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To compare the pain, visual acuity, surgeon satisfaction of manual small incision cataract surgery done under topical anaesthesia combined with intracameral lignocaine versus peribulbar anaesthesia

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ABSTRACT

Background: With the advancement of the surgical technique Manual small incision cataract surgeries (MSICS) are now being performed under Topical anaesthesia (TA) instead of peribulbaranaesthesia(PA).In this study we evaluated patients and surgeon experience using these two anaesthetic technique in MSICS

Aims and Objectives: To compare the pain, visual acuity, surgeon satisfaction of Manual small incision cataract surgery done under Topicalanaesthesia combined with intracameral lignocaine versus Peribulbaranaesthesia.

Material and Method: A hospital based cross sectional study was conducted in the Department of ophthalmology ,Assam Medical College and Hospital. The study included two groups, each group having 42 patients, group I undergoing cataract surgery with peribulbaranaesthesia, while group II under topical anaesthesia.Visual analogue pain scale was used to assess patient pain during anaesthesia and surgery. Surgeon satisfaction was evaluated in terms of intraoperative difficulty.

Result: In regard to pain during surgery there was no statistically significant difference between the two groups (P value 0.696). In case of visual acuity thereis significant difference between the two groups on first postoperative day (P value 0.013), while there was no difference between the two groups at 4 th week(P value 0.547).Surgeon didn't encounter any intraoperative difficulty in both the groups.

Conclusion: Topical anaesthesia can be a better, safer , time saving alternative to peribulbaranaesthesia for Manual small incision cataract surgery.

Keywords:
Anaesthesia, peribulbar, visual acuity,visual analogue pain scale (VAPS)

I. INTRODUCTION:

Cataract is the leading cause of blindness worldwide[1]. The only treatment option for cataract is surgical removal of the opaque lens and implantation of an artificial intraocular lens[2]. A good anaesthesia is must for every surgery. An ideal anaesthetic agent should provide painless surgery without any local or systemic complication. It should be cost effective and should also provide a comfortable platefrorm for the surgeon as well[3].With the advancement of surgical technique including the use of smaller incision Topical anaesthesia has steadily gained popularity due to ease of administration,rapid visual recovery postoperatively and lack of complication associated with peribulbar anaesthesia[4]. In this study we compare experience of patient as well as surgeon regarding the surgery with TA & PA.

Aims and Objectives: To compare the pain, visual acuity, surgeon satisfaction of Manual small incision cataract surgery done under Topical anaesthesia versus Peribulbaranaesthesia

Material and Method: A hospital based cross sectional study was conducted in the Department of ophthalmology,Assam Medical College and Hospital,from July 2021 to June 2022. The study was approved by Hospital ethic committee. The study included two groups, having 42 patients in each, group I patient undergoing cataract surgery with peribulbaranaesthesia, while group II under topical anaesthesia.

Patients were included if they were above 50 years and above and with uncomplicated cataract.

Exclusion criteria: Uncoperative patient, Nasolacrimal duct obstruction, nystagmus, Allergic to proparacaine, lignocaine, bupivacaine,

A written and informed consent was taken from each of the participant of the study. A thorough clinical as well as detailed ophthalmological examination of all the patient were done. Antibiotics drops were instilled 2 hourly a day before surgery. Mydriasiswere achieved by using tropicamide 0.8% and phenylephrine 5% solution half to one hour before surgery. All the surgeries were performed by single surgeon.

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For PA, 5 ml mixture of 2% lignocaine and 0.5% bupivacaine plus 1500 IU/ml of hyaluronidase was injected at the junction of middle 2/3 and lateral 1/3 of lower lid margin with 24 G needle directed towards the floor of the orbit with the bevel facing the globe.

For TA,0.5% proparacaine hydrochloride solution was used . 2 drops of the medication were instilled into the operating eye repeated thrice each instillation being 5 minute apart 10 minute before surgery. Topical anaesthesia was supplemented by intracameral injection of 0.5 ml preservative free 1% lignocaine before capsulorrhexis. Before the start of the surgery betadine 5% was instilled into the conjunctival sac and was irrigated with ringer lactate after 1-2 minute.

All patient in both the groups were operated by same technique of MSICS with PCIOL implantation in all uneventful cases.

