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Compare the efficacy of Analgesia in Subtenon and Peribulbar Anesthesia in phacoemulsification with an intraocular lens.

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ABSTRACT

Introduction

The provision of ophthalmic regional anesthesia varies worldwide. peribulbar techniques using sharp needles are still accepted and widely practiced. Since the first introduction of the peribulbar block in 1986 by Davis and Mandel, many modifications of the techniques are observed. -

Objective

To compare the efficacy of Analgesia in Subtenon and Peribulbar Anesthesia in phacoemulsification with an intraocular lens.

Study design

A randomized controlled trial.

Settings

Department of Ophthalmology, SIMS/ Services Hospital Lahore

Duration of study

November 01, 2018, to April 30, 2019

Materials and methods

A total of 140 eyes of 140 patients fulfilling the inclusion and exclusion criteria were taken in the study. In 70 eyes, phacoemulsification was performed under peribulbar anaesthesia, while the other 70 eyes received subtenon anesthesia. All patients underwent clear corneal phacoemulsification and implantation of an intraocular lens. Verbal pain score of 4 levels (0 = no pain, 1= mild pain, 2 = moderate pain which needs more analgesic, 3 = severe pain which is not tolerated and needs to stop the procedure) was used during and after surgery to assess each patient's overall severity of intraoperative pain.

Results

The data analysis showed that in group A that is subtenon anaesthesia, 63 (90.0%) patients experienced complete analgesia (pain score = Zero), 4 (6.0%) patients felt mild pain (pain score= 1), 3 (4.0%) patients felt moderate pain (pain score= 2), and none of our patients in this group experienced severe pain. In group B (peribulbar anesthesia) 54 (78.0%) had no pain (pain score = Zero), 12 (18.0%) patients had mild pain(pain score= 1), 4 (4.0%) patients experienced moderate pain (pain score=2) and none of our patients in this group experienced severe pain.

Efficacy of analgesia, in group A, the subtenon anaesthesia was 90.0% while in group B, peruibulbar anaesthesia it was 78.0%.

Conclusion

The subtenon anaesthesia is an effective, safe and excellent alternative to double site peribulbar anaesthesia in providing analgesia for cataract surgery.

Keywords

Subtenon, peribulbar, analgesia, phacoemulsification

INTRODUCTION

Cataract surgery is the most commonly performed intraocular surgery. Cataract surgery can be carried out under general or local anesthesia. Due to the unwanted effects of general anesthesia, local anesthesia is preferred by most surgeons and patients for cataract surgery; the latter having good analgesia and quick recovery. Cataract accounts for 50% of blindness globally and remains the leading cause of visual impairment in all regions of the world. Cataracts are not preventable, but surgical treatment is one of the most cost-effective interventions.[1]Age related cataract surgery is done under different forms of anaesthesia i.e. local anaesthesia with or without sedation, topical anaesthesia, and general anaesthesia, local anaesthesia is the commonest.[2] Different techniques have been used to administer the local anaesthesia like retrobulbar injection, peribulbar injection and sub tenon blockade.[3] Local anaesthesia involves the blockage of a nerve subserving a given part of the body by infiltration of the area around the nerve with a local anaesthetic.[4] The two main approaches in the eye are retrobulbar and peribulbar. There is debate over whether the peribulbar approach provides more effective and safer anaesthesia for cataract surgery than retrobulbar block.[5]Different techniques of local anaesthesia are popular but still, peribulbar anaesthesia is widely accepted and practiced.[6] Since the first introduction of peribulbar anesthesia in 1986, many modifications are observed in its technique. Peribulbar anaesthesia is achieved by the bulk spread of local anaesthesia. [7]The block is often established using a single or double injection technique. However, the choice between single or double injection techniques is based on the volume of the orbit, the degree of akinesia required, the experience of the ophthalmologist and the preference of the anesthesiologist.[8] For dual-injection technique; the most popular site for the first injection is inferotemporal and for the second injection is superomedial.[8]

