



A COMPARATIVE STUDY OF BILATERAL SUPERFICIAL CERVICAL PLEXUS BLOCK WITH BUPIVACAINE AND CLONIDINE COMBINATION VERSUS BUPIVACAINE PLAIN IN THYROID SURGERIES UNDER GENERAL ANAESTHESIA.

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ABSTRACT

As thyroid surgery is being performed as an ambulatory procedure, Anaesthesia for thyroid surgery may appear quite simple. In uncomplicated cases, surgical stimulation during dissection of the gland is gentle. It is surprising that when general anaesthesia is used, relatively deep anaesthesia is required. This is probably related to the combination of surgery and frequent tracheal stimulation associated with movements of the endotracheal tube during surgical manipulations. Deep anaesthesia for such short-lasting procedures may delay recovery. The use of short-acting opioids may appear attractive for several reasons, but postoperative hyperalgesia is a major drawback. Regional anaesthesia can be part of a multi-model treatment plan to mitigate pain. Hence the present study was done at our tertiary care centre to compare the effectiveness of clonidine to bupivacaine and bupivacaine plain in bilateral superficial cervical plexus block for thyroid surgeries in prolonging the duration of first rescue analgesia during postoperative period by Numeric Rating Scale (NRS) and compare the intraoperative fentanyl requirements based on intraoperative haemodynamic monitoring.

KEYWORDS : Anaesthesia, Thyroid Surgeries, General Anaesthesia, Regional Blocks, Cervical Plexus, Clonidine, Bupivacaine, Fentanyl, Haemodynamic Stability, Multimodal Analgesia.

INTRODUCTION

Regional anaesthesia can be part of a multi-model treatment plan to mitigate pain. Preoperatively, superficial cervical plexus block can be employed for a variety of surgical procedures. There are three main approaches to this block, and the blocks can be done using landmark techniques alone. More recently use of ultrasound has been described for performing these blocks. Deep cervical block has been associated with some serious complications, so superficial cervical plexus block is often thought to be sufficient for most procedures on the neck region. Bilateral deep cervical plexus blocks should never be performed but bilateral superficial cervical blocks can be safely performed for surgeries or for postoperative analgesia.

Superficial cervical plexus (SCP) is a sensory neural plexus formed from the ventral rami of the first four cervical nerves (C1-C4). It emerges behind posterior border of sternomastoid muscle and supplies the skin overlying the neck, ear, angle of the mandible, shoulder, and clavicle. The superficial cervical plexus block provides ipsilateral anaesthesia to the "cape" region roughly bordered by the posterior tip of the earlobe, the lateral end of the clavicle, the medial aspect of the mandible and the inferior surface of the clavicle. Cervical plexus blocks are easy to perform and provide anaesthesia for the surgical procedure in the distribution of C2 to C4. RA techniques do have some disadvantages, including risk of having local anaesthetic toxicity, spinal or epidural injections, neuropraxis, hematoma formation etc.

Adjuvants or additives are often used with local anaesthetics for its synergistic effect by prolonging the duration of sensory-motor block and limiting the cumulative dose requirement of local anaesthetics. The armamentarium of local anaesthetic adjuvants have evolved over time from classical opioids to a wide array of drugs spanning several groups and varying mechanisms of action. To prolong the postoperative analgesia, many adjuvants have been tested and tried, but the adverse effects produced by them, limit their use as adjuvant. Trials are still underway to compare the benefits and disadvantages of one adjuvant over the other. Adjuvants are the drugs that, added to local anaesthetics, enhance or prolong their action. The most commonly used are dexamethasone, opioids (morphine, fentanyl, sufentanil, methadone), α_2 adrenergic agonists (clonidine and dexmedetomidine), ketamine, and neostigmine. The addition of adjuvants causes a reduction in the dose of local

anaesthesia and minimizes the hemodynamic and neurological effects.