On completion of the surgery each patient was shown a VAPS as described by Steven[5] with numeric rating from 0-10where 0=no pain, 2= mild discomfort, 4= mild pain, 6= moderate pain, 8 = severe pain, 10 = excruating, unbearable pain and patient were asked to grade the level of pain felt during administration of anaesthesia and during surgery.

The surgeons were asked at the end of each surgery to grade any difficulty encountered during surgery based on patient's cooperation, difficulty due to ocular movement, anterior chamber stability and any complications or adverse events.Surgeon was given a closed ended questionnaire and the surgical experience was scored as 1= Excellent surgeon satisfaction, score 2= Good & score 3= poor surgeon satisfaction.

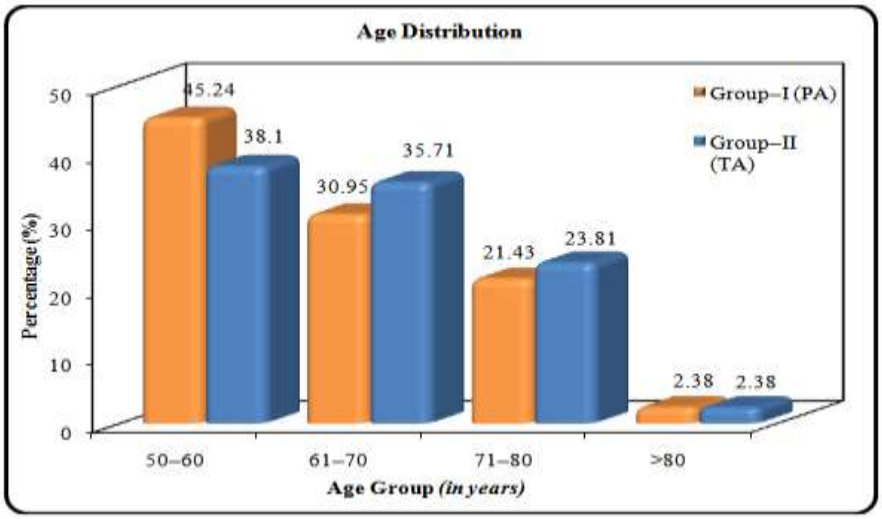
II. STATISTICAL ANALYSIS:

Results on continuous measurement are presented as mean±standard deviation.Outcome measures were compared using student t test. Discrete data are expressed as number (%) and are analysed using chi square test and Fisher's exact test. For all analyses, the statistical significance was fixed at 5% level (P value <0.05).

III. RESULTS:

AGE DISTRIBUTION:

Age Group (in years)	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
50–60	19	45.24	16	38.10
61–70	13	30.95	15	35.71
71–80	9	21.43	10	23.81
>80	1	2.38	1	2.38
TOTAL	42	100.00	42	100.00



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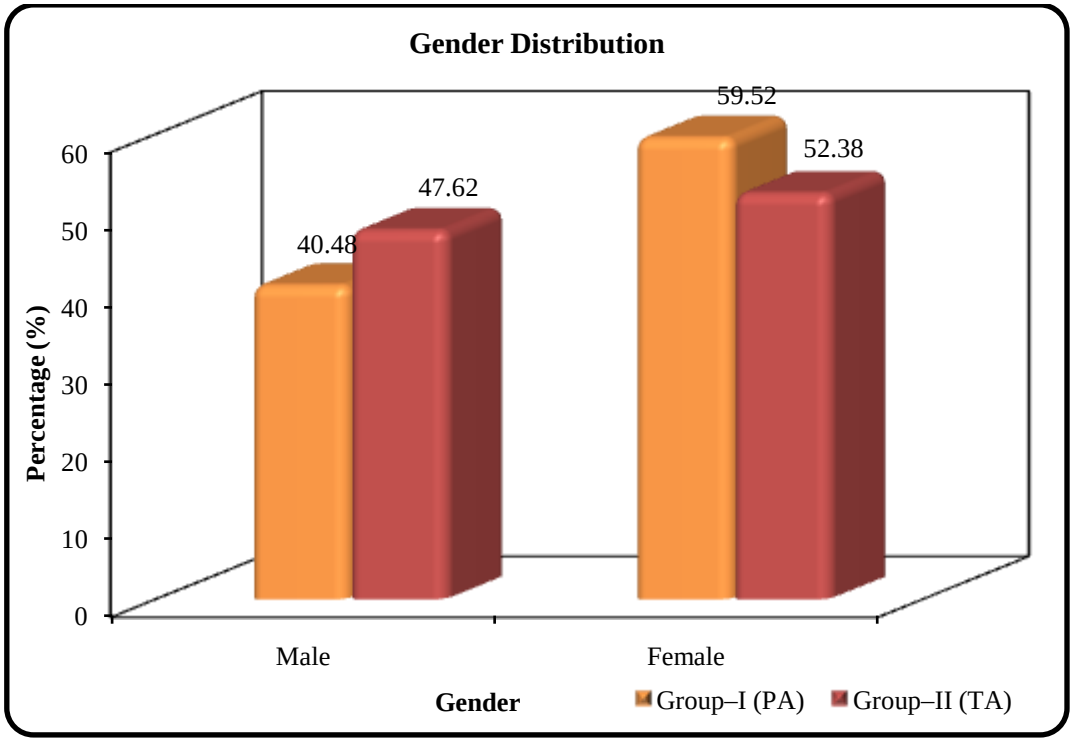
SEX DISTRIBUTION:

Gender	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
Male	17	40.48	20	47.62
Female	25	59.52	22	52.38
TOTAL	42	100.00	42	100.00



The mean age of the patients in Group I was 63.31±9.31 years & in Group II was 64.81±8.55. P value was 0.444, not significant. In group I, 40.48% patients were male 59.52% were female.In group II, 47.62% were male while 52.38% were female. P value 0.509, not significant.

VISUAL ANALOGUE PAIN SCORE DURING ANAESTHESIA

Grading of Pain	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
Grade 0 (0–2)	0	0.00	35	83.33
Grade 1 (3–4)	36	85.71	7	16.67
Grade 2 (5–6)	5	11.90	0	0.00
Grade 3 (7–8)	1	2.38	0	0.00
Grade 4 (9–10)	0	0.00	0	0.00
TOTAL	42	100.00	42	100.00

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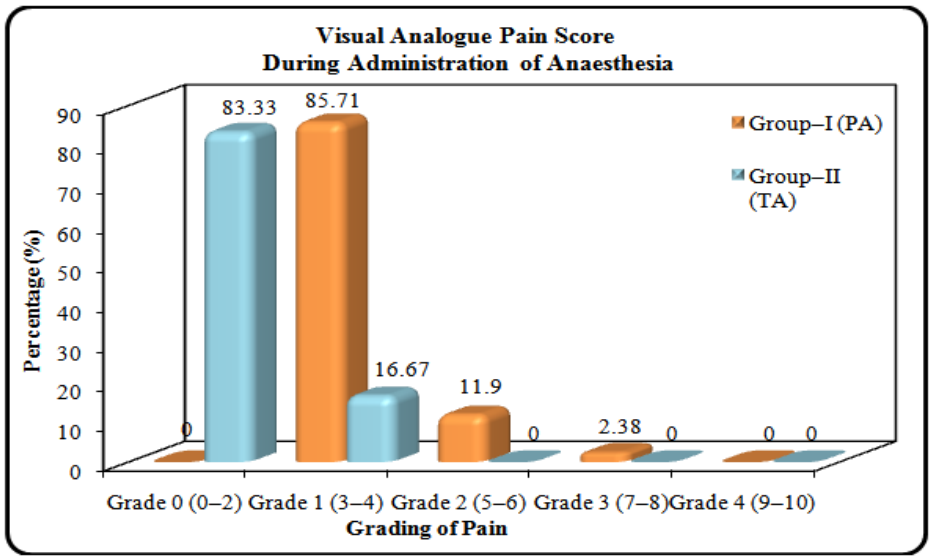
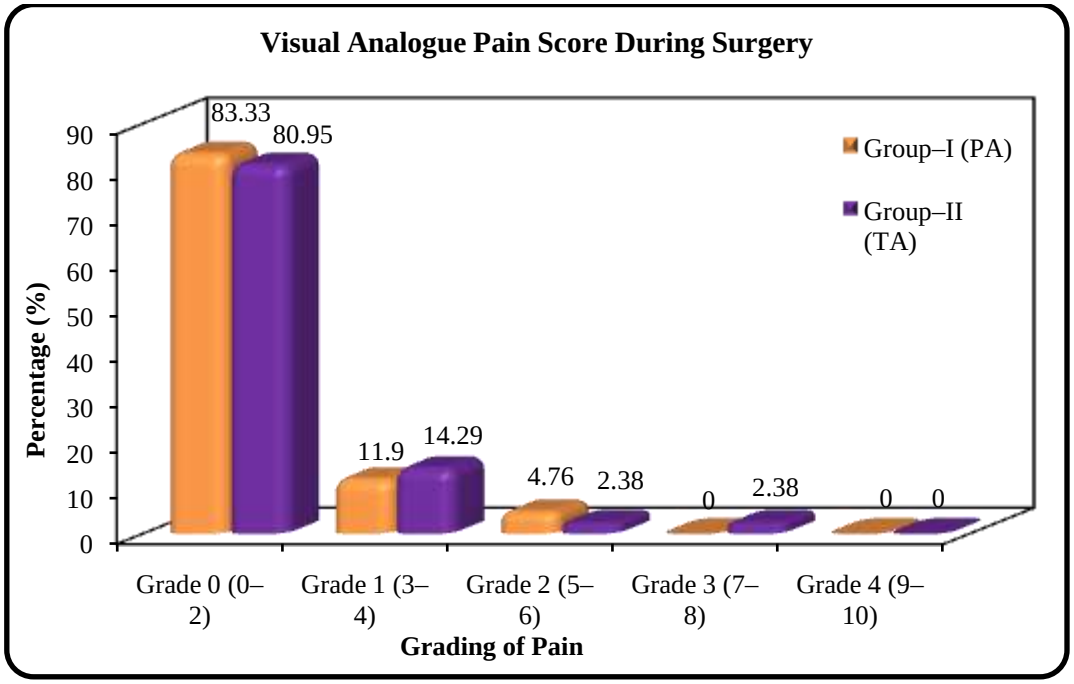