Rare but serious complications are associated with blind needle insertion while giving the peribulbar anesthesia. These include globe perforation, brain stem anaesthesia, retrobulbar hemorrhage, optic nerve injury, post-operative strabismus, and intravascular injection, etc. These complications are inevitable even in experienced hands.[9] An adequate block can be

achieved with a single peribulbar injection placed either inferotemporal, or medial, and there is no evidence that a second primary injection decreases the rate of supplemental injection required. We also, therefore, propose that a second primary peribulbar injection is unnecessary and may carry an increased risk of globe perforation.[10]

As there is conflict in the results of the above-mentioned studies and also the first study has used a smaller sample size as compared to my study so this study will be more authentic and reliable. As cataract surgery is being performed on a large scale under local anaethesia, so this study will be helpful to find a better technique with lesser complications.[11]

Materials and methods

A total of 140 eyes of 140 patients fulfilling the inclusion and exclusion criteria were taken in the study. In 70 eyes, phacoemulsification was performed under peribulbar anaesthesia, while the other 70 eyes received subtenon anesthesia. All patients underwent clear corneal phacoemulsification and implantation of an intraocular lens. Verbal pain score of 4 levels (0 = no pain, 1= mild pain, 2 = moderate pain which needs more analgesic, 3 = severe pain which is not tolerated and needs to stop the procedure) was used during and immediately after surgery to assess each patient's overall severity of intraoperative pain.

RESULTS

A total of 140 patients included in this study according to the inclusion and exclusion criteria, and then they were randomized into two groups using a random number table. There were 70 patients (50%) in each group of our study that is To compare the efficacy of Analgesia in Subtenon and Peribulbar Anesthesia.

Demographic characteristics

The mean age of the patients was 56.36 with SD of ±5.91 Years and the age range was 45-65 years. There were 119 (29.8%) patients in the 45 to 50 years age group. About 42 (10.5%) patients were in 51 and 55 years age group, 176 (44.0 %) were in 56 to 60 years age group and 63(15.8 %). patients in 61-65 years age group(Table 1.1 and 1.2)

In the distribution of patients by sex, there were 71 (50.8%) male and 69 (49.3%) female patients (Table 2).

The data analysis showed that in group A that is subtenon anaesthesia, 63 (90.0%) patients experienced complete analgesia (pain score = Zero) and they experienced absolutely no pain during the procedure. 4 (6.0%) patients felt mild pain (pain score= 1) which was tolerable, 3 (4.0%) patients felt moderate pain (pain score= 2), and none of the patients in this group experienced severe pain which has a score of 3 in our grading of analgesia (Table 3).

In the 2nd group that is group B that is peruibulbar anaesthesia 55 (78.0%) patients did not feel any pain at all, that is pain score of zero, 13 (18.0%) patients expressed that they had mild pain during the procedure which was quite tolerable. In this group, 3 (4.0%) patients experienced moderate pain (pain score=2) and again in this group, none of the patients experienced severe pain (Table 3).

Translating the above-mentioned data of analgesia into the efficacy of analgesia, in group A, the subtenon anaesthesia was effective in 63 (90.0%) patients and only 7 (10.0%) patients showed failure or ineffective anaesthesia in this group. While in group B, in which the peruibulbar anaesthesia technique was used, only 55 (78.0%) showed complete effectiveness and in the rest of the 15 (22.0%) patients, this method of anesthesia did not prove effective (Table 4).