Bupivacaine is a well-established long-acting regional anaesthetic, which like all amide anaesthetics has been associated with cardio toxicity when used in high concentration or when accidentally administered intravascularly. Hence for moderate prolongation of analgesia (<24 h), various adjuvant drugs can be admixed with local anaesthetic.

Hence the present study was done to compare the effectiveness of clonidine to bupivacaine and bupivacaine plain in bilateral superficial cervical plexus block for thyroid surgeries in prolonging the duration of first rescue analgesia during postoperative period by Numeric Rating Scale (NRS) and compare the intraoperative fentanyl requirements based on intraoperative haemodynamic monitoring.

Aim :

To study the effectiveness of clonidine and bupivacaine combination versus bupivacaine plain in bilateral superficial cervical plexus block for thyroid surgeries, in maintaining intraoperative haemodynamic stability and prolonging the duration of first rescue analgesia post operatively.

Objectives :

- To compare the time to first rescue analgesia in postoperative period by Numeric Rating Scale (NRS)
- To compare the intraoperative fentanyl requirements based on intraoperative haemodynamic monitoring.
- To compare the perioperative side effects encountered in patients of both groups.

MATERIAL AND METHODS

A hospital based, single blinded comparative study was conducted with 50 patients to compare bupivacaine plain versus bupivacaine and clonidine combination in thyroid surgeries under general anaesthesia in bilateral superficial cervical plexus block. Patients were randomly divided into following two groups:

Group 1: 25 patients received 0.25% bupivacaine (0.3ml/kg upto 24ml total; 12ml per side).

Group 2: 25 patients received 0.25% bupivacaine with clonidine (1mcg/kg).

Study Design: A hospital based, single blinded comparative

study

Inclusion Criteria:

- Male and Female patients of age between 18-60yrs posted for thyroid surgeries under general anaesthesia.
- ASA grade 2&3
- Weight between 30 to 80 kg.

Exclusion Criteria:

- Pre existing bleeding & coagulation disorder
- ASA grade 4.
- cardiac patients
- hypertensive/ hypotensive patients.
- local inflammation
- study drug allergy
- Patient refusal.
- Huge thyroid.

Ethical Approval:

Institutional Ethics Committee B. J. Govt. Medical College Pune and Sassoon General Hospital Pune1

Certificate Reference Number: BJGMC/IEC/Pharmac/D - 1022166-166

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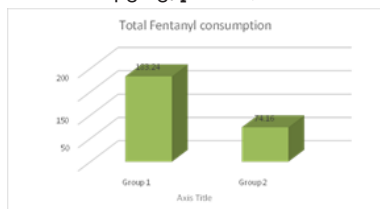
Conflicts Of Interest: No Conflicts of Interest.

Statistical Analysis

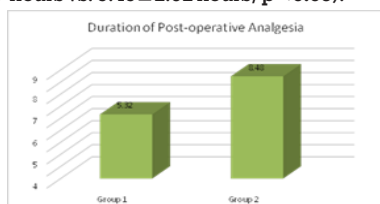
Quantitative data was represented with the help of Mean and Standard deviation. Comparison among the study groups was done with the help of unpaired t test as per results of normality test. Intragroup analysis: by Repeated measures ANOVA. Qualitative data was represented with the help of frequency and percentage table. Association among the study groups was assessed with the help of Fisher test, student 't' test and Chi-Square test. 'p' value less than 0.05 is taken as significant.

RESULTS**Distribution Of Patients According To Total Fentanyl Consumption**

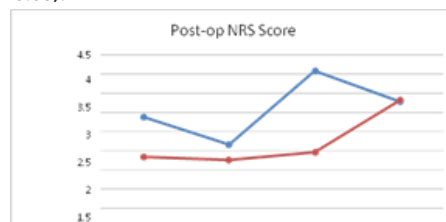
The total fentanyl consumed was significantly more in Group 1 compared to Group 2 as per Student t-test (183.24 ± 28.17 $\mu\text{g/kg}$ vs. 74.16 ± 19.49 $\mu\text{g/kg}$; $p < 0.05$).