VISUAL ANALOGUE PAIN SCORE DURING SURGERY:

Grading of Pain	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
Grade 0 (0–2)	35	83.33	34	80.95
Grade 1 (3–4)	5	11.90	6	14.29
Grade 2 (5–6)	2	4.76	1	2.38
Grade 3 (7–8)	0	0.00	1	2.38
Grade 4 (9–10)	0	0.00	0	0.00
TOTAL	42	100.00	42	100.00



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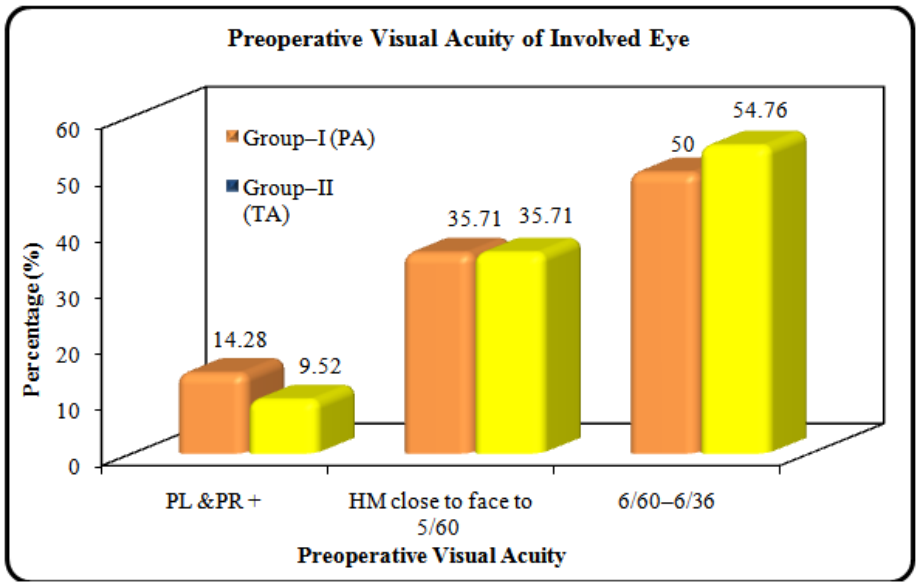
The mean pain score during administration of anaesthesia in Group I was 3.67 (SD±0.98) & mean pain score during administration of anaesthesia in Group II was 0.98 (SD±1.14),we found a statistically significant difference **(Pvalue <0.001**) between the two groups regarding pain during administration of anaesthesia.

