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# **ORIGINAL ARTICLE**

# Comparison of peribulbar anesthesia with either 0.75% ropivacaine or a mixture of 0.5% bupivacaine and 2% lidocaine for vitreoretinal surgery

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## ABSTRACT:

Background: Vitreoretinal surgery is a specialized type of eye surgery that focuses on treating disorders related to the vitreous and retina, two critical eye components. The present study was conducted to compare peribulbar anesthesia performed with either 0.75% ropivacaine or a mixture of 0.5% bupivacaine and 2% lidocaine for vitreoretinal surgery. Materials & Methods:60 patients scheduled for vitreoretinal surgery of both genderswere divided into 2 groups of 30 each. In group, patients received peribulbar anesthesia with 8 mL of either 0.75% ropivacaine and in group II, a 1:1 mixture of 2% plain lidocaine and 0.5% plain bupivacaine. Parameters such as duration of surgery time (min), onset time of sensory and motor blocks, etc. were recorded. The degree of pain was recorded at 1 hour, 6 hours and 24 hours. Results: There were 16 males and 14 females in group I and 15 males and females in group II. ASA physical status (I/II) was 7:23 in group I and 11:19 in group II. The mean weight was 68.4 kgs in group I and 70.1 kgs in group II. The mean age was 54.2 years in group I and 56.8 years in group II patients. The difference was significant (P < 0.05). The mean duration of surgery time (min)was 80.1 and 89.4, the onset time of sensory blocks (min) was 5.4 and 5.1 and the onset time of motor blocks (min) was 10.2 and 8.3 in group I and II respectively. The difference was significant (P< 0.05). At 1 hour no pain was seen in 12 and 8, mild pain in 8 and 11, moderate pain in 6 and 5 and severe pain in 4 and 6 patients. At 6 hours, no pain in 10 and 7, mild in 11 and 10, moderate in 7 and 8 and severe in 2 and 5 patients. At 24 hours, no pain was seen in 6 and 2, mildpain in 13 and 10, moderate pain in 11 and 15 and severe pain in 0 and 3 patients in group I and II respectively. The difference was significant (P< 0.05). Conclusion: 0.75% ropivacaine alone was found to be better than lidocainewhen performingperibulbar anesthesia for vitreoretinal surgery.

Key words: lidocaine, peribulbar anesthesia, Vitreoretinal surgery

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### **INTRODUCTION**

Vitreoretinal surgery is a specialized type of eye surgery that focuses on treating disorders related to the vitreous and retina, two critical eye components.<sup>1</sup> The vitreous is a gel-like substance that fills the central part of the eye, and the retina is the light-sensitive tissue lining the back of the eye. Vitreoretinal surgery often addresses conditions that can lead to vision loss or impairment.<sup>2</sup> In vitrectomy, the surgeon removes the vitreous gel and replaces it with a clear solution. This allows access to the retina for the treatment of various conditions.Procedures such as pneumatic retinopexy or scleral buckle may be used to reattach the retina.In cases of epiretinal membrane or macular hole, the surgeon may peel away the abnormal tissue to improve vision.<sup>3</sup>

Both retrobulbar and peribulbar blocks offer a secure and efficient anesthetic for ophthalmic surgery. Although peribulbar blocks have a potentially better safety margin than retrobulbar blocks, some practitioners still choose the latter because it produces anesthesia more quickly and consistently. In our facility, a 1:1 combination of lidocaine and bupivacaine is frequently utilized to extend postoperative analgesia and achieve a quick onset of both motor and sensory blocking.<sup>4</sup>

Compared to bupivacaine, ropivacaine is less hazardous to the central nervous system and the heart.<sup>5</sup> There are no clinical trials on ropivacaine used for peribulbar block during vitreoretinal surgery, despite numerous studies showing its effectiveness in various regional anesthesia procedures.<sup>6</sup>The present study was conducted to compare peribulbar anesthesia performed with either 0.75% ropivacaine or a mixture of 0.5% bupivacaine and 2% lidocaine for vitreoretinal surgery.

#### **MATERIALS & METHODS**

The present study consisted 60 patients scheduled for vitreoretinal surgery of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. After a routine preoperative evaluation, all patients were premedicated with 0.1 mg/kgoral diazepam 1 hour before the surgical procedure. Patients were divided into 2 groups of 30 each. In group, patients received peribulbar anesthesia with 8 mL of either 0.75% ropivacaine and in group II, a 1:1 mixture of 2% plain lidocaine and 0.5% plain bupivacaine. Parameters such as duration of surgery time (min), onset time of sensory and motor blocks, etc. were recorded. The degree of pain (by using a 5-points verbal rating score: 0- no pain, 1-mild pain, 2moderate pain, 3-severe pain, 4-unbearable pain) was recorded at 1 hour, 6 hours and 24 hours. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

# RESULTS Table I Distribution of patients

Parameters	Group I (30)	Group II (30)	P value
M:F	16:14	15:15	0.81
ASA physical status (I/II)	7:23	11:19	0.04
Weight (kgs)	68.4	70.1	0.93
Age (years)	54.2	56.8	0.97

Table I shows that there were 16 males and 14 females in group I and 15 males and females in group II. ASA physical status (I/II) was 7:23 in group I and 11:19 in group II. The mean weight was 68.4 kgs in group I and 70.1 kgs in group II. The mean age was 54.2 years in group I and 56.8 years in group II patients. The difference was significant (P < 0.05).

