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Original Research Article

Comparison of peribulbar anesthesia and topical anesthesia on outcome of phacoemulsification

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ABSTRACT

Background: Due to advancement in phacoemulsification techniques, there has been growing shift from peribulbar anesthesia (PA) to topical anesthesia (TA). But dilemma exists regarding the supremacy of one over the other as both types have certain advantages and disadvantages.
Methods: A prospective study was conducted. Patients were divided into two groups. Group-1 underwent PA while group-2 underwent TA. Satisfaction score of patients and surgeons and incidence of complications were noted. The data was analyzed.
Results: Lowest patients' satisfaction score among group-1 vs. group-2 was 160 (87.9%) vs.82 (45.81%). Highest surgeons satisfaction score among group-1 and group-2 was 74(40.65%) vs. 2(1.1%). Intraoperative complications among the group-1 and group-2 were 35 (19.2%) vs. 86(48.0%).
Conclusions: While TA provides initial painless phase of surgical procedure, PA results in lesser intraoperative complications resulting in better visual outcome.

Keywords: Anesthesia, Complications, Peribulbar, topical, Phacoemulsification

INTRODUCTION

Various types of anesthesia are being used for phacoemulsification. It includes peribulbar, retobulbar, subtenon, intracameral and topical anesthesia. An ideal anesthetic should permit painless surgery without any systemic or local complications. It should also be cost-effective and should facilitate a comfortable procedure for surgeon as well. With advancement in phacoemulsification machines and expertise of surgeons, the duration of surgical procedure has become lesser. As a result search has been going on for a shorter acting anesthetic.[1] While peribulbar anesthesia (PA) was common earlier, there has been a shift towards topical anesthesia (TA). In 1993, TA for phacoemulsification was first performed by Kershner.[2] In United Kingdom only 3.5% underwent PA as compared to 21% which underwent TA.[3] While TA is believed to have advantage over PA in terms of safety, pain free, free of injection related complications, it has the disadvantage of increase anxiety for the patient as well as surgeon.[4,5] It is debatable to assign the supremacy of one type of anesthesia over the other.[6,7] It is to clear this dilemma; we have conducted a study to investigate the merits and demerits of the two techniques.

METHODS

A prospective study was conducted at department of ophthalmology, Geetanjali Medical College and Hospital from July 2016 to December 2016. All the patients presenting with complaint of dimness of vision and diagnosed with cataract were enrolled for the study. Written informed consent was obtained from all the patients and permission from ethics committee of the institute was taken. Exclusion criteria were corneal opacity, complicated cataract and associated systemic morbid conditions. All the patients underwent complete

ophthalmic examination which included slit lamp biomicroscopy, indirect ophthalmoscopy and applanation tonometry. Patients were randomly divided into two groups by a masked distributor. Group 1 underwent PA and group 2 underwent TA. Group-1 had 182 patients while group-2 had 179 patients. All the surgeries were done by single surgeon by standard technique of phacoemulsification of modified chop. Foldable intraocular lens (IOL) was implanted in all uneventful cases. If posterior capsular rupture occurred then, rigid IOL was implanted in the ciliary sulcus after enlarging the corneal section to 6 millimeters. This wound was sutured by 10-0 silk interrupted sutures. Postoperative examination was done on day 1, 7, 30 and 45. Satisfaction score of patients and surgeons was graded from lowest to highest in terms of 0, 1, 2, 3, 4, and 5. Intraoperative and postoperative complications were noted. All the data was entered in excel sheet and the results were analyzed by Statistical Package for the Social Sciences (SPSS version 18.0). P value>0.05 was considered statistically significant.

RESULTS

Total number of patients in group-1 was 182 of which 95 (52.19%) were male. Group-2 had a total of 179 of which 93 (51.95%) were male.

Table 1: Distribution of males and females among the two groups.

	Group-1	Group-2
Male	95	93
Female	87	86
Total	182	179

In group-1, as much as 172 (94.5%) patients reported ≤2 whereas only 13 (7.1%) patients reported a score of ≥3. In group-2, as much as 134 (74.86%) patients reported ≤2 whereas 45 (25.13%) patients reported a score of ≥3.

Table 2: Patient satisfaction score during the surgery among the males and females in group-1.

Group-1						
Satisfaction score	**0**	**1**	**2**	**3**	**4**	**5**
Male	84	2	4	3	1	1
Female	76	3	3	2	1	2
Total	160	5	7	5	2	3

Table 3: Patient satisfaction score during the surgery among the males and females in group-2.