The mean pain score during surgery in Group I was 0.83 (SD±1.51) and mean pain score during surgery in Group II was 0.95 (SD±1.68)
There is no statistically significant difference **(P value 0.733**) between the two Groups regarding pain during surgery.

PREOPERATIVE VISUAL ACUITY OF INVOLVED EYE:

Preoperative Visual Acuity	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
PL &PR +	6	14.28	4	9.52
HM close to face to 5/60	15	35.71	15	35.71
6/60-6/36	21	50.00	23	54.76
TOTAL	42	100.00	42	100.00



Applying Fisher Exact Test there is no significant difference between the two Groups in terms of preoperative visual acuity (**P value 0.782) (Not significant)**\

POSTOPERATIVE VISUAL ACUITY AT DAY 1 (UNCORRECTED):

Postoperative uncorrected Visual Acuity, Day 1	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
6/60 or less	14	33.33	7	16.67
6/36–6/18	18	42.86	12	28.57
6/12–6/6	10	23.81	23	54.76
TOTAL	42	100.00	42	100.00

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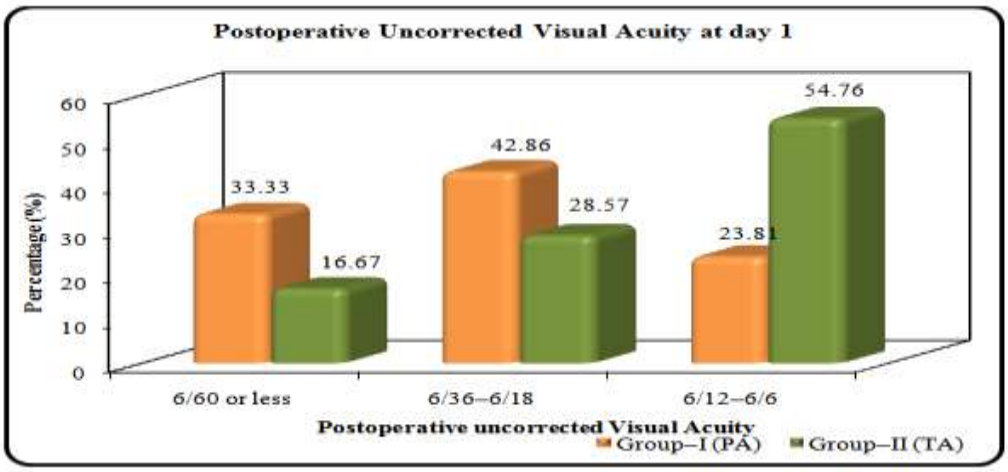
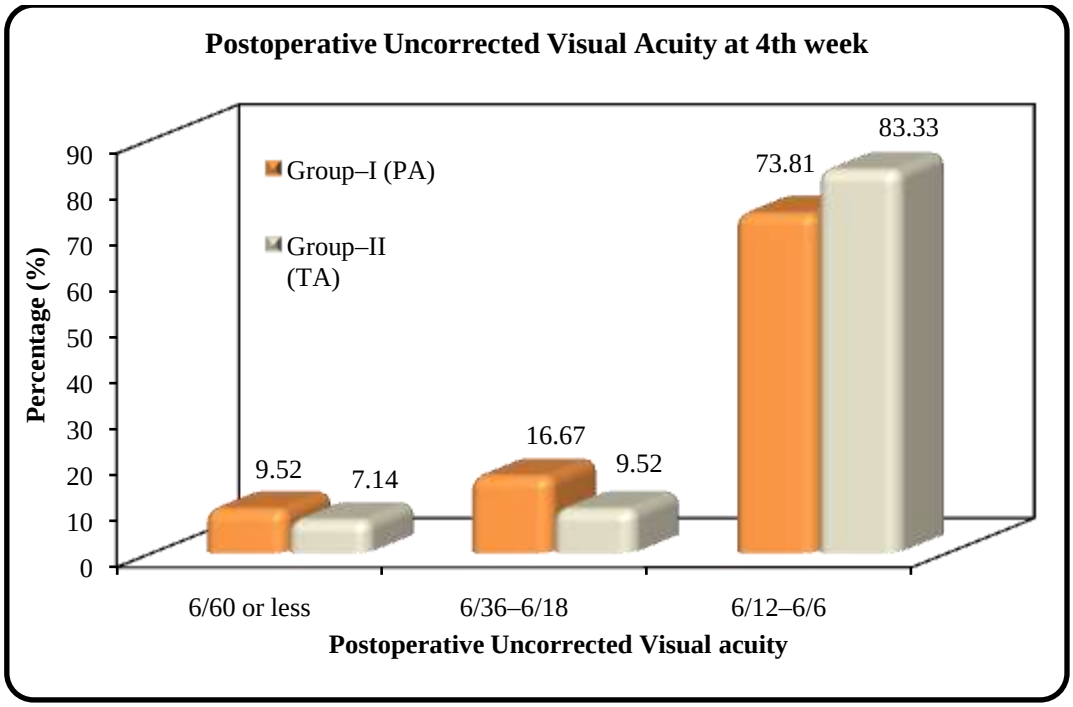


