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OPIOID SPARING EFFECT OF BILATERIAL SUPERFICIAL CERVICAL PLEXUS BLOCK IN THYROID SURGERY POST OPERATIVE ANALGESIA

Dr.V.Thiruchelvan Senior Asst Professor Anesthesiology GVMCH (Correspondence Author)

Dr.M.Mahendran Senior Asst Professor Anesthesiology GVMCH.

Dr.R.Selvarajan Associate Professor Anesthesiology TVMCH.

ABSTRACT **Context:** Post-operative pain following thyroid surgery is intense and rapidly decreases beyond 24 hours. So we wanted to evaluate the role of Bilateral Superficial Cervical Plexus Block in pain relief in post thyroid surgical patients. **Aim:** To evaluate "the opioid sparing effect of Bilateral Superficial Cervical Plexus Block in thyroid surgery post-operative analgesia". **Methods:** Sixty adult patients posted for elective thyroid surgery were randomly divided into two groups. Group A received the block with 0.25% Bupivacaine Group, B with normal saline and the results were analyzed. **Statistical methods:** students t test and P value < 0.05 was considered statistically significant. **Results:** Group A had lesser VAS score and statistically significant reduction in pentazocine requirement. **Conclusion:** Bilateral Superficial Cervical Plexus Block has lesser pain score and statistically significant opioid sparing effect in thyroid surgery post-operative analgesia.

KEYWORDS : Bilateral Superficial Cervical Plexus Block, Thyroid surgery, Post-operative analgesia.

Introduction:

It is interesting to note that General Anesthesia for thyroid surgery requires deep plane, whereas it can be done only with mild sedation when combined with regional anesthesia [1]. It has been reported that 90% of patients required morphine in the first post-operative day [2]. This significant dose of opioid is attended with high incidences of vomiting. Therefore it appears that regional anesthesia either by bilateral superficial cervical plexus block or in combination with deep cervical plexus blocks or even wound infiltration by Local Anesthetics alone can offer tremendous benefits by decreasing the dose of opioids, lesser incidences of vomiting and earlier discharge. It is surprising to note that superficial and deep cervical plexus block appear to be equally effective [3]. But deep cervical plexus block carries risk of serious complications like hemidiaphgramatic palsy. So we wanted to evaluate the opioid sparing effect of bilateral superficial plexus block in thyroid surgery post-operative analgesia.

Material and Methods:

After getting institutional ethical committee approval, a double blinded randomized prospective placebo controlled trial was conducted to assess the analgesic efficacy of bilateral superficial cervical plexus blocks performed at the end of thyroid surgery. Sixty adult female patients posted for elective thyroid surgery were randomly divided into two groups, group A and group B each consisting of 30 patients. Patients with h/o allergy to local anesthetics or any drugs used in the study, prolonged duration of surgery > 4 hours, bleeding diathesis, h/o consuming any other opioid or analgesics, patients who are pregnant, age less than 18 years and patients who refused were excluded from the study. All patients received Tab Diazepam 10mg and Tab Ranitidine 150 mg the night prior to and morning of surgery. Inj Ondansetron 4mg im was given to all patients prior to induction. A routine general anesthesia with 0.6 mg/kg pentazocine was conducted. If the patients required additional intraoperative opioid supplementation they were excluded from the study.

At the end of the surgery before extubation all patients underwent bilateral superficial cervical plexus block by the same Anesthesiologist who was unaware of the solution used. In Group A patients the block was given with 15 ml of 0.25% Bupivacaine in each side and group B patients with 15 ml of Normal saline in each side. 23 G short beveled needles were used to pierce at the midpoint of the posterior border of the sternocleido mastoid muscle. After piercing the investing fascia of neck [4] 5 ml of local anesthetic was injected posterior and immediately deep to the sternocleidomastoid muscle. The needle was then redirected both superiorly and inferiorly along the posterior border of sternocleidomastoid muscle [5]. 5ml of solution was injected in each of these sites. Since this block relies on volume to establish a field block of superficial cervical plexus we used 15 ml of 0.25% Bupivacaine in each side. The block was repeated in other side. Then patients were extubated and direct laryngoscopy was done to rule out vocal cord dysfunction. The patients were observed in PACU for the first 2 hours and shifted to post op ward and observed for 24 hours.

