ORIGINAL ARTICLE

COMPARISON OF MEAN POSTOPERATIVE PAIN BETWEEN TOPICAL ANAESTHESIA AND RETROBULBAR ANAESTHESIA IN PATIENTS WITH PHACOEMULSIFICATION PROCEDURE FOR CATARACT SURGERY

Ahad Sharif[1], Ayyaz Hussain Awan[2], Sufian Ali Khan[1], Mutahir Shah[1], Saif Ullah[3], Adila Anwar[1]

[1]Department of Ophthalmology KRL Hospital Islamabad-Pakistan, [2]Akhtar Saeed Medical College, Bahria Enclave, Islamabad-Pakistan
[3]PIO Al-Shifa Trust Eye Hospital, Rawalpindi-Pakistan

Background: The purpose of the study was to compare the mean post-operative pain in patients undergoing phacoemulsification for cataract with topical anaesthesia vs. retrobulbar anaesthesia. **Methods:** An interventional study was carried out in a tertiary care hospital of Islamabad. The study duration was from 30th March 2021 to 29th September 2021. The adopted sampling technique was consecutive sampling. The sample size was 180 subjects divided into two groups of 90 each. Through the use of a lottery, patients were split into two groups of 90 each. Patients in group A received topical anaesthesia, whereas individuals in group B received retrobulbar anaesthesia. An Ophthalmologist performed a retrobulbar block on Group B using a 23-gauge needle and 5 mL of 2% Lidocaine. The researcher observes the patients for post-operative pain. SPSS 25 version was used for statistical analysis. **Results:** The research study included 180 patients in total. Participants ranged in age from 40 to 70, with a mean age of 56.26±6.31 years, and 46% male vs. 54 % females. The study found the post-operative pain at 45 minutes after topical anaesthesia was 0.60±0.67 and after retrobulbar anaesthesia was 1.40±0.90 in patients undergoing phacoemulsification for cataract surgery. The results showed that Group A feel less pain compare to Group B and the significance value was (*p* .0001). **Conclusion:** The study concluded that topical anaesthesia is usually a best alternative for retrobulbar anaesthesia. The patient feel less pain with topical compared to retrobulbar anaesthesia.

Keywords: Cataract; Phacoemulsification; Retrobulbar Anaesthesia; Topical Anaesthesia

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INTRODUCTION

Cataracts, or loss of lens transparency owing to lens opacification, are one cause of avoidable visual impairment. Across the globe, a total of 2.2 billion estimated people were suffer from vision impairment.[1] Cataracts caused by aging are a leading cause of preventable blindness in both developed and underdeveloped regions. It is estimated that between 1 and 2 million people go blind every year because of cataracts.[2–4] Cataract-related blindness affects about 20 million people, the vast majority of whom are located in developing countries.[5] Age-related cataracts, the most common type in adults, often emerge between the ages of 45 and 50 but can occur at any time in life. Cataract prevalence is known to grow with age, from 3–9% in those 55–64 years old to as high as 92–96% in those 80 years and beyond, according to certain research.[6]

A procedure called phacoemulsification to treat cataracts is a frequent ophthalmic surgical procedure.[7] Cataract surgery is performed by ophthalmologists more to enhance quality of life due to improved eyesight than to treat blindness.[8] Phacoemulsification has become the standard method of minimally invasive procedures in the last two decades. Phacoemulsification is the preferred choice across the globe mostly in urban settings but also entering to the rural settings as well.[9] Local anaesthesia, such as retrobulbar or peribulbar injections of local anaesthetics, can now be used instead of general anaesthesia during cataract surgery thanks to advances in corneal and limbal incisions, lens nucleus phacoemulsification, and flexible intraocular lens implantation.[10,11]

With the development of graded, self-sealing corneal incisions, surgeons can now use Sub-Tenon and topical anaesthetic with minimal risk to the patient.[12] Cataract surgery has made use of retrobulbar injection (RBA) of anaesthetic drugs for over a century. The "blind" insertion of a needle into the retrobulbar space has never occurred without severe

sight- and life-threatening difficulties, despite several modifications created over the decades to lessen the possible hazards of harming infraorbital structures.[13] Fichman originally proposed the use of topical anaesthesia (TA) as a preferable option to injecting local anaesthetic drugs, with the added benefits of quicker visual recovery and high patient satisfaction. Easy administration, no or minimal discomfort, quick start of anaesthetic effect, and, perhaps most importantly, the absence of hazards associated with retrobulbar injections are all benefits of topical anaesthetics.[14]

In Pakistan, topical anaesthetics have not been especially well-liked. Yet as clear corneal phacoemulsification surgeries become more common, the time has come to switch to topical anaesthesia, which is secure, quick, affordable, and preferred by both patients and doctors. This research aims to find out the feasibility of the said procedure.