Group-2						
Satisfaction score	**0**	**1**	**2**	**3**	**4**	**5**
Male	44	16	9	8	7	7
Female	38	18	9	8	7	8
Total	82	34	18	16	14	15

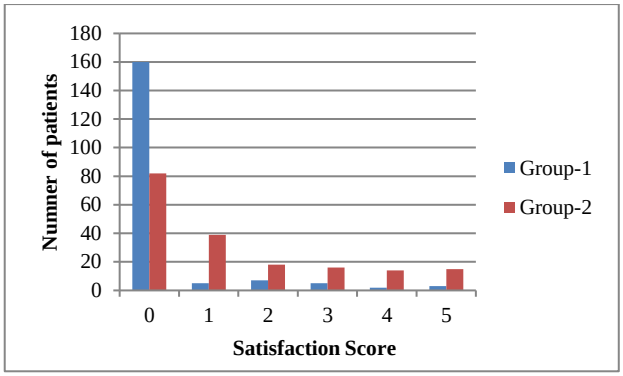

Figure 1: Patient satisfaction level amongst different groups.

The operating surgeon reported the satisfaction score ≥3 in 133 (73.07%) and ≤2 in 49 (26.92%) in group-1. Among the group-2 patients, satisfaction score ≥3 was reported only in 9 (5.02%) and ≤2 in 166 (92.73%).

Table 4: Surgeon satisfaction score during the surgery among males and females in group-1.

Group-1						
Satisfaction score	**0**	**1**	**2**	**3**	**4**	**5**
Male	5	7	11	13	17	42
Female	6	8	12	14	15	32
Total	11	15	23	27	32	74

Table 5: Surgeon satisfaction score during the surgery among males and females in group-2.

Group-2						
Satisfaction score	**0**	**1**	**2**	**3**	**4**	**5**
Male	42	34	12	2	2	1
Female	42	33	3	2	1	1
Total	84	67	15	4	3	2

Intraoperative complications were noted in 86 (48.0%) patients in group-2 as compared to only 35 (19.2%) patients in group-1.

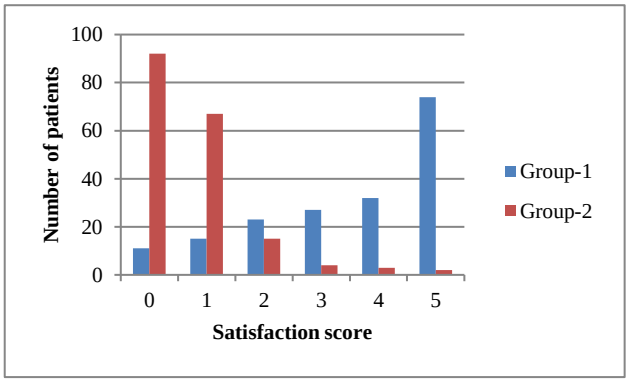

Figure 2: Surgeon satisfaction level amongst different groups.

Table 6: Intraoperative complications amongst the two groups.

	Group-1	Group-2
Male	22 (23.1%)	44 (47.3%)
Female	13 (14.9%)	42 (48.83%)
Total	35 (19.2%)	86 (48.0%)

While intraoperative rupture of posterior capsule was noted in 35 (19.23%) patients of whom post-operative macular oedema developed in 23 in group-1, 86 (48.04%) patients had rupture of posterior capsule of which 36 developed postoperative macular oedema in group-2.

Table 7: Incidence of intraoperative and postoperative complications in the two groups.

	Group-1	Group-2
Posterior capsule rupture	35	86
Macular oedema	23	36
Surgical induced astigmatism>1D	4	57

DISCUSSION

The advancements in cataract surgery from extracapsular extraction to phacoemulsification has made possible the transition from PA and subtenon anesthesia to TA.[9-12] While PA has a drawback of pain, discomfort and heaviness during the initial phase of injection procedure ,it has the advantage of painless surgery during the rest of the procedure.[13,14] On the other hand, TA has a major advantage of totally painless phase during the anesthesia phase but a big drawback of anxious phase during the entire surgical procedure.[15-17]

This anxiety is present not only on part of the patient but on the surgeon as well. Patient's anxiety leads to eye squeezing and raised intraocular pressure leading to forward moving of posterior capsule. At the same time, surgeon's anxiety leads to a part of his attention diverting towards managing the eye position and additional intraoperative communications with the patient for proper eye focus during the surgery. These two factors combine to most unforgiving and unfortunate outcome of posterior capsule rupture and its attendant complications like nucleus drop, enlargement of wound, non-physiological IOL position, suturing the wound and prolonged duration of the surgery.[18]

Although there is a growing trend towards shifting from PA to TA, the choice of anesthesia to be used which gives the best visual outcome has been debatable with conflicting reports in several studies.[19-22] Present study has shown that although the pain and discomfort was lesser with TA, intraoperative complications were lesser and visual outcome was better with PA. Lowest patient satisfaction was reported from as high as 160 patients of group-1 as compared to only 82 of group-2 (p>0.05). This could be due to initial pain free stage of anesthesia of TA as compared to painful injection phase of PA. Contrasting to this, lowest surgeon satisfaction was reported from a large number of surgeons from group-2 as compared to group-1 (92 vs. 11; p-value>0.05). Moreover, surgeons were highly satisfied in group-1 as compared to group-2 (74 vs. 2; p-value>0.05). This shows that surgeon satisfaction was more with PA which could be due to lesser intraoperative eye movements, better eye focusing, better surgical maneuvers. This in turn lead to lesser intraoperative complications with PA as compared to TA which has been demonstrated in our study (35 vs. 86; p-value>0.05).

