Original Article

Effect of Different Anaesthesias in Phacoemulsification

Comparison of Pain in Patients with Topical Anaesthesia Alone Versus Topical Anaesthesia with Intracameral Lidocaine for Phacoemulsification

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ABSTRACT

Objective: To compare pain in patients undergoing phacoemulsification with topical anaesthesia alone versus topical anaesthesia with intracameral lidocaine.

Study Design: Randomized controlled trials study.

Place and Duration of Study: This study was conducted at the Department of Ophthalmology, University Medical & Dental College, Faisalabad, from May 2016 to December 2016.

Materials and Methods: It was conducted on patients undergoing phacoemulsification. One hundred and twenty patients were selected in accordance with the inclusion and exclusion criteria. They were divided into two equal groups, group A patients were operated under topical anaesthesia alone while those of Group – B were operated under a combination of topical anaesthesia and intracameral preservative free lidocaine. Visual Analog Scale was used for pain assessment. Data was analyzed using computer software SPSS version 21.0. Mean and standard deviation were calculated for quantitative variables like age and pain. Frequency and percentages were calculated for qualitative variable i.e. gender of the patients. Chi-square test was applied for comparison and a P-Value ≤0.05 was considered as significant.

Results: A total of one hundred and twenty patients were selected. Out of them 50.8% were male and 49.2% were female. They were divided into two equal groups A and B, group A patients were operated under topical anaesthesia alone while group B were operated under topical anaesthesia along with intracameral Lidocain. Group A and group B had a mean age of 54.55 ± 8.75 and 56.00 ± 9.01 years respectively. Eightpatients of group A had pain comparedto only 2 patients of group B. This difference is statistically significant with theP value of 0.041.

Conclusion: A significant reduction was observed in pain score of patients operated under topical anesthesia with intracameral lidocaine for phacoemulsification as compared to topical anesthesia alone.

Key Words: Pain Score, Topical Anesthesia, Phacoemulsification, Intracameral Lidocaine.

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INTRODUCTION

Loss of transparency of natural lens is termed as Cataract. Though it is mostly age-related, but cataract can appear in young age group due to ocular inflammation, trauma, several drugs and congenital problems[1]. Loss of transparency causes gradual loss of vision, ultimately leading to blindness. 30% of UK population, aging 65 years or more, are suffering from cataract of one or both eyes and about 10% of this age group have already undergone cataract surgery.

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The prevalence of cataract is in direct relation with age[2]. Surgery is the only recognized treatment of cataract. Phacoemulsification was the preferred surgical method for treating cataract in 77% of patients in UK from 1997 to 1998[3]. Phacoemulsification is a safe and cost effective method compared to conventional extra capsular cataract surgery[4]. Now, more than 99% of cataract patients are treated with phacoemulsificationin UK[5].

The gradual replacement of conventional extra capsular cataract surgery with phacoemulsification technique for treating cataract surgery has altered the anesthesia requirements. Good analgesia and a stress free procedure are the ultimate goals of an ideal anesthesia. Topical, intracameral, subconjunctival, sub-Tenon, peribulbar and retrobulbar anesthesia are the various techniques used for achieving local anaesthesia in cataract surgery[6]. Retrobulbar hemorrhage, globe penetration, extraocular muscle injury, optic nerve trauma andbrainstem anesthesiaare the complications associated with traditional peribulbar and retrobulbar

injections. These complicationscan be easily avoided using topical and intracameral local anesthesia making them popular, safe and effective anesthetic modalities in cataract surgery[7]. Topical anesthesia has advantages of being cost effective and non-invasive with least complications and better rehabilitation. Topical anesthesia, introduced first by Fichman in 1992, is widely accepted and used (61%)modality of anesthesia among US surgeons in cataract surgery[8]. Increased patient cooperation and reduced level of discomfort was shown in the adjuvant use of topical anesthesia with intracameral lidocaine 1% compared to topical anesthesia alone in a study conducted by Crandall et al.[9]. Early onset and intermediate span of lidocaine proves it's suitability for cataract surgery[10]. Pupil dilateup to 4.39±0.53 mm by intracameral injection of lidocaine during phacoemulsification making the compulsory use of mydriatics unnecessary[11]. Javed EA[12] conducted a study using Visual Analog Scale (VAS)for assessing pain during phacoemulsification and found that a combination of topical and intracameral anesthesia has a superior analgesic property compared to the only use of topical anesthesia. The introduction of small-incision phacoemulsification has revolutionized cataract surgery minimizing the requirement of total akinesia of globe for safe surgery[13]. Thus, the use of GA (general anesthesia) and techniques of local anesthesia leading to akinesia are no longer required. This study was done to provide basic literature comparing pain in patients with topical anesthesia alone versus topical anesthesia with intracameral lidocaine for phacoemulsification and to help surgeons in choosing the best available method in order to minimize discomfort and pain to patient.

