

# Peritonsillar Infiltration of Ropivacaine and Pain Control in Immediate Postoperative Period Following Tonsillectomy Surgery in Adult Patients

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## ABSTRACT

### Introduction

To study about the efficacy of Peritonsillar infiltration of Ropivacaine and pain control in immediate postoperative period following tonsillectomy surgery in adult patients.

### Methods

80 patients were included in the study of age 18 to 50 years. After informed consent, patients were divided into two groups. In Group R 0.5%Ropivacaine with 1:100000 Adrenaline and in Group C 0.9%normal saline with 1:100000 Adrenaline was injected into the tonsillar fossa following tonsillectomy. Surgery duration, blood loss, time to demand for 1<sup>st</sup> analgesia, analgesic consumption in 24 hours, and VAS score in 1hr,2hr,4hr,6hr,12hr,24hr were noted.

### Results

We observed significant pain control during first 4 post-operative hours with Value of <0.01, <0.01 and 0.019 respectively in first, second and fourth post-operative score. We also observed significant difference in the time for first analgesia request in two groups with the study group requesting for first analgesic at 518±175 postoperative minutes and control group at 132±47.95 postoperative minutes (P value <0.01). Total analgesia requirement was 61±22.48 in the study group and 102±27.84 in control group (P value < 0.01).

### Conclusions

It is concluded that intraoperative Peritonsillar infiltration of Ropivacaine causes analgesia in the immediate postoperative hours with the decrease in the requirement of analgesia in the first 24 postoperative hours. It is therefore recommended to use it in adult patient undergoing Tonsillectomy.

**Keywords:** analgesia; peritonsillar infiltration; postoperative pain.

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## INTRODUCTION

Tonsillectomy surgery is one of the most common surgeries among ENT procedures.<sup>1</sup> Post-operative pain and bleeding remain the commonest complications during post-operative period.<sup>2,3</sup> Post tonsillectomy pain hinders with mastication, swallowing and increases duration of hospital stay and decreases patient satisfaction.<sup>4,5</sup> Multiple interventions has been tried for postoperative pain control like topical and local infiltrations of local anesthetic agents, Intravenous NSAIDs, local and systemic steroid or opioid injections and so on.<sup>1,6,7</sup>

Pain pathway of tonsillectomy includes lesser palatine branch of trigeminal nerve and glossopharyngeal nerve that form a tonsillar plexus in the tonsillar fossa. Tonsillectomy surgery leads to local tissue injury with release of inflammatory mediators to activate C fibers transmitting pain.<sup>8</sup> Local anesthetic agent act to inhibit the activation and transmission through C fibers.<sup>9</sup> Ropivacaine is an amide local anesthetic agent with long duration of action that acts by blocking influx of sodium ion in nerve fibers.<sup>9-11</sup> It has significantly less cardio and neuro-toxicity when compared with common local anesthetic agent Bupivacaine with similar duration of action.<sup>10,11</sup>

## METHODS

This is a case control study. This study was conducted in department of Oto-Rhino-Laryngology and Head and Neck surgery, College of Medical Sciences, Bharatpur, from first June 2018 to 31<sup>st</sup> May 2019. Sample size was calculated based on previous studies assuming a standard deviation of 0.25 in VAS score with an Alfa error of 0.05 and Beta error of 0.13. 80 adult patients scheduled for tonsillectomy surgery were enrolled in the study after obtaining informed written consent. Patients were matched according to their age and gender.

Patients with severe comorbidities (American Society of Anesthesiologist Physical status more than 2), those under chronic analgesic treatment, those with known allergy to study drugs and those who did not consent for study were excluded from the study. Approval for the study was obtained from ethical committee of the hospital. Pre anesthetic checkup was done a day prior to the surgery. Patients were made aware about Visual Analog Scale (VAS) score graded from zero to ten points where 0 represented no pain and 10 represented worst imaginable pain, during that period.