While the patient satisfaction was more with TA surgeon satisfaction was more with PA. We feel that surgeon's satisfaction should take precedence over patient satisfaction because surgical outcome will be better when surgeon is less anxious and more comfortable during the surgery. We also suggest the growing inclination towards TA needs to be discouraged keeping in view the patients long term visual outcome.

The limitation of this study was short study duration and a small sample size. So a study with a larger sample size over a longer duration is suggested.

CONCLUSION

While TA provides initial painless phase of surgical procedure, PA results in lesser intraoperative complications resulting in better visual outcome.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Parkar T, Gogate P, Deshpande M, Adenwala A, Maske A, Verappa K. Comparison of Sub-Tenon anaesthesia with peribulbar anaesthesia for manual small incision cataract surgery. Indian J Ophthalmol. 2005;53:255-9.
2. Kershner RM. Topical anesthesia for small incision self-sealing cataract surgery. A prospective evaluation of the first 100 patients. J Cataract Refract Surg. 1993;19:290-2.
3. Eke T, Thompson JR. Serious complications of local anaesthesia for cataract surgery: A 1 year national survey in the United Kingdom. Br J Ophthalmol. 2007;91:470-5.
4. Stupp T, Hassouna I, Soppart K, Thanos S, Förster W. Systemic adverse events: A comparison between topical and peribulbar anaesthesia in cataract surgery. Ophthalmologica. 2007;221:320-5.
5. Davison M, Padroni S, Bunce C, Rüschen H. Sub-Tenon's anaesthesia versus topical anaesthesia for cataract surgery. Cochrane Database Syst Rev. 2007;18:CD006291.

6. Gangolf G, Jost BJ. Topical versus peribulbar anesthesia for cataract surgery. Acta Ophthalmol Scand. 2003;81:596-9.
7. Said K, Hassan M, Qahtani FA. A comparative study of topical versus peribulbar anesthesia in phacoemulsification and implantation of foldable intraocular lens in cataract surgery. IJOVS. 2003;2(1).
8. Malik A, Fletcher EC, Chong V, Dasan J. Local anesthesia for cataract surgery. J Cataract Refract Surg. 2010;36:133-52.
9. Vargas LG, Peng Q, Escobar-Gomez M, Schmidbauer JM, Apple DJ. Overview of modern foldable intraocular lenses and clinically relevant anatomy and histology of the crystalline lens. Int Ophthalmol Clin. 2001;41:1-15.
10. Fichman RA. Use of topical anesthesia alone in cataract surgery. J Cataract Refract Surg. 2001;22:612-4.
11. Gills JP, Cherchio M, Raanan MG. Unpreserved lidocaine to control discomfort during cataract surgery using topical anesthesia. J Cataract Refract Surg. 1997;23:545-50.
12. Kallio H, Rosenberg PH. Advances in ophthalmic regional anesthesia. Best Pract Res Clin Anaesthesiol. 2005;19:215-27.
13. Hamilton RC. Brain stem anesthesia following retro bulbar blockade. Aesthesiology. 1985;63:688-90.
14. Hamilton RC, Gimbel HV. Regional anesthesia for 12000 cataract extraction and IOL. Can J Anaesth. 1988;35:615-23.
15. Fichman RA. Topical technique appear safer in patient with anticoagulant Anesthesia. Intensive Care. 2001;29:8-11.
16. Bardocci A, Lofoco G, Perdicaro S, Ciucci F, Manna L. Lidocaine 2% gel versus lidocaine 4% unpreserved drops for topical anesthesia in cataract surgery: a randomized controlled trial. Ophthalmology. 2003;110:144-9.
17. Soliman MM, Macky TA, Samir MK. Comparative clinical trial of topical anesthetic agents in cataract surgery: lidocaine 2% gel, bupivacaine 0.5% drops, and benoxinate 0.4% drops. J Cataract Refract Surg. 2004;30:1716-20.
18. Monestam E, Kunsik M. Prelimbal topical anesthesia was an effective and easy. Sweden Cataract Refer Surg. 2000;26:1403-8.
19. Boezaart A, Berry R, Nell M. Topical anesthesia versus retrobulbar block for cataract surgery: The patients' perspective. J Clin Anesth. 2000;12:58-60.
20. Johnston RL, Whitefield LA, Giralt J, Harrun S, Akerele T, Bryan SJ, et al. Topical versus peribulbar anesthesia, without sedation, for clear corneal phacoemulsification. J Cataract Refract Surg. 1998;24:407-10.
21. Khezri MB, Merate H. The effects of melatonin on anxiety and pain scores of patients, intraocular pressure, and operating conditions during cataract surgery under topical anesthesia. Indian J Ophthalmol. 2013;61:319-24.
22. Trikha S, Turnbull AM, Morris RJ, Anderson DF, Hossain P. The journey to femtosecond laser-assisted cataract surgery: New beginnings or a false dawn? Eye (Lond). 2013;27:461-73.

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