The objectives of the study were to compare the mean post-operative pain in phacoemulsification patients undergoing retrobulbar versus topical anaesthesia during cataract surgery.

MATERIAL AND METHODS

In the ophthalmology department of a Tertiary Care Hospital in Islamabad, an interventional study was conducted. Non-probability consecutive sampling was chosen as the sampling technique. 180 patients in total were included in the study using the WHO calculator, which had an 80% power and a 95% confidence interval. The study duration was from 30th March 2021 to 29th September 2021. Patients having age of 40–70 years and both genders were included going through phacoemulsification surgery. Traumatic cases, history of previous surgery corneal abnormality and postsurgical complication patients were excluded. The study was conducted after taking approval from the Tertiary Care Hospital ERB committee. The patients or their legal representatives gave their informed consent. The study committed to the Helsinki Declaration at all stages. Through the use of a lottery, patients were split into two groups of 90 each. Patients in group A received topical anaesthesia, whereas individuals in group B received retrobulbar anaesthesia. An ophthalmologist performed a retrobulbar block on Group B using a 23-gauge needle and 5 mL of 2% lidocaine. All patients were observed by the researcher, who recorded post-operative pain on a visual analogue scale with 0 representing no pain and 10 representing the worst pain at 45 minutes after surgery.

SPSS 25 was used to enter and evaluate the data. For quantitative variables including age, duration of surgery, and post-operative pain score, the mean and standard deviation were calculated. The independent sample "t" test was used to compare the mean post-operative pain levels between the two groups. *p*-values less than 0.05 were considered significant.

RESULTS

The researchers studied 180 patients in total. Participants ranged in age from 40 to 70, with a mean age of 56.26±6.31 years. (Table-1). Out of 180 patients 84 (46.0%) were males and 96 (54.0%) were females (Figure-1). The study found the post-operative pain at 45 minutes after topical anaesthesia was 0.60±0.67 and after retrobulbar anaesthesia was 1.40±0.90 in patients undergoing phacoemulsification for cataract surgery. The results showed a very high significance among the two groups with a *p* value of (.0001) as shown in Table-2. This showed that those who got a topical anaesthesia felt a very less pain compares to those given a retrobulbar anaesthesia. Stratification of mean post-operative pain with respect to age and gender was done and the results showed that male feel more pain than females and those having age 40–55 years feel more pain in both of the groups compared. (Table-3). Table-4 of the results showed that the intensity of feeling pain was more in illiterate and postgraduate however the retrobulbar was more painful in all patients with a high statistical result.

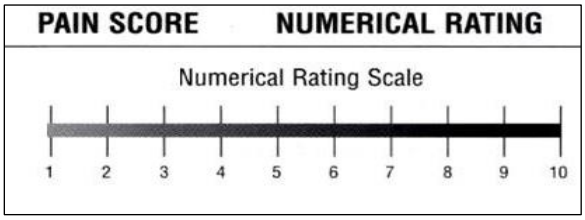

Figure-1: Visual Analogue Scale for pain measurement postoperatively

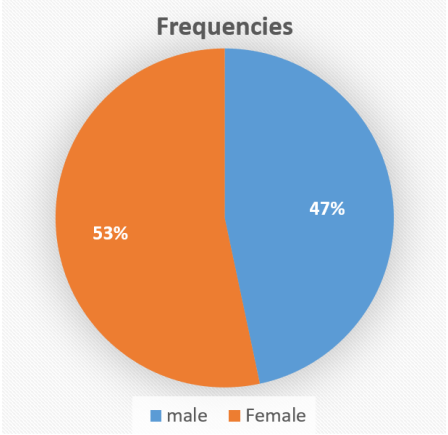

Figure 2: Frequency wise distributions of the Participants

Table-1: Age distribution between the two groups N=180

Age of the Particpents	A Group		B Group (n=90)		Total patients	
	No. of Pat	%	No. of the Pat.	% age	No. of the Pat	%
40–55	37	41.11	42	46.67	79	43.89
56–70	53	58.89	48	53.33	101	56.11
Mean±SD	56.76±6.69		56.23±5.79		56.26±6.31	

Table-2: Comparison of the mean postoperative pain in patients undergoing phacoemulsification for cataract surgery with topical versus retrobulbar anaesthesia.

