clinical Study of Efficacy of Intracameral Phenocaine in Phacoemulsification Cataract Surgery

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Abstract

Background: Cataract is the biggest cause of curable blindness in India & worldwide. Cataract extraction is the most effective surgical intervention in terms of quality of life restored. Phacoemulsification has led to substantial decrease in duration of surgery, postoperative course and duration of hospitalization. However obtaining adequate, quick, stable mydriasis and anaesthesia is one of the key points influencing the safety of surgery and patients comfort. Mydriatic eyedrops is the standard method for pupil dilatation. An alternative to the traditional preparation for cataract surgery is a complex drug containing mydriatics and analgesics: Phenocaine plus (entod pharma) mixture of 0.2 mg tropicamide, 0.31mg phenylephrine, and 10 mg lidocaine. The present study is undertaken to study efficacy of intracameral mydriasis by phenocaine plus in phacoemulsification cataract surgery. **Materials and Methods:** Single centre, prospective observational study was done over a period of 18 months between 1st March 2021 to 31st August 2022. 200 patients underwent phacoemulsification under intracameral phenocaine plus were prospectively evaluated for grade of mydriasis, pain outcome, clinical outcome and also patients and surgeon satisfaction through questionnaire. Patients with History of previous ocular co morbidities, injury or surgery, who are unable to understand pain scale, Traumatic cataract, congenital cataract, complicated cataract, Patients with Pxf (pseudo exfoliation syndrome) were excluded from the study. **Results:** Out of 200 patients 75% of the patients had no unwanted ocular movement whereas in 25% surgeon had some difficulty due to ocular movements. 83.5% of patients achieved excellent mydriasis (> 6 mm), maintained during the course of phacoemulsification surgery without the need of additional mydriatics and anaesthesia. **Conclusion:** The Intracameral solution of phenocaine plus solution containing 0.2 mg tropicamide, 0.31 mg phenylephrine, and 10mg lidocaine can be effectively used in patients with reduced preparation time, allowing a complete mydriasis management along with ocular analgesia. Intra-op pain score, need for supplemental anaesthesia and surgeons experience was better.

Keywords: Phacoemulsification, intracameral mydriatics, phenocaine plus, pupil dilatation

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Introduction

Cataract surgery with artificial intraocular lens (IOL) implantation is one of the most common surgical procedures around the world. The most popular type of surgery is microincision phacoemulsification. One of the risk factors for complications intraoperatively is insufficient pupil dilation [1, 2]. An adequate pupil dilatation facilitates surgical manoeuvres and stable mydriasis mitigates intraoperative complications. Despite adequate preoperative dilation, pupil can constrict unpredictably during surgery as a result of inadvertent instrument contact with the iris, prolonged surgery, surgical microscope illumination. Intraoperative miosis during cataract surgery can jeopardize the quality of IOL implantation which can cause complications, including iris trauma and posterior capsule rupture with or without vitreous loss [3]. The standard topical regimen (ie, multiple drops of mydriatics and anaesthetics) presents several disadvantages. Topical drops need to be instilled repeatedly prior to surgery to ensure adequate intraoperative mydriasis, which is time consuming, ocular surface toxicity and even cardiovascular side effects [4]. An alternative to the traditional preparation for cataract surgery is a complex drug containing mydriatics and analgesics: Phenocaine plus (Entod pharma) mixture of 0.2 mg tropicamide, 0.31 mg phenylephrine, and 10 mg lidocaine. The present study is undertaken to study the efficacy of intracameral mydriasis by phenocaine plus in phacoemulsification cataract surgery.

Materials and Methods

Study setting Department of Ophthalmology, Basaveshwara Teaching and General Hospital, attached to Mahadevappa Rampure Medical College, Kalaburagi. Institutional ethical committee clearance was obtained for the conduct of the study and informed consent was taken from all the patients. Patients attending Ophthalmology OPD for cataract surgery or routine examination with complaints of diminished vision were further evaluated. A Total of 200 patients were selected for the study. Study was conducted between 1st March 2021 to 31st August 2022 (18 months). All patients were also examined with dilated pupils before surgery, to assess the amount of pupillary dilation (using surgical caliper) and to evaluate nucleus grade and posterior segment. Patients in whom the pupil dilated with topical drops during clinic examination were only included. Pre-operative preparation would be instillation of topical antibiotic ofloxacin. During surgery, grade of mydriasis noted using callipers (Excellent (>6mm), good, poor). The 6-mm cut-off value was adopted because the Lens Opacities Classification System III (LOCS III) scale, which is used to assess cataract maturity, requires that the pupils are dilated to a diameter ≥ 6 mm. Difficulty due to ocular movements (No difficulty, some difficulty, and great difficulty)

Study Design: Prospective Observational Study.

Study Duration: 1st March 2021 to 31st August 2022 (18 months).