MATERIALS AND METHODS

After the ethical committee approval for this study, a total number ofone hundred and twenty (120) patients were selected fulfilling the inclusion/exclusion criteria from the Department of Ophthalmology, University Medical & Dental College, Faisalabad. Patients were randomly divided into two equal groups using lottery method after taking informed consent. The calculated sample size is 120 cases (60 in each group), 80% power of study, taking expected percentage of 11.11% in topical alone versus 0% in topical anaesthesia with subconjunctival infiltration of 2% lignocaine for Phacoemulsification with 5% level of satisfaction. Group – A patients were operated under topical anaesthesia alone while those of Group – B were operated under a combination of topical anaesthesia and intracameral preservative free lidocaine. All the patients were operated by one doctor and observations were recorded using Visual Analog Scale on a pre-designed form. An unpleasant sensory and emotional experience which arises from actual or potential tissue damage was regarded as pain. Pain or no pain conditions were decided according topain score measured using Visual Analog Scale. A score of 0 to 3 was considered as no pain and a score of 4 to 10 was considered as pain. Patients with known history of hearing impairment, poor native language skills, mental sickness, nystagmus, involuntary movement disorder, intraoperative complications such as capsular rupture or vitreous loss were excluded from our study. Data was analyzed using SPSS version 14.0. Mean and standard deviation were calculated for quantitative variables like age and pain. Frequency and percentages were calculated for qualitative variable i.e. gender of the patients. Chi-square test was applied for comparison and a P-Value ≤ 0.05 was considered as significant.

RESULTS

A total number of one hundred and twenty (120) patients divided into two equal groups A and B, 60 patients of group A operated with topical anaesthesia alone and other 60 of group B operated under topical anaesthesia along with intracameral Lidocain. Out of 120 patients 60 patients of group A have mean age of 54.55 ± 8.75 and group 60 patients of group B have mean age of 56.00 ± 9.01 Table-2. As regard to gender of patients out of 120 patients 61 (50.8%) were male and 59 (49.2%) were female Tale 1.

Table No.1: Frequency and percentages of gender and pain

Characteristics	Frequency	Percentage (%)
Gender		
Male	61	50.8
Female	59	49.2
Frequency of Pain		
No pain	110	91.7
Pain	10	8.3

Table No. 2: Mean age and pain score

Characteristics	Group A n=60	Group B n=60
Age	54.55 ± 8.75	56.0 ± 9.01
Pain Score	2.67 ± 2.03	2.07 ± 1.00

Table No.3: Frequency of pain in both groups

Groups	Pain		P value
	No pain	Pain	
Topical anesthesia alone	**52**	**8**	0.04
Topical anesthesia with intracameral Lidocain	**58**	**2**	
Total	**110**	**10**	

As regard to the pain score patients in group A have mean pain score of 2.67 ± 2.03. Similarly in group B have mean pain score of 2.07 ± 1.00 Table-2. Similarly as regard to the pain out of 120 patients 110 (91.7%)

have no pain and 10 (8.3%) patients have pain Table-1. According to the groups, out of 60 patients in the group A (operated with topical anaesthesia alone) 52 patients have no pain and 8 have pain. Similarly in group B (operated under topical anaesthesia along with intracameral Lidocain) out of 60 patients 58 were have no pain and 2 patients were have pain, the resulted P value is P=0.041 (Table-3).