In our study applying Chisquare test we found that on first postoperative Day there is statistically significant difference in uncorrected visual acuity of the two Groups**.(P value 0.013**).(significant)

POSTOPERATIVE UNCORRECTED VISUAL ACUITY AT 4TH WEEK:

Postoperative Uncorrected Visual acuity, 4th week	**Group–I (PA)**		**Group–II (TA)**	
	Number	**Percentage**	**Number**	**Percentage**
6/60 or less	4	9.52	3	7.14
6/36–6/18	7	16.67	4	9.52
6/12–6/6	31	73.81	35	83.33
TOTAL	42	100.00	42	100.00



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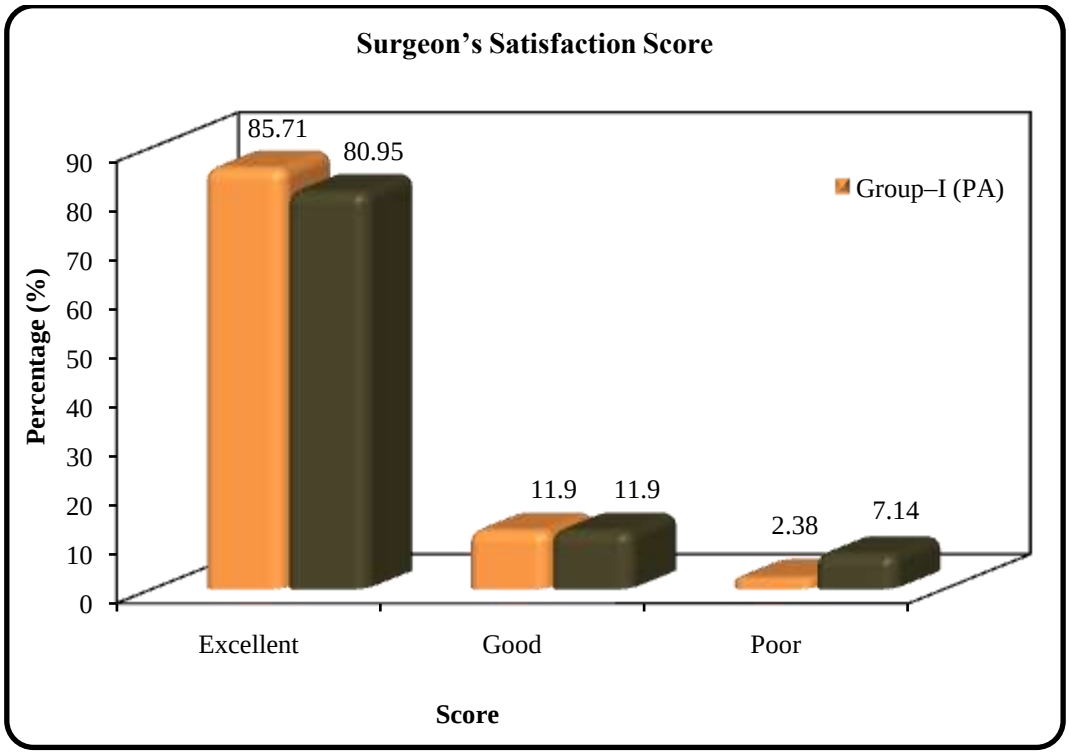
Applying Fisher Exact test ,it is found that there is no statistically significant difference between the two Groups in terms of uncorrected visual acuity at 4th week. (**P value 0.547**) (Not significant).