Table 1.1: Age Distribution of patients

(n=140)

Age (Years)	**Range**	45-65
	Mean± SD	56.36±5.91years

Figure 1.1:Age Distribution of patients

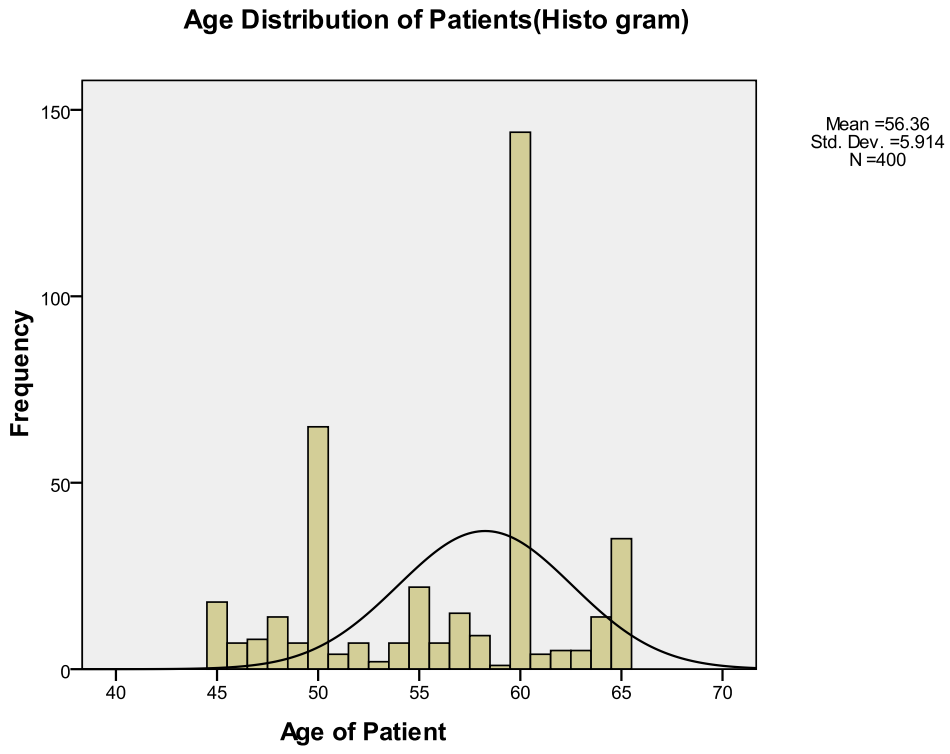


Table 1.2 Distribution of Patients in Different Age groups

Age Groups (years)	Number of Patients	Percent
45-50	42	29.8
51-55	15	10.5
56-60	61	44.0
61-65	22	15.8

Figure 1.2: Distribution of Patients in Different Age Groups

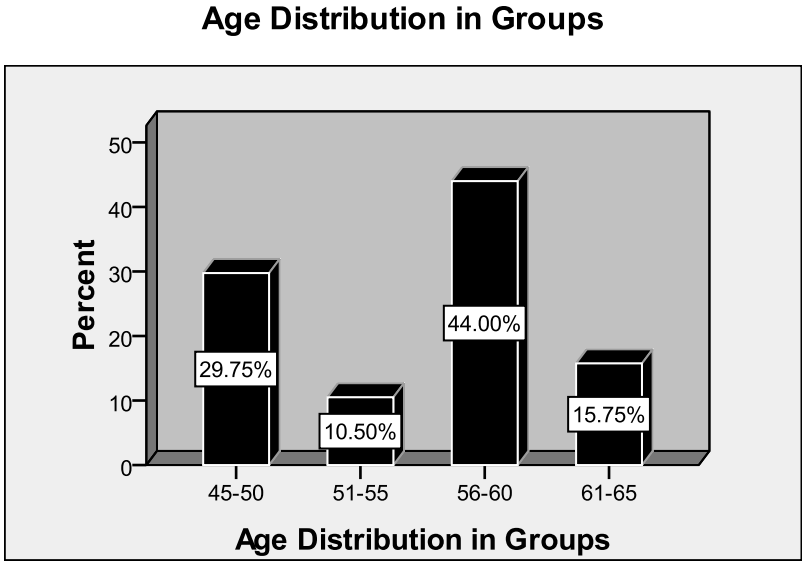


Table 2:Gender Distribution of Patients

Gender Distribution (n=140)	
Male	**Female**
71(50.8%)	69 (49.3%)