# **Table II Comparison of parameters**

Parameters	Group I	Group II	P value
duration of surgery time (min)	80.1	89.4	0.52
onset time of sensory blocks(min)	5.4	5.1	0.74
onset time of motor blocks(min)	10.2	8.3	0.01

Table II, graph I show that the mean duration of surgery time (min) was 80.1 and 89.4, the onset time of sensory blocks (min) was 5.4 and 5.1 and the onset time of motor blocks (min) was 10.2 and 8.3 in group I and II respectively. The difference was significant (P < 0.05).

# **Graph I Comparison of parameters**



# Table III Verbal rating scale

Time	VRS	Group I	Group II	P value
1 hour	No	12	8	0.59
	Mild	8	11	
	Moderate	6	5	
	Severe	4	6	
6 hours	No	10	7	0.01
	Mild	11	10	
	Moderate	7	8	

	Severe	2	5	
24 hours	No	6	2	0.72
	Mild	13	10	
	Moderate	11	15	
	Severe	0	3	

Table II show that at 1 hour no pain was seen in 12 and 8, mild pain in 8 and 11, moderate pain in 6 and 5 and severe pain in 4 and 6 patients. At 6 hours, no pain in 10 and 7, mild in 11 and 10, moderate in 7 and 8 and severe in 2 and 5 patients. At 24 hours, no pain was seen in 6 and 2, mild pain in 13 and 10, moderate pain in 11 and 15 and severe pain in 0 and 3 patients in group I and II respectively. The difference was significant (P < 0.05).

### DISCUSSION

An ideal local anesthetic agent used for intraocular surgery must have a rapid onset with an adequate duration of action, to permit a painless and movement-less surgery, while not prolonging the akinesia.<sup>7,8</sup> Ropivacaine is a newer amino-amide local anesthetic which is synthesized as a pure levoenantiomer, and is reported to provide good anesthesia with motor block and also has lesser cardiovascular effects compared with bupivacaine.9,10 The present study was conducted to compare peribulbar anesthesia performed with either 0.75% ropivacaine or a mixture of 0.5% bupivacaine and 2% lidocaine for vitreoretinal surgery.

We found that there were 16 males and 14 females in group I and 15 males and females in group II. ASA physical status (I/II) was 7:23 in group I and 11:19 in group II. The mean weight was 68.4 kgs in group I and 70.1 kgs in group II. The mean age was 54.2 years in group I and 56.8 years in group II patients. Gioia et al<sup>11</sup> found that surgical block was achieved after 8 min in the lido-bupivacaine group and after 10 min in the ropivacaine group. A 3-mL supplemental injection 15 min after block placement was required in 6 patients in the lido-bupivacaine group (20%) and in 10 patients in the ropivacaine group (33%) due to inadequate motor block (P 5 0.38). On postoperative day 1, 26 patients in the ropivacaine group (87%) reported no pain at the verbal rating score, compared with 18 patients in the lido-bupivacaine group (60%). We found that the mean duration of surgery time (min) was 80.1 and 89.4, the onset time of sensory blocks (min) was 5.4 and 5.1 and the onset time of motor blocks (min) was 10.2 and 8.3 in group I and II respectively. We observed that at 1 hour no pain was seen in 12 and 8, mild pain in 8 and 11, moderate pain in 6 and 5 and severe pain in 4 and 6 patients. At 6 hours, no pain in 10 and 7, mild in 11 and 10, moderate in 7 and 8 and severe in 2 and 5 patients. At 24 hours, no pain was seen in 6 and 2, mild pain in 13 and 10, moderate pain in 11 and 15 and severe pain in in group I and and 3 patients 0 Π respectively. Seidenari et al<sup>12</sup> evaluated the efficacy and clinical effects of local retrobulbar anesthesia using ropivacaine in vitreoretinal surgery. The operations were divided into three groups, depending on the degree of anesthesia needed. Group A: Vitrectomies with episcleral procedures (208 vitrectomies for detached retina or perforating

trauma). Group B: Episcleral procedures only (410 operations for detached retina without vitrectomy). Group C: Vitrectomies without episcleral surgery (301 operations for macular pucker or hole, proliferative diabetic retinopathy, or silicone oil removal). Swelling of lids was seen in 885 patients (96%); in 21 (2%) swelling was partial. In 13 patients (1%) there were no signs of infiltration. The motor block was total in 801 (87%) eyes, while 118 (12%) had reduced ocular movements. The degree of anesthesia was as follows, considering the three groups together: no pain = 855 (93%) patients; moderate pain = 44 (4%) patients; very strong pain = 20 (2%) patients. No adverse events or side effects were observed.

The limitation of the study is the small sample size.

#### CONCLUSION

Authors found that 0.75% ropivacaine alone was found to be better than lidocaine when performing peribulbar anesthesia for vitreoretinal surgery.

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