During the post-operative period all patients received Tab Paracetamol 650mg tds and Inj diclofenac sodium 50 mg intramuscularly twice daily for 24 hours. Complete analgesia was defined as a VAS score 0 and effective analgesia was defined as VAS score less than 4. If VAS score was equal to or exceeded 4, 6 mg pentazocine intravascularly was repeated every 5 minutes until VAS comes to less than 4. If intravenous pentazocine dose requirement reached 15 mg or more, the patient received 30 mg pentazocine intramuscularly. VAS score and pentazocine requirement were noted in the first 24 hours for both the groups. Complications like vomiting local anesthetic toxicity were also noted. Results were analyzed with student's t test and P value.

Results:

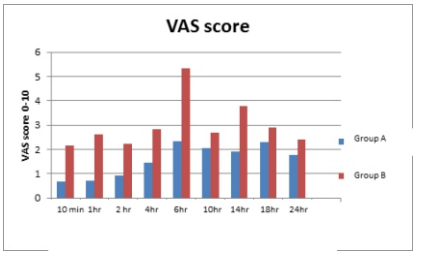
All sixty female patients enrolled completed the study. Demographics were similar in both the groups including the duration of the surgery (Table 1).

Table 1

	Bupivacaine group (mean ± SD)	Saline group (mean ± SD)	P value
Age (years)	39.3 ± 9.09	42.20 ± 7.63	0.1859 (NS)
Wt (kg)	56.53 ± 9.88	62.13 ± 12.25	0.0561 (NS)
Duration of surgery (min)	180.67 ± 35.81	181.33 ± 37.30	0.9439 (NS)

Only 15 patients out of 30 in Group A had VAS ≥ 4 and required opioid whereas in Group B 27 patients out of 30 had VAS ≥ 4 and required opioid. The group B patients had statistically extremely significant increase in pentazocine requirement (mg) in the first 24 hours (Group A Vs. Group B, 9.00 ± 10.12 Vs. 24.00 ± 10.86). The VAS score too were statistically significantly high in Group B patients. (Graph 2)

Graph 2



Discussion:

J J Pandit et al [4] by observing methylene blue dye spread in cadavers found out that injectate in superficial cervical space goes to deep cervical space, in fact the dye tracked down to brachial plexus as far as

axially sheath. These findings explained why superficial and deep cervical plexus blocks were equally effective. This negates the need for high risk deep cervical plexus block for analgesic purpose. They also insisted that during superficial cervical plexus block simple subcutaneous injection is unlikely to be clinically effective and the drug is to be injected deep to the investing fascia of neck. Injecting the drug superficially is crucial to avoid the complications associated with this block like phrenic nerve palsy or recurrent laryngeal nerve block [6]. Therefore the depth of the injection was strictly kept less than 5 mm.

In a similar study by Dieudonne et al [7], only 34 % of patients didn't require opioids in the first 24 hours and the reduction in opioid requirement was not clinically relevant in terms of reduced side effects. Whereas in our study only 50% of patients required opioids in the similar period with statistically significant reduction in opioid requirement. In a study done by Sophie et al [1] they combined both superficial and deep cervical plexus block prior to skin incision and 69% of their patients didn't require opioid in the first 24 hours. That higher success could be by a combination with deep cervical plexus block or by the addition of clonidine in their study or by the preemptive action of block administered before skin incision. In a similar study by G Andrieu et al [6], they performed the block by using three point injection techniques. Herbland A et al [8] in their study reported that bilateral superficial cervical plexus block did not prevent post-operative pain after thyroidectomy even with 0.75% Ropivacaine. This failure of analgesic effect might be attributed to their two point injection technique and because Ropivacaine has 40 to 45% reduced potency when compared with Bupivacaine[9]. Eti Z et al [10] in their study concluded that bilateral superficial cervical plexus block or wound infiltration with 0.25% bupivacaine didn't reduce analgesic requirement or pain scores for thyroid surgery patients. This failure may be because of the dilute concentration of local anesthetics used without any additives like clonidine or adrenaline. A significant dose response relationship has been reported with the concentration of local anesthetic used and the analgesic effect [11]. The success in our study could be attributed to the effective three point injection technique with 15 ml of volume on each side especially after piercing the investing fascia of neck. G Andrieu et al [6] in their study had greatest reduction in analgesic requirement when clonidine was added. This analgesic efficacy of clonidine may be explained by its central action or by its direct action on local nerve fibers.