SURGEON SATISFACTION SCORE:

Score	Group–I (PA)		Group–II (TA)	
	Number	Percentage	Number	Percentage
Excellent	36	85.71	34	80.95
Good	5	11.90	5	11.90
Poor	1	2.38	3	7.14
TOTAL	42	100.00	42	100.00



We analysed surgeon satisfaction at the end of each surgery based on patients' cooperation, unwanted ocular movement and in terms of anterior chamber stability during surgery. After applying Fisher Exact testit was found that there is no statistically significant difference between the two Groups in terms of Surgeon satisfaction during surgery. (**P value 0.589**) (not significant).

IV. DISCUSION:

In this study 85.71% patients had mild pain,11.9% patients had moderate pain during peribulbar injection, while 83.33% patients had no pain , 16.67% patients had mild pain during during topical anaesthesia. One patient had severe pain during peribulbar injection. The finding was statistically significant, (p value <0.001). Patients felt the pain during insertion of the needle for peribulbaranaesthesia. Similar finding was observed by Joseph B et al[6] , Dole K et al [7] in their studies in regards to pain during administration of anaesthesia.

In this study measurement of pain felt by the patients during surgery in both peribulbar and topical anaesthesia group was done by showing visual analogue scale (VAS) to each patient at the end of the surgery. The patients felt pain when viscoelastic was being injected into the anterior chamber before capsulorrhexis (4 patient in Group I, 5 Patients in Group II), during the stretching of

the sclero-corneal tunnel while delivering the the nucleus (3 patients in Group I, 2 patients in Group II), & during the irrigation aspiration procedure (1 patient in Group II) with Simcoe IA cannula. There is no statistically significant difference between the two groups (p value 0.733) in regard to pain during surgery. Our observation was comparable with the study finding of Sauder G et al [8], Pablo LE et al [9].

It is found that found that on postoperative day 1 about 23.81% of patients in Group I (PA) had the uncorrected visual acuity of >6/18 as against 54.76% of patients in the Group II (TA). This was statistically significant (P value of 0.013). Shammas HJ et al [10] in their study reported that uncorrected visual acuity between the two Groups was significant on postoperative day 1. (p value 0.01). Coelho RP et al in their study reported that visual recovery is faster in the Topical anaesthesia group (90% >6/36) than the peribulbar anaesthesia group (62% >6/36) on postoperative day 1 which was statistically significant (P value 0.004).

On postoperative 4th week,it was found that about 73.81% of patients in Group I (PA) had the UCVA of > 6/18 and 83.33% of patients in Group II (TA) had UCVA of >6/18. This finding was statistically insignificant (P value 0.547). Similar finding was observed by Bhat MA et al [12] where they found about 80% patients in Group I(PA) & 84% patients in Group II(TA) had UCVA of >6/18 on postoperative 6 th week.

In the study surgeon satisfaction was evaluated based on patient‘s cooperation, unwanted ocular movement and in terms of anterior chamber stability during surgery. We observed surgeon satisfaction was Excellent in 36 (85.71%) patients, good in 5 (11.90%), poor in 1 (2.38%) patient in Group I (PA). Surgeon satisfaction was Excellent in 34 (80.95%), good in 5 (11.90%), and poor in 3 (7.14%) patients in Group II (TA). The observation was statistically insignificant. (P value 0.589).

Dole K et al [7] in 2014 in their study found that response to questions related to surgeon‘s comfort while performing surgery suggested that 4.6% cases in peribulbar anaesthesia & 9.2% cases in Topical anaesthesia was not satisfactory.The observation is comparable to the observation of our present study. Ahmad N et al [13] in their study in 2014 found that surgeon faced less difficulty during operation in patients who underwent a peribulbar block. Their finding was statistically significant. (P value 0.046). Difference in the observation may be due to use of intracameral lignocaine in our study.

V. CONCLUSION:

In our study, patients undergoing Manual Small Incision Cataract Surgery with intraocular lens implantation under Topical anaesthesia combined with intracameral lignocaine and under peribulbar anaesthesia had similar experience in terms of intraoperative pain. Intraoperative efficacy of anaesthesia were comparable between the two Groups. Operating condition from the surgeon point of view were also comparable between the two groups.

Better consistency of analgesia can be maintained during surgery by topical anaesthesia and intracameral anaesthetic agent.

Considering the observation of our study, Topical anaesthesia could be a safer, better, time saving alternative to peribulbar anaesthesia for Manual Small Incision Cataract surgery.

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