Sample Size: 200

Sampling Procedure: Simple random sampling

Inclusion Criteria : Pre Senile cataract and Senile cataract

Exclusion Criteria

1. History of previous ocular co morbidities, injury or surgery.
2. Patient who are unable to understand pain scale.
3. Traumatic cataract, congenital cataract, complicated cataract
4. Patients with Pxf (pseudo exfoliation syndrome)

Statistical data was analysed by IBM SPSS 2.0 version software. Correlation (Pearson) tests were applied for statistical significance. If p-value was less than 0.01 considered as significant.

Preliminary Examination

All the patients were admitted the day prior to the surgery. Detailed history was taken. General physical and systemic examination including cardiovascular system and respiratory system

examination, blood pressure recording was done. Preoperative Preparation All patients were put on topical antibiotic ofloxacin eye drops hourly one day prior to surgery. All anti-hypertensive and anti-diabetic medications for patients who were on treatment were continued.

Administration of Topical Anaesthesia with Intracameral Phenocaine

Patient position: Supine

Skin preparation: 5% povidone-iodine solution was used to paint the periorbital skin of the patient, after instillation of 0.5% proparacaine drops into the eye.

Technique: 1 drop of proparacaine hydrochloride 0.5% was instilled 4 times at an interval of 5mins before the start of surgery. The patient was shifted on the operating table. The lids and periocular area were painted with povidone iodine 5% solution and the patient draped. The eye speculum was inserted and then proparacaine drops put again on the exposed ocular surface and patient was advised to look towards the operating microscope light and the surgery was started. No superior rectus bridle suture was put. 0.2ml of preservative free injection phenocaine plus (tropicamide 0.2 mg + phenylephrine 3.1 mg+ lidocaine hydrochloride 10 mg) was injected after making entry into anterior chamber during surgery. Grade of mydriasis noted with the help of callipers.. All surgeries were done by single surgeon. Patients with severe pain or excessive unwanted ocular movements were considered for supplemental anaesthesia. Supplementary anaesthesia was defined as: extra topical drops, subconjunctival, sub-tenon's or peribulbar injections, or additional intravenous sedation. Postoperatively all patients received a course of topical antibiotic and steroid eye drops hourly. Systemic antibiotic and analgesics were prescribed for three days. ♣ Grade of mydriasis achieved intraoperatively (Excellent, good, poor).

Results

Table 1: Mydriasis Achieved Intra-Op in the Respondents N=200

Response	No. of Respondents	Respondents in %
Excellent	167	83.50
Good	33	16.50
Poor	00	00.00
Total	200	100.00

The above table examines about Mydriasis Achieved Intra Operatively. Out of the total respondents, 167(i.e. 83.5%) achieved Excellent (>6 mm) mydriasis, 33(i.e.16.5%) of the respondents had Good mydriasis and none of the respondents had poor mydriasis. The study interpreted that maximum number of the respondents achieved excellent Mydriasis Intra-Op. The statistical analyses were resulted with the Mean of 1.1650, Standard deviation was 0.372110 the range between the variable was 01 the variance was 0.138 and the Skewness 1.819.

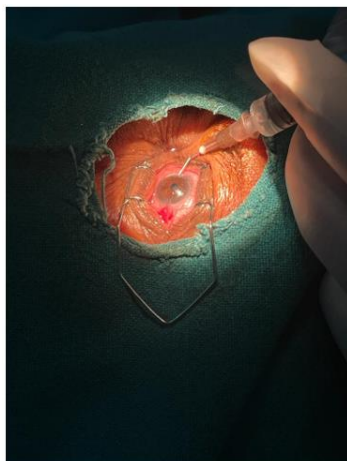


Figure 1: Intra operative injection of the drug into anterior chamber through side port.

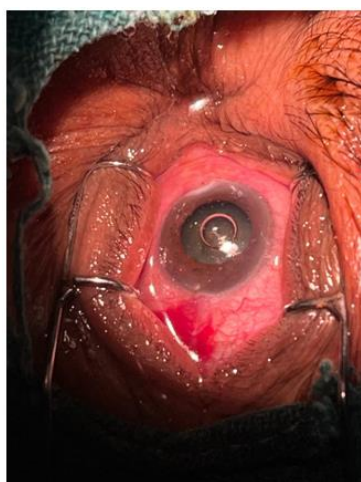


Figure 2: Mydriasis achieved intra operatively (immediately after the injection of the drug)