DISCUSSION

The efficacy of topical anesthesia for phacoemulsification is widely accepted and proven from several studies[14,15] making it a popular technique among cataract surgeons. Improved operating conditions (like optimum wound access) can be achieved by preserved ocular motility in topical anesthesia. Regional anesthesia techniques can lead to globe perforation, alteration of vitreous pressure and change in optic nerve blood flow. All of these sight threatening or even life threatening complications can be avoided by using topical anesthesia. Moreover, quicker postoperative recovery and reduced intensity of postoperative pain also make this technique preferable to both patient and doctor[16]. However, topical anesthesia alone may not be able to prevent pain produced by the movement of iris-lens diaphragm in some individuals.

Impulses from pain fibers exiting the eye (including the impulses coming to ciliary ganglion from ciliary body, iris and cornea) must be fully blocked in order to achieve complete analgesia in intraocular surgery. Topical anesthesia alone usually fails to block these nerves completely leading to considerable uncomforting on intraoperative manipulation of the iris. Several techniques have been proposed to minimize and relieve this discomfort associated. Importance of adequate cycloplegia was advocated by Grabowin order to minimize the stretching of zonules and ciliary muscle. Role of hydrostatic pressure created by irrigation solution in causation of pain was explained by Novak and Koch[17]. Pandey et al.[18] narrated various techniques to minimize pain including the gradual increase of microscopic luminance, minimal iris manipulation and low phacopower usage.

The intracameral xylocaine technique, first described by Gills et al[19]**,** was devised to overpower these difficulties. It uses 0.5ml of unpreserved xylocaine 1%, which is injected in the anterior chamber at the start of surgery. Efficacy, safety and dosage regimens of this techniques are accessed by various studies[20].

A significant efficacy of intracameral block was seen in operations requiring intraoperative manipulation of intra ocular structures. Patients receiving only topical anesthesia were more prone to suffer from considerable discomfort on iris manipulation, zonular stretching and spasm of the ciliary body. In our study, a total of 120 patients were included. As for as gender distribution is concerned, 50.8% of them were male and 49.2% were female. They were divided into two equal groups A and B, group A patients were operated under topical anaesthesia alone while group B were operated under topical anaesthesia along with intracameral Lidocain. Group A had a mean age of 54.55 with Standard Deviation of 8.75 compared to group B with mean age of 56.00 and Standard Deviation of 9.01. Out of 60 patients of the group A, only 8 had pain. Similarly, out of 60 patients of group B only 2 patients were having pain. These findings are statistically significant with the p value of 0.041 proving the superiority of topical anesthesia with intra cameral lidocaine compared to topical anesthesia alone.

Our finding are in total contrast with the results of a study conducted by Crandall et al, narrating no considerable difference of intraoperative pain scores, between patients receiving topical anesthesia alone or those receiving a combination of topical anaesthesia and intracameral lidocaine. Our results are in accordance with the findings of Pandey et al[18] and Gills et al[19] Koch et al[20]. All of these studies have reported alleviation of discomfort and pain on irrigation of the anterior chamber with unpreserved xylocaine in patients undergoing phacoemulsification under topical anesthesia. Surgical difficulties can arise from poor patient compliance and eye mobility demanding a certain level of surgical expertise[21,22].

A considerable reduction of tissue manipulation and time consumption can be achieved by commonly used suture less clear corneal incision techniques[23]. Since its introduction, topical anaesthesia has gained immense popularity owing to significant reduction of potentially serious complications associated with retrobulbar and peribulbar Anesthesia. Absence of akinesia is the main disadvantage of topical anaesthesia. To achieve the desired level of akinesia, patients in our study were instructed to fix their gaze at the light of the operating microscope. Light intensity of the microscope was gradually increased from the lowest possible level to normal value at the beginning of capsulorhexis in order to counteract photophobia. Most of the manipulation of iris are done during hydrodissection phacoe-mulsification, lens aspiration and intraocular lens insertion. Thus, A higher pain scores during surgery was demonstrated in their manipulation under topical anesthesia by a study performed by O'Brien[24].

CONCLUSION

A significant reduction was observed in pain score of patients operated under topical anesthesia with intracameral lidocaine for phacoemulsification as compared to topical anesthesia alone.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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