	A Group N=90		B Group N=90		Level of Sig. (*p*-value)
	Mean value	SD	Mean value	SD	
post-operative pain	0.60	0.67	1.40	0.90	**0.0001**

Table-3: Distribution of mean postoperative pain by age and between-group differences

Age and Gender		A Group A Post Up Pain		B Group Post Up Pain		Level of Sig (*p*-value)
		Mean value	Stan Dev.	Mean value	Stan. Dev.	
40-55	Male	0.65	0.59	1.62	.94	**0.0001**
56-70	Female	0.57	0.72	1.21	0.82	**0.0001**

Table-4: Comparison of postoperative pain severity by educational level.

Education	A Group Post Up Pain		B Group Post Up Pain		Level of Sig. (*p*-value)
	Mean value	St. Dev.	Mean value	St. Dev.	
Illiterate	0.74	0.74	1.71	0.74	**0.0001**
Undergraduate	0.22	0.42	0.78	0.87	**0.0001**
Postgraduate	1.05	0.52	1.78	0.70	**0.0001**

DISCUSSION

The current study showed a comparative insight of the patients undergoing phacoemulsification. When gauging how much pain patients feel after receiving topical or retrobulbar anaesthesia, we found that topical anaesthesia was more effective as patients feel less pain than retrobulbar anaesthesia. A statistically significant difference between the groups was found. Because of the risks, peribulbar as well as retrobulbar anaesthesia have inspired researchers to look for substitutes.

The ideal anaesthetic would permit a painless operation with no regional or general adverse effects. It needs to be practical from a financial standpoint and easy on the nerves of both the physician and the patient during the operation. During cataract surgery in the prior decade, peribulbar anaesthesia (PA) was the gold standard. The use of shorter-acting anaesthetics is a direct outcome of the decreased time of cataract surgery made possible by advances such as the use of smaller and self-sealing incisions.[15]

We evaluated individuals who had undergone phacoemulsification for cataract surgery and compared the average post-operative pain experienced by those who had received topical vs retrobulbar anaesthesia. In our study, post-operative pain at 45 minutes after topical anaesthesia was 0.60±0.67 and after retrobulbar anaesthesia was 1.40±0.90 in patients undergoing phacoemulsification for cataract surgery (*p*-value =0.0001). A previously done study showed that, post-operative pain at 45 minutes after topical anaesthesia was 0.26±0.69 and after retrobulbar anaesthesia was 0.66±1.44 in patients undergoing phacoemulsification for cataract surgery.[16] Pain ratings were 0.84±1.30 in the group given topical anaesthetic and 0.73±1.50 in the group given retrobulbar anaesthesia, according to another study.[17] The findings were very close to those of our study. According to the available data, the mean standard deviation pain score for patients given topical anaesthetic was 1.13±1.36, while those given retrobulbar anaesthesia reported a score of 1.14±1.47. There was no statistically significant difference in the average levels of discomfort reported ($p = 0.92$).[18]The results of the study is not corresponding to our results.

It is both possible and desired to do cataract surgery with only topical anaesthetic, and this method has been found to be well tolerated. [20] Patient preference for topical anaesthesia appears to be much greater than for RBA and TA is justified as a means of improving safety without causing discomfort even in complicated cases of cataract surgery, as demonstrated in (Table II), which supports our study results.[16] Topical anaesthetic was favored by patients who had undergone a variety of anaesthetic procedures on each eye. Literature showed that there was no association or significance among education level of the patietns.[16] However our study results showed that (table IV) pain in group B is more compare to Group A in both illiterate and post graduate followed by group A. The probable reason for that will be less tolerability among

illiterate and higher sensitivity of the postgraduates. These finding showed a high statistical significance but contradictory to literature mentioned above. Topical anaesthetic for cataract surgery has grown in popularity in recent years as a safe and minimally invasive option. However, different data on postoperative pain, anxiety, discomfort, and patient satisfaction using Topical anaesthetic have been published showing a debatable result.[19,21]

CONCLUSION

This study concluded that mean post-operative pain after topical anaesthesia is less in patients undergoing phacoemulsification for cataract surgery as compared to retrobulbar anaesthesia. In light of the current study we recommend that topical anaesthesia should be used as a primary method in patients undergoing phacoemulsification for cataract surgery in order to prevent post-operative pain.

Conflict of interest: The authors have no conflict of interest with anyone /any party.

AUTHORS' CONTRIBUTION

AS: Conceptualization, data collection. AA: Proof reading, supervision during data collection, conceptualization. SAK: Proof reading, write-up. MS: Study design, data analysis. SU: Data interpretation. AA: Data collection.

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Address for Correspondence:

Mutahir Shah, Department of Ophthalmology KRL Hospital Islamabad-Pakistan
Cell: +92 316 561 0091
Email: mutahirshah122@yahoo.com