**Distribution Of Patients According To Duration Of Post-operative Analgesia**

The duration of post-operative analgesia was significantly longer in Group 2 compared to Group 1 as per Student t-test (5.32 ± 2.27 hours vs. 8.48 ± 2.52 hours; $p < 0.05$).

**Distribution Of Patients According To Post-op Numeric Rating Scale (NRS) Score**

The post-op NRS score was significantly higher in Group 1 compared to Group 2 at post-op 30 mins (2.88 ± 1.36 vs. 1.84 ± 1.11), post-op 2 hours (2.16 ± 1.65 vs. 1.76 ± 0.93) and post-op 6 hours (4.08 ± 2.20 vs. 1.96 ± 1.06) as per Student t-test ($p < 0.05$). The NRS score was comparable between the groups at post-op 10 hours (3.28 ± 1.17 vs. 3.32 ± 1.11) as per Student t-test ($p > 0.05$).

**DISCUSSION****The Following Observations Were Noted:**

Majority of the patients (36%) in Group 1 were in the age group of 51- 60 years followed by 41-50 years (24%), 21-30 years (16%), 31-40 years (12%), 18-20 years (8%) and 61-65 years (4%). The mean age of patients was 43.16 ± 13.83 years. Majority of the patients (32%) in Group 2 were in the age group of 51-60 years followed by 21-30 years (20%), 41-50 years (20%), 31-40 years (16%), 61-65 years (8%) and 18-20 years (4%). The mean age of patients was 43.76 ± 13.23 years. There was no significant difference between the groups as per Student t-test ($p > 0.05$). Group 1 had 3 (12%) male and 22 (88%) female patients while Group 2 had 4 (16%) male and 21 (88%) female patients. There was no significant difference between the groups as per Chi-Square test ($p > 0.05$).

Group 1 had 16 (64%) patients with ASA grade I and 9 (36%) patients with ASA grade II, whereas Group 2 had 19 (76%) patients with ASA grade I and 6 (24%) patients with ASA grade II. There was no significant difference between the groups as per Chi-Square test ($p > 0.05$). The duration for surgery was comparable between the groups as per Student t-test (102.12 ± 11.34 minutes vs. 107.88 ± 18.08 minutes; $p > 0.05$).

The total fentanyl consumed was significantly more in Group 1 compared to Group 2 as per Student t-test (183.24 ± 28.17 $\mu\text{g/kg}$ vs. 74.16 ± 19.49 $\mu\text{g/kg}$; $p < 0.05$).

The duration of post-operative analgesia was significantly longer in Group 2 compared to Group 1 as per Student t-test (5.32 ± 2.27 hours vs. 8.48 ± 2.52 hours; $p < 0.05$).

The post-op NRS score was significantly higher in Group 1 compared to Group 2 at post-op 30 mins (2.88 ± 1.36 vs. 1.84 ± 1.11), post-op 2 hours (2.16 ± 1.65 vs. 1.76 ± 0.93) and post-op 6 hours (4.08 ± 2.20 vs. 1.96 ± 1.06) as per Student t-test ($p < 0.05$). The NRS score was comparable between the groups at post-op 10 hours (3.28 ± 1.17 vs. 3.32 ± 1.11) as per Student t-test ($p > 0.05$).

The incidence of side effects was more in Group 1 compared to Group 2, however this difference was statistically not significant as per Chi Square test ($p > 0.05$).

CONCLUSIONS

BSCPb with 0.25% bupivacaine with clonidine is effective in reducing both intraoperative and postoperative pain and meets the analgesic requirements for thyroidectomy.

Bupivacaine and clonidine combination in thyroid surgeries under general anaesthesia for bilateral superficial cervical plexus block is a simple and effective procedure that can be administered with 0.25% bupivacaine with clonidine (1mcg/kg) for perioperative analgesia as a part of multi-

modal approach. It provides longer duration of the analgesia with minimum incidence of side effects and very low risk of complications.

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