Following standard premedication and monitoring, induction of anesthesia was done using 0.02 mg/kg midazolam, 1.5mg/kg fentanyl, 2mg/kg propofol and 0.1mg/kg Vecuronium; intubation was done using adequate size flexometalic endotracheal tube and maintained with Oxygen, Isoflurane and intermittent doses of vecuronium. Intravenous paracetamol 15 mg /kg was given before the incision. Inj ondansetron 4mg was given to all patients before extubation. Patients were randomized into two groups each of 40 participants either to receive 0.5% Ropivacaine with 1:100,000 adrenaline (prepared by mixing 6 ml of 0.5% Ropivacaine and 60 mcg adrenaline) in the study group (Group R), or 0.9% normal saline with 1:100,000 adrenaline (prepared by mixing 6ml of normal saline and 60 mcg adrenaline) in the control group (Group C). Convenient sampling technique was used. Drug preparation was done by the involved anesthesiologist and gave to the surgeon after the completion of surgery, according to the group after randomization. Patients were kept in the Rose position and with Boyle-Davis mouth gag, tonsillectomy was done using dissection and snare technique. After the completion of tonsillectomy, study drugs were injected in the tonsillar fossa in the fanning technique starting from apex to cover

whole of the fossa, 3 ml in each side. Time of injection of drugs was noted. After obtaining adequate hemostasis, neuromuscular blockade was reversed with 0.1mg/kg neostigmine and 0.02mg/kg glycopyrrolate. After adequate reversal and following standard extubation protocol, extubation was done and patient was shifted to post anesthesia recovery unit and then to post-operative ward after 2 hours.

Surgery duration, blood loss, any postoperative complications, time to demand of first analgesia, total analgesia consumption during first 24 hours, VAS score at 1 hour, 2 hour, 4 hour, 6 hour, 12 hour and 24 hours postoperative period were noted. Rescue analgesia was given as ketorolac 30 mg IV when VAS score was 5 or more.

Statistical analysis was performed using Microsoft Excel and SPSS Version 20. The mean and standard deviations were calculated for demographic variables. Data was analyzed using Student T test. A P value of less than 0.05 was considered statistically significant.

## RESULTS

Study was done in total 80 patient consisting 41 female and 39 male patients (22 female and 18 male in study group and 19 female and 21 male in control group). Patients were comparable regarding demographic variables like age and sex. It is observed significant pain control during first 4 post-operative hours with P value of <0.01, <0.01 and 0.019 respectively in first, second and fourth postoperative VAS score. However no difference seen regarding VAS score taken on 6<sup>th</sup>, 12<sup>th</sup> and 24<sup>th</sup> hour postoperatively (P values 6<sup>th</sup> hour 0.53, 12<sup>th</sup> hour 0.28 and 24<sup>th</sup> hour 0.36). We observed significant difference in the time for first analgesic request in two groups with the study group requesting for first analgesic at 518±175 postoperative minutes and control group at 132±47.958 postoperative minutes (P value <0.01). It is also observed significant

increased analgesic requirement during first 24 hours in control group. Total analgesic requirement was 61±22.48 mg in study group and 102±27.846 mg in control group (P value <0.01). Duration of surgery and estimated total blood loss were similar in both groups. No significant intraoperative or postoperative complications in either group was noted.

## DISCUSSION

Post-operative pain is considered as one of the main concern of patients presenting for any kind of surgical procedures.<sup>5</sup> Inadequate pain control remains the main factor for delayed recovery and prolonged hospital stay with direct impact on patients' wellbeing and satisfaction.<sup>3,5</sup> Local anesthetic agents has long been in use for intraoperative and postoperative pain management.<sup>2,7</sup> Various studies have been done with the aim of using local anesthetic agents for peritonsillar infiltration pre operatively and postoperatively for control of postoperative pain.<sup>1,2,4,8</sup> Postoperative pain control following pre surgery injection of local anesthetic agents has been tried with variable results in many studies for post-surgery control of pain.<sup>12</sup> Few studies have highlighted superiority of post-surgery injection of local anesthetic agents for control of post-operative pain when compared with pre surgery injection of local anesthetic agents.<sup>13,14</sup> In this study we tried post-surgery injection of local anaesthesia in peritonsillar fossa for management of postoperative pain.

We observed significant post-operative pain control for first 4 postoperative hours with use of local anesthetic-adrenaline solution. These group of patients demanded for first analgesic in significantly longer duration after surgery and required less analgesic in first 24 hours of surgery.