Figure 2:Gender Distribution of Patients

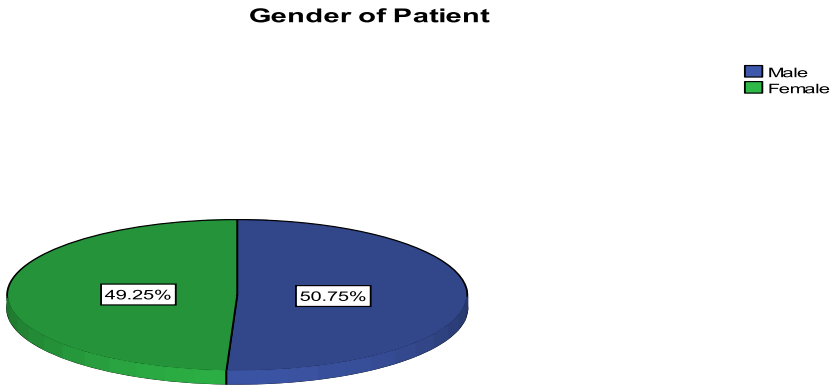


Table 3: Pain score in Patients with Single Site Versus Double Site Peribulbar Injection

Pain Score	Type of Anesthesia	
	A: Single Site	B: Double Site
No Pain (0)	63 (90.0%)	55 (78.0%)
Mild Pain (1)	4 (6.0%)	13 (18.0%)
Moderate Pain (2)	3 (4.0%)	3 (4.0%)
Total	70	70

Table 3: Pain score in Patients with Single Site Versus Double Site Peribulbar Injection

Pain Score	Type of Anesthesia	
	A: Single Site	B: Double Site
No Pain (0)	63 (90.0%)	55 (78.0%)
Mild Pain (1)	4 (6.0%)	13 (18.0%)
Moderate Pain (2)	3 (4.0%)	3 (4.0%)
Total	70	70