Discussion

Adequate pupillary dilatation and maintenance of mydriasis is of utmost important for any cataract surgery. Currently, the most prevalent method for achieving mydriasis for surgery is repeated administration of mydriatic and NSAID eye drops topically preoperatively. But it requires additional manpower and human error can lead to inadequate dilatation or dilatation of the wrong eye. To obviate these disadvantages, intraoperative intracameral mydriatic solutions were introduced. In our present study total 200 patients underwent phacoemulsification under intracameral phenocaine, of which 101 were female and 99 were male. Study observed that, maximum number of patients 120 (60%) belongs to the age group of 60-70 years, followed by 46 (23%) of patients belongs to the age group of 51-60 years, 27 (13.5%) of patients belongs to the age group of 70-80 years, 03 (1.50%) of patients belongs to the age group of 80-90 years, 02 (1.00%) of patients belongs to the age group of 90-100 years and 02 (1.00%) of patients belongs to the age group of ≤ 50 years showed no significance. In a study conducted by Keçik D et al., [5] out of 307 patients, majority of patients who underwent surgery were female (71.7%, $n = 220$), and the mean age of the total population was 73.8 – 8.7 years. The median age was 74 years (range, 40-99 years). Nazim-Lipski G et al., 2020, in their study showed No significant differences between two studied groups in terms of age, sex, cataract stage and associated systemic diseases were noted [6]. Our study observes that, out of 200 patients, operated eye in 112 (56%) patients was right and in 88(44%) patients operated side was left. Among 200 cases in present study, no additional anaesthetic was given in any

case as compared to additional anaesthetic given in 0.4% cases in study conducted by Labetoulle M et al. [7]. In our study surgeon scoring was done immediately after the surgery, Out of the total respondents, 141(70.5%) of the respondents Co-Operation was Excellent, 56 (28%) of the respondents Co-Operation was good and 03(1.5%) of the respondents Co-operation was poor. Patients co-operation can be improved by surgeon-patient communication and assuring the patient which reduces patients anxiety at any time during surgery.

Our present interpreted that 167(83.5%) of the respondents achieved Excellent (>6 mm) mydriasis throughout the surgery, 33(16.5%) of the respondents had Good mydriasis and none of the respondent had poor mydriasis with a mean of 1.1650 and standard deviation of 0.372110. In a study conducted by Raffaele Nuzzi et al. [8], 99.2% of patients receiving the intracameral formulation achieved acceptable mydriasis (>6 mm), maintained during capsulorhexis, phacoemulsification and IOL insertion without the need of additional mydriatics.

Conclusion

Communicative, calm, cooperative and well informed patients are candidates for intracameral anaesthesia. Intraoperative mydriasis management can lead to improvement in the whole operative setting, and a reduced preoperative instillation of mydriatics provides a lesser stressful experience for the patients. Intra-op complications between were minimal. The presence of lidocaine 1% in phenocaine plus led to improved intraoperative anaesthesia with lower patient discomfort during IOL insertion. Need for supplemental anaesthesia not required. Surgeons experience was significantly better with intracameral mydriatics. Therefore, intracameral mydriatics can be a better alternative to topical mydriatics alone for phacoemulsification provided there is careful patient selection and an experienced operating surgeon.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Artzen D, Lundstrom M, Behndig A, Stenevi U, Lydahl E, Montan P. Capsule complication during cataract surgery: casecontrol study of preoperative and intraoperative risk factors: Swedish Capsule Rupture Study Group report
2. J Cataract Refract Surg. 2009;35(10):1688-1693. 2. Vasavada A, Singh R. Phacoemulsification in eyes with a small pupil. J Cataract Refract Surg. 2000;26(8):1210-1218.
3. Liou SW, Yang CY. The effect of intracameral adrenaline infusion on pupil size, pulse rate, and blood pressure during phacoemulsification. J Ocul Pharmacol Ther. 1998;14(4):357-361.
4. Fraunfelder FT, Scafidi AF. Possible adverse effects from topical ocular 10% phenylephrine. Am J Ophthalmol. 1978;85(4):447-53.
5. Keçik D, Grabska-Liberek I, Jurowski P, MrukwaKominek E, Omulecki W, Romanowska-Dixon B, et al. Stable Mydriasis After Intracameral Injection of a Combination of Mydriatics and Anesthetic During Cataract Surgery: A Real-Life, Multicenter Study. J Ocul Pharmacol Ther. 2020 Dec;36(10):740-746. DOI: 10.1089/jop.2020.0001. Epub 2020 Nov 4. PMID: 33179989; PMCID: PMC7757547.
6. Nazim-Lipski G, Bolsega-Pacud J, Kubicka-Trzaska A, Markiewicz A, Romanowska-Dixon B. Mydrane intracameral injection site can be an alternative to mydriatic drops

- instillation in cataract surgery. *J Physiol Pharmacol.* 2020 Apr;71(2). DOI: 10.26402/jpp.2020.2.08. Epub 2020 Jul 2. PMID: 32633242.
7. Labetoulle M, Findl O, Malecaze F, et al. Evaluation of the efficacy and safety of a standardised intracameral combination of mydriatics and anaesthetics for cataract surgery. *Br J Ophthalmol.* 2016;100(7):976-85.
 8. Raffaele Nuzzi, Valentina Baratozzi, Maria Sole Polito, Federico Tridico. Efficacy and Safety of an Intracameral Combination of Two Mydriatics and an Anesthetic for Phacoemulsification in Complicated Patients. *The Open Ophthalmology Journal.* 2018;12(1):322-329.