These studies illustrate that the success of the bilateral superficial cervical plexus block strongly depends on the drug used, its concentration, usage of any additives and more importantly effective technique. Using higher concentration of Local Anesthetics or adding additives like clonidine or adrenaline is likely to improve the analgesic efficacy. G Andrieu et al [6] in their study noted that 48% patients in saline group had severe pain with VAS $\geq$6 and the intensity of this pain significantly waned within 24 hours. In our study we observed similar events with 56% of patients. This shorter duration of severe pain can be effectively managed by good regional anesthesia. Gozal Y et al [2] reported that even wound infiltration with 0.5% Bupivacaine can effectively reduce VAS score and post-operative morphine requirement.

Conclusion:

We conclude that Bilateral Superficial Cervical Plexus Block given at the end of the thyroid surgery provides excellent analgesia and has significant opioid sparing effect. We suggest that Bilateral Superficial Cervical Plexus Block is to be used as an essential component of multimodal approach in thyroid surgery post-operative analgesia.

References:

1 Sophie Aunac MD, Marieanne Carlier MD, Francois Singelyn MD Phd, and Marc De kock MD Phd. The analgesic efficacy of bilateral combined superficial and deep cervical plexus block administered before thyroid surgery under general anesthesia. Anesth Analg 2002, 95; 746-50.

2 Gozal Y, Shapira SC, Gozal D, Magora, P. Bupivacaine wound infiltration in thyroid surgery reduces postoperative pain and opioid demand. Acta Anaesthesiol Scand 1994; 38: 813-5.

3 Stoneham MD, Doyle AR, Knighton JD, Dorje P, Stanley JC. Deep or superficial cervical plexus block for carotid endarterectomy. Anesthesiology 1998; 89: 907-12.

4 J J Pandit, D Dutta and J F Morris. Spread of injectate with superficial cervical plexus block in humans. An anatomical study. British Journal of Anaesthesia 91(5): 733-5 (2003).

5 David L.Brown, M.D, Cervical plexus block In: Atlas of Regional Anesthesia 1992 by W.B Saunders Company Page 170-1

6 G Andrieu, H, Amrouni, E.Robin, B Carnaille, J.M Wattier, F.Pattou, B Vallet and G Lebuffe. Analgesic efficacy of bilateral superficial cervical plexus block administered before thyroid surgery under general anesthesia. Br J Anesth 2007; 99; 561-6.

7 Nathalie Dieudonne, Alexandra Gomola, Philippe Bonnichon and Yves M., Ozier. Prevention of Postoperative pain after thyroid surgery: A double-blind randomized study of bilateral superficial cervical plexus blocks, Anaesth Analg, 2001; 92: 1538-42.

8 Herbland A, Cantini O, Reynier P, et al. The bilateral superficial cervical plexus block with 0.75% Ropivacaine administered before or after surgery does not prevent postoperative pain after total thyroidectomy. Reg Anesth Pain Med 2006; 31:34-9.

9 Capogna G, Celleno D, Fusco P, et al. Relative potencies of bupivacaine and ropivacaine for analgesia in labour. Br. J. Anaesth 1999: 82: 371-3.

10 Eti Z, Irmark P, Gulluoglu BM et al. Does bilateral superficial cervical plexus block decrease analgesic requirement after thyroid surgery? Anesth Analg 2006; 102; 1174-6

11 Moiniche S, Mikkelsen S, Wettersly J, Dahl JB. A qualitative systematic review of incisional local anesthesia for postoperative pain relief after abdominal operations. Br J Anaesth 1998; 81: 377-83.