P=0.014

Figure 3: Pain score in Patients with Subtenon's Versus Peribulbar Injection

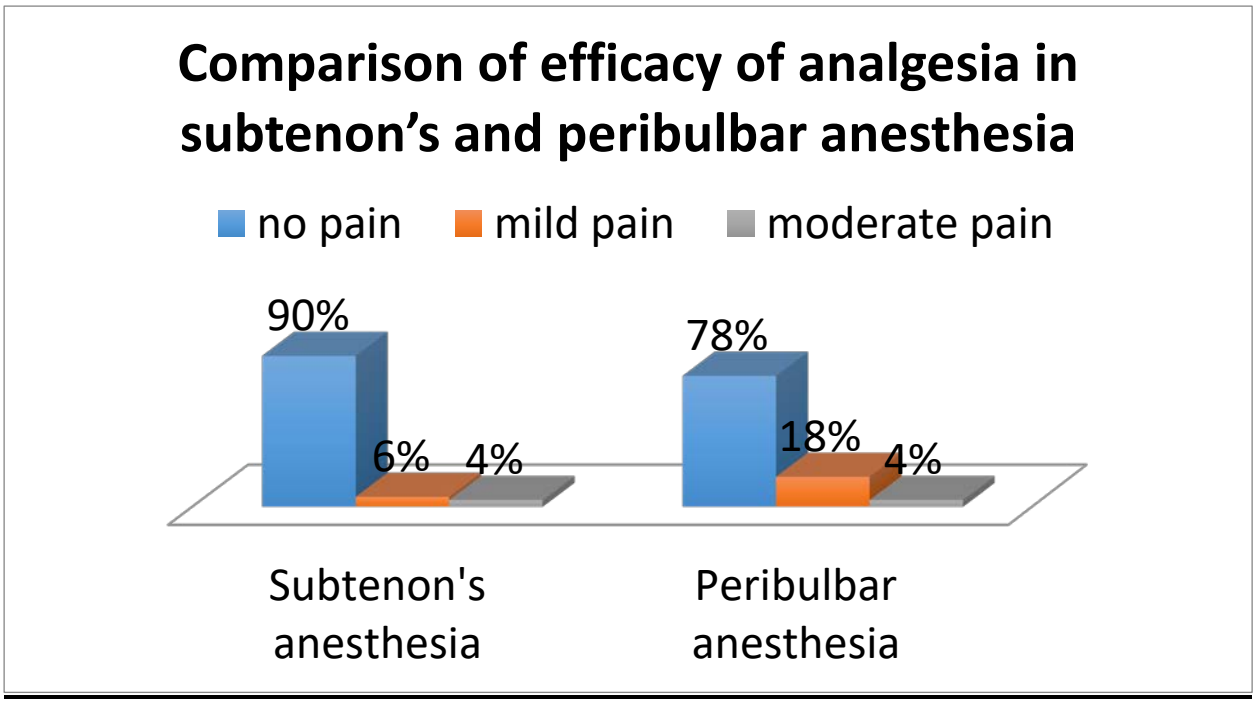
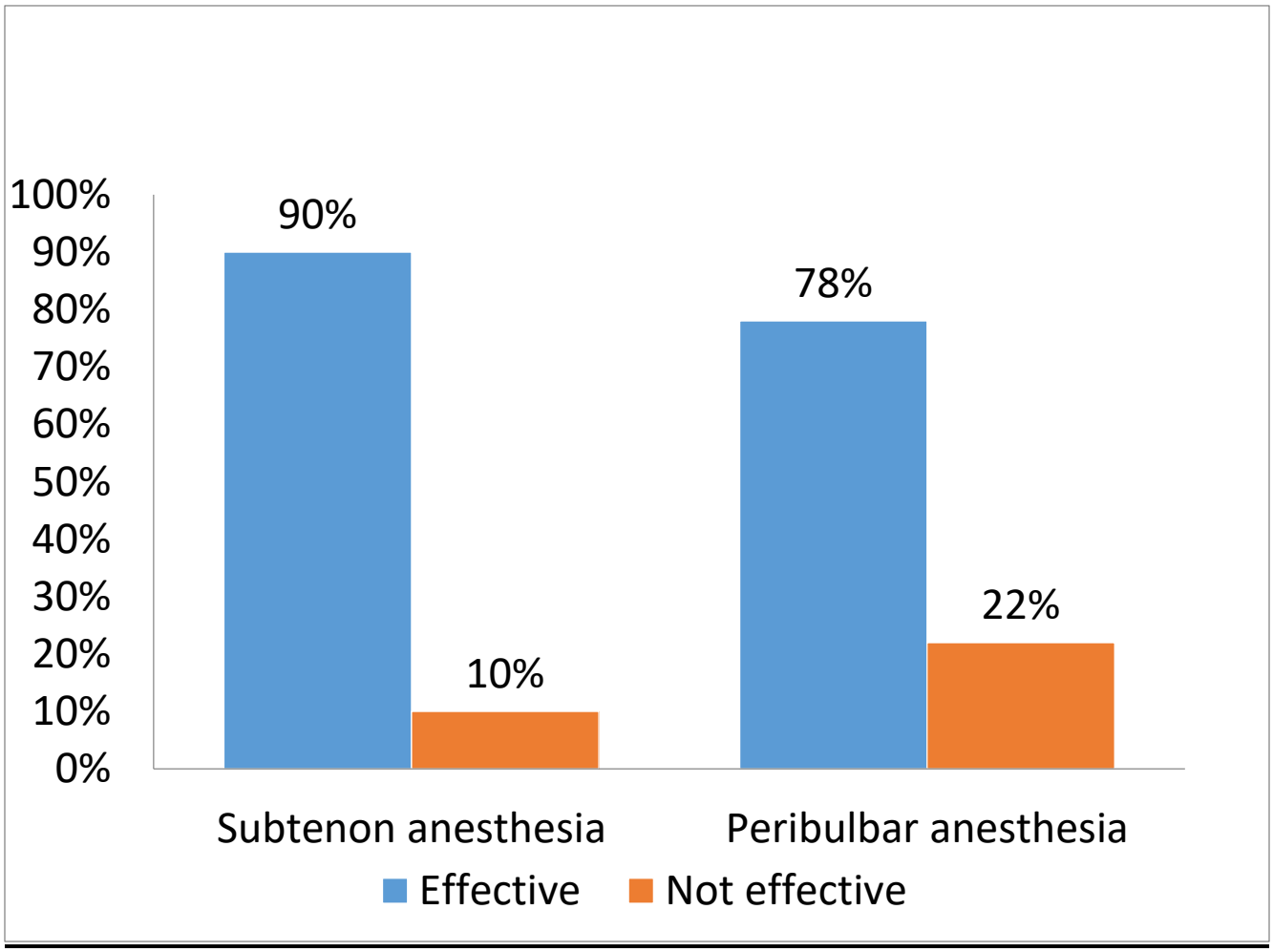


