

Topical Anesthesia in High Volume Cataract Surgery: Pain Evaluation and Feasibility Study

Sanjiv Kumar Gupta^{1*}, Ajai Kumar², Arun K Sharma¹, Siddharth Agrawal¹, Vishal Katiyar¹ and Rajat Mohan Shrivastava¹

¹King George's Medical University, Lucknow, Uttar Pradesh, India

²Jankalyan Eye Hospital, Lucknow, Uttar Pradesh, India

*Corresponding author: Sanjiv Kumar Gupta, MS, King George's Medical University, 18/464, Indira Nagar, Lucknow, Uttar Pradesh, India, Tel: +91-9532998211; E-mail: sanjiv204@gmail.com

Received date: August 02, 2015; Accepted date: November 23, 2015; Published date: November 30, 2015

Copyright: © 2015 Gupta SK, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Context: This study was undertaken to evaluate the use of topical anesthesia for Manual small incision cataract surgery in high volume cataract surgery setup.

Aims: The primary aim was to evaluate the pain experience of the patients undergoing Manual Small Incision Cataract Surgery (MSICS) under topical anesthesia using 2% lignocaine jelly in high volume cataract surgery setup. Secondary aims were to study any relation between the pain experience and education status, gender and age of the patients.

Settings and Design: The study was an Interventional case series conducted at a tertiary care eye hospital.

Methods and Material: Patients screened at the peripheral field camps were transported to base hospital and underwent MSICS under topical anesthesia using lignocaine 2% jelly and intracameral 0.5% lignocaine solution.

Demographic data and pain experience of the patients during the surgery was recorded and analyzed.

Statistical analysis: Statistical analysis was done using MedCalc® version 12.2.1.0 software for Windows 7. Descriptive analysis, Mann-Whitney test, Kruskal-Wallis test, and Spearman's rho coefficient were used to analyze the data.

Results: The study included 270 patients, with average age 62.7 years. Average pain score was 1.6 units (SD ± 0.72, scale 1-5) with ~85% patients reporting comfortable experience. Pain perception had no relation to gender, education status or age.

Conclusions: Manual Small Incision Cataract Surgery under topical anesthesia using lignocaine 2% jelly and intracameral lignocaine, in high volume cataract surgeries safe and comfortable to majority of patients and is unaffected by gender, age or educational status of the patients.

Keywords: Manual small incision cataract surgery, Topical anesthetics, High volume cataract surgery, Rural patients, Pain, Educational status, Lignocaine jelly, Intracameral anesthesia

Key Message

Manual Small Incision Cataract Surgery under topical anesthesia using lignocaine 2% jelly and intracameral lignocaine, in high volume cataract surgery setup involving rural patients is safe and comfortable to the patients. There is no relation between the pain experience and gender, age or educational status of the patients.

Introduction

In a study on the cost-benefit analysis of the World Bank-assisted Cataract Blindness Control Project, it was found that peripheral screening camps followed by surgery at base hospitals were the most cost-effective method for conducting cataract operations [1]. Thus the

need and continuation of these bulk surgery camps will remain and increase with time if we want to eradicate the blindness due to cataract surgery.

Presently the high volume cataract surgeries are done largely using Manual Small Incision Cataract Surgery [2], which is comparable to phacoemulsification surgery in terms of results and at the same time it is more cost effective [3]. Use of topical anesthesia in Manual Small Incision Cataract Surgery has been demonstrated to be effective in a study by Gupta et al. [4]. In another study by Gupta et al. [5] have also demonstrated that Manual Small Incision Cataract Surgery under topical anesthesia is comparable to standard phacoemulsification under topical anesthesia, in terms of pain experienced by the patients and surgical outcome.

Following the present evidence that Manual Small Incision Cataract Surgery is the most cost-effective technique for mass cataract surgery with results comparable to Phacoemulsification and effectiveness of topical anesthesia we have undertaken this study to evaluate the use of

Manual Small Incision Cataract Surgery under topical anesthesia in bulk cataract surgery at hospital in patients screened at rural setup and brought to hospital.

The primary aim was to evaluate the pain experience of the patients undergoing Manual Small Incision Cataract Surgery under topical anesthesia using 2% lignocaine jelly in high volume cataract surgery involving rural population. Secondary aims were to study any relation between the pain experience and education status, gender and age of the patients.

Subjects and Methods

A team consisting of trained optometrists visited the rural area and the patients were screened for cataract and transported to the base hospital. Patients scheduled for surgery were screened for exclusion criteria (Table 1) and included in the study after obtaining their informed consent. The patients operated during 6 days were included in the study. Demographic data including educational status was collected from all the participants.

All the patients underwent cataract surgery under topical anesthesia using technique described by Gupta et al. [5]. Patients were interviewed within ½ hour of the surgery in the postoperative recovery room, to grade the pain experienced, using a grading scale of 5 units, corresponding to no pain, mild pain, some pain, severe pain and very severe pain. This grading was accompanied by modified Wong-Baker FACES Pain Rating Scale to allow the participants to have better understanding of the scale.

Patients who had surgical complication leading to prolongation of surgery time were excluded from the study. Patients not cooperating in maintaining desired ocular direction after speculum insertion were persuaded to do so and if it appeared that they possibly will not oblige then a superior rectus traction suture was passed to keep the eye rotated in desired direction for exposing superior limbs.

Results

There were 270 subjects included in the study with 137 (50.7%) of them being male. The average age of the patients was 62.7 years (Median 63 years, SD ± 8.4, Range 40-90 years) with normal distribution (D'Agostino-Pearson test p=0.15). One hundred and fifty five (57.4%) patients had their right eye operated. Three patients had posterior capsular tear during the surgery which was managed with no additional complication and intraocular lens was successfully implanted.