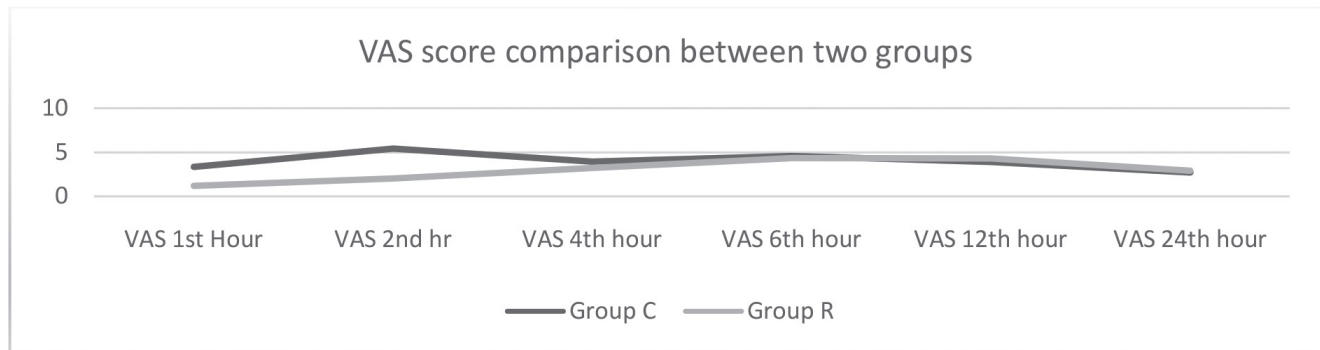
R. Ginstrom et al<sup>12</sup> and P Bhadoria et al<sup>15</sup> in their study observed significant pain control by

bupivacaine for first 6 hours and no difference thereafter in patients undergoing tonsillectomy.<sup>12</sup> Similarly U. Yusuf et al [16] and M Ozkiris et al<sup>17</sup> in different studies observed significant longer time for first analgesic requirement and low VAS score in early postoperative hours in children given local anesthetic injection in peritonsillar fossa before tonsillectomy surgery. F Kasapoglu et al observed good pain control and decreased analgesic requirement in first 24 postoperative hours after injecting local analgesic levobupivacaine in adult patients undergoing tonsillectomy surgery.<sup>8</sup>

In a study S. Moliex et al compared pre incisional and post-surgery infiltration of local anesthetic agent for control of pain in postoperative period following tonsillectomy surgeries and observed significant decrease in pain score and decreased

analgesic requirement and did not observe any difference in VAS score between pre and post-surgery groups during entire study period except 17<sup>th</sup> postoperative hour which was lower in post-surgery injection group.<sup>13</sup> Similarly A R Bameshki et al in their study has concluded that pre or post injection of local anesthetic bupivacaine adrenaline solution is effective in controlling postoperative pain and bleeding.<sup>18</sup>

W. C yao et al however did not find any difference in postoperative pain control between Ropivacaine and normal saline injected in either tonsil of same patient before or after tonsillectomy surgery.<sup>19</sup> K. A. Loy et al has recommended against use of any local anesthetic surgery in pediatric patients undergoing adenotonsillectomy surgery<sup>20</sup> Both of these studies were done in pediatric patients and the



**Figure 1.** VAS score of Group R and Group C.

**Table 1.** VAS score Group R and Group C at different times.

Variables	Group C	Group R	P value
VAS 1 <sup>st</sup> hour	3.35±1.23	1.20±1.01	<0.01
VAS 2 <sup>nd</sup> hour	5.43±0.93	2.05±0.85	<0.01
VAS 4 <sup>th</sup> hour	3.95±1.87	3.23±0.87	0.19
VAS 6 <sup>th</sup> hour	4.58±1.81	4.33±1.38	0.53
VAS 12 <sup>th</sup> hour	3.90±1.20	4.28±2.00	0.28
VAS 24 <sup>th</sup> hour	2.70±1.00	2.90±1.23	0.36
First analgesic requested	132±47.96	518±175.92	<0.01
Total analgesic required	102±22.48	61.5±22.48	<0.01

result could be due to altered pain perception or expression.

## CONCLUSIONS

Hence it is concluded that intraoperative administration of local anesthetic agent Ropivacaine decreases the immediate

postoperative pain and decreases total analgesic requirement in first 24 postoperative hours leading to a better recovery of the patient. It is therefore recommended to use Ropivacaine following tonsillectomy surgery in adult patients undergoing tonsillectomy surgery.

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