Table 3: Efficacy of Anesthesia in Patients with Single Site Versus Double Site Peribulbar Injection

Efficacy	Type of Anesthesia (n= 140)	
	A: Subtenons	B: Peribulbar
Effective	63 (90.0%)	55 (78.0%)
Not Effective	7 (10.0%)	15 (22.0%)
Total	70	70

P= 0.002

Figure 3: Efficacy of Anesthesia in Patients with Single Site Versus Double Site Peribulbar Injection



Discussion

A sample of 140 patients was collected from Department of Ophthalmology, Services Hospital Lahore. I started my assessment of both groups before the operation by speaking with the patients to evaluate their level of education, co-operation, hygiene, and answered any question from the patients. I choose a verbal pain score of 4 levels (0 = no pain, 1= mild pain, 2 = moderate pain which needs more analgesic, 3 = severe pain which is not tolerated and needs to stop the procedure).[12]

A visual analog scale like the Steven Scale was difficult to apply for our patients for social reasons and poor vision in old patients and some difficulties to assess further steps in the procedures of surgery. I modified my verbal score to enable me to speak to the patient at any time.[13]

In my study the data analysis showed that in group A that is subtenon anaesthesia, 63 (90.0%) patients experienced complete analgesia (pain score = Zero) and they experienced absolutely no pain during the procedure. 4 (6.0%) patients felt only mild pain (pain score= 1) which was tolerable, 3 (4.0%) patients felt moderate pain (pain score= 2), and none of our patients in this group experienced severe pain which has a score of 3 in our grading of analgesia [14].

In the 2nd group that is group B, in which peruibulbar anaesthesia was administered in 200 patients, 55 (78.0%) patients did not feel any pain at all, that is pain score of zero according to our grading criteria for analgesia, 13 (18.0%) patients expressed that they had mild pain during the procedure which was quite tolerable.[15] In this group, 3 (4.0%) patients experienced moderate pain (pain score=2) and again in this group, not a single patient experienced severe pain.[16,17]

In group A, the subtenon anaesthesia was effective in 63 (90.0%) patients and only 7 (10.0%) patients showed failure or ineffective anaesthesia in this group. While in group B, in which the

peruibulbar anaesthesia technique was used, only 55 (78.0%) showed complete effectiveness and in rest of the 15 (22.0%) patients this method of anesthesia did not prove effective.[18,19]

I have used analgesia in this study to assess the efficacy of anaesthesia as pain is the most important factor for the patients because if the patients are pain-free they are more relaxed and cooperative during the surgery. A further indicator of the efficacy of the block is the requirement of supplementary injection.[20]

Conclusion

The subtenon anaesthesia is an effective, safe and excellent alternative to double site peribulbar anaesthesia in providing analgesia for cataract surgery.

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