Education Status	Frequency	Percentage
Illiterate	243	90
Primary education	18	6.6
High School	9	3.3
Intermediate	0	0
Better	0	0
Total Number of subjects	270	

Table 1: Distribution of education status of subjects.

Analysis of the educational qualifications revealed that 243 subjects (90.0%) subjects were uneducated, 18 (6.7%) have had primary education and rest 9 (3.3%) had finished their high school (grade of education which includes Standards VII to X) (Table 1).

Pain scores during the surgery as reported by the subjects' averaged 1.6 units (SD ± 0.72, Range 1-3 on a scale of 1-5, median 2 units). This was not normally distributed with p<0.0001 (D'Agostino-Pearson test for normal distribution). Approximately half of the study population (49.6%) reported no pain during the surgical procedure and additional 35.2% reported mild pain, thus total ~85% patients were comfortable during the surgical procedure. None of the patients reported severe or very severe pain.

Pain Score	Frequency	Percentage
0	134	49.62963
1	95	35.18519
2	41	15.18519
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
	270	100

Table 2: Visual analog scale score distribution as reported by the subjects.

Analysis of relation between the pain perception and gender showed no differences between the males and females (p=0.92, Two tailed probability, Mann-Whitney test, Average rank of pain scores among males and females was 135.9 and 135.0 respectively).

Educational status did not have any effect on the pain perception as there was no difference between the pain perception between illiterate and literate subjects (p=0.91, Kruskal-Wallis test).

Age of the subjects and the pain perception during Manual Small Incision Cataract Surgery under topical anesthesia were insignificantly inversely related (Spearman's rho coefficient -0.08, p=0.15).

Discussion

The study aimed to evaluate the feasibility of performing Manual Small Incision Cataract Surgery under topical anesthesia using 2% lignocaine jelly as this would be of advantage to both patients and the health care delivery system.

The two main issues in switching to topical anesthesia in high volume cataract surgery are namely the effective anesthesia and safe surgery without complications. The study has demonstrated that the pain experienced by the patients is similar to what other studies involving hospital based elective cataract surgeries have demonstrated. In an earlier study comparing the pain during phacoemulsification and

Manual Small Incision Cataract Surgery under topical anesthesia [6], it was reported that approximately 95% patients had no pain or mild pain during the procedure versus our score of 85% experiencing similar discomfort. Apparently noteworthy difference may be because in our study we have used a 5 point scale and the mentioned study has used a VAS (Visual Analog Scale) measuring 10 cm.

A study by Tinnungwattana et al. [7] involving rural patients operated for cataract at peripheral camp under deep topical anesthesia has demonstrated similar efficacy of topical anesthesia for ECCE (Extra Capsular Cataract Surgery).

Gender, educational status and the age of patients had no significant relation to pain perceived by the subjects during the surgery under topical anesthesia. Though, older patients reported somewhat less pain when compared to younger patients, which is expected and has been reported in literature [8].

We have not included the surgeon's comfort/difficulty during the surgery. This can be worth investigating if there is any difference in cooperation levels with respect to education status, age, and rural residence.

We have not studied the advantages which topical anesthesia can provide in terms of economy, man power efficiency, safety of anesthesia delivery (when compared to injection anesthesia), patient friendliness and preferences (no needle prick, immediate visual gain, no patch) and postoperative care, as the study intended to demonstrate the practicability of topical anesthesia in high volume cataract surgery involving patients from rural background with low literacy rates. These issues can be studied by comparing the topical anesthesia against conventional local injection anesthesia in high volume cataract surgery so that the superior technique may be used as standard for such surgeries.

The present study highlights that it is feasible to conduct high volume cataract surgery under topical anesthesia with acceptable patient comfort and low adverse surgical events. In addition there is no relation between the pain perceived during the procedure and gender or education status or age.

References

1. Murlikrishnan R, Krishna PR, Thulasiraj RD, Bachani D, Gupta S, Murthy GS (2005) Blindness estimations, projections and service delivery.
2. Vision 2020: The Right To Sight. Plan of Action. National Programme for Control of Blindness, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India.
3. Jongsareejit A, Wiriyaluppa C, Kongsap P, Phumipan S (2012) Cost-effectiveness analysis of manual small incision cataract surgery (MSICS) and phacoemulsification (PE). *J Med Assoc Thai* 95: 212-220.
4. Gupta SK, Kumar A, Kumar D, Agarwal S (2009) Manual small incision cataract surgery under topical anesthesia with intracameral lignocaine: study on pain evaluation and surgical outcome. *Indian J Ophthalmol* 57: 3-7.
5. Gupta SK, Kumar A, Agarwal S (2010) Cataract surgery under topical anesthesia using 2% lignocaine jelly and intracameral lignocaine: is manual small incision cataract surgery comparable to clear corneal phacoemulsification? *Indian J Ophthalmol* 58: 537-540.
6. Gibson SJ, Helme RD (2001) Age-related differences in pain perception and report. *Clin Geriatr Med* 17: 433-456, v-vi.
7. Gupta SK, Kumar A, Agarwal S (2010) Cataract surgery under topical anesthesia: Gender-based study of pain experience. *Oman J Ophthalmol* 3: 140-144.
8. Tinnungwattana U, Gorvanich S, Kulvichit K, Tulvatana W (2009) Combined deep topical and superior subconjunctival anesthesia for extracapsular cataract extraction in a rural eye camp. *Anesth Analg* 109: 2025-2027.