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Ultrasound Guided Bilateral Superficial Cervical Plexus Block Plus Tolerable Endotracheal Tube Versus Conventional Systemic Analgesia for Thyroid Surgeries

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ABSTRACT

Background: There is still debate over the use of regional anesthesia during thyroid surgeries.
Objective: This investigation looked at the effectiveness of an ultrasound-guided bilateral superficial cervical plexus block (BSCPB) combined with a tolerable endotracheal tube (TET) for reducing hemodynamic stress response and respiratory issues as well as controlling pain during and after surgery.
Methods: This prospective randomized controlled comparative clinical research was performed at the Department of Anesthesia, Surgical Critical Care and Pain Control in Zagazig University Hospitals. Patients were split into two groups: Group I (Control group, "C") where patients received general anesthesia with classic endotracheal tube (ETT) and systemic analgesia. Group II ("BSCPB+TET" "B") patients got ultrasound guided BSCPB then general anesthesia with TET. **Results:** Postoperative cough, bronchospasm, and sore throat were substantially distinct between the tested groups statistically. Group B had significantly less cough than group C. None of patients in group B had postoperative bronchospasm compared to 22.22% of patients in group C. Group B had significantly lower sore throat than group C
Conclusions: The use of BSCPB with TET in thyroid surgeries can achieve intraoperative hemodynamic stability, increase time for 1st analgesic request, decrease total dose of intraoperative and postoperative analgesic requirements and reduce the frequency of postoperative difficulties in patients undergoing elective thyroid surgeries.
Keywords: Thyroid Surgeries, BSCPB, TET.

INTRODUCTION

Mild to severe incisional discomfort might be a side effect of thyroid surgery. Additionally, difficulties in swallowing, throat burning, nausea, and vomiting that might be brought on by the surgical procedure or by general anesthetic. Most people experience them, particularly on the first day after surgery [(1)].

With a variety of methods, including opioids and non-steroidal anti-inflammatory medicines (NSAIDs), or with additional loco-regional anesthetic approaches, surgeons and anesthesiologists have sought to avoid or cure these issues. Patients who underwent thyroid procedures may benefit from the use of loco-regional anesthetic techniques including bilateral superficial cervical plexus blocks (BSCPB) and local anesthetic wound infiltration (LWI) in order to lessen both intraoperative and postoperative discomfort [(2)].

The area of the anterior triangle of the neck has been anesthetized using a regional block of the superficial cervical plexus, which covers the dermatome grade of the second to fourth cervical nerves on the anterolateral section of the neck [(3)].

It is intended that a bilateral superficial cervical plexus nerve block (BSCPB) may lower postoperative pain's intensity and analgesic usage [(4)].

The transverse cervical, larger auricular, lesser occipital and supraclavicular nerves may be made surface-numb by using this popular regional anesthesia ultrasound-guided procedure, which involves bilateral injections of local anesthetic medications near the lateral border of the sternomastoid muscle [(5)].

TET is an ETT plus a nelaton catheter of 6- or 8-gauge size that has been burned and clamped closed at its tip. It is then punctured with a small needle, such as a 23G, and tightened by a thread, such as surgical silk, along the tube's lesser curvature with its closed end at the tracheal tip of the endotracheal tube [(6)].

The aim of the present research was to investigate the effectiveness of ultrasound-guided BSCPB plus TET for intraoperative and postoperative pain control and minimizing hemodynamic stress response and respiratory problems like coughing, bronchospasm and sore throat, which were associated with extubation process in thyroid surgeries.

PATIENTS AND METHODS

This prospective randomized controlled comparative clinical research was performed at the Department of Anesthesia, Surgical Critical Care and Pain Control in Zagazig University Hospitals.

Patient groups were split into two: Group I (Control group) "C" patients receive general anesthesia with ETT and systemic analgesia. **Group II "BSCPB+TET" "B"** patients got ultrasound guided BSCPB then general anesthesia with TET.

Inclusion criteria: Patients with ASA I and ASA II, mallampati score I, II, age > 21 years old, body mass index < 35, accepted mental state and undergoing thyroid surgery whose pathology and surgical intervention suppose at least a 24 hours hospital admission.

Exclusion criteria: Patients with opioids treatment before surgery, history of pathology or surgery

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involving the larynx or trachea, disturbed conscious level, hypersensitivity to any of the study's medications, cardiac, renal or hepatic impairment and thyrotoxicosis.

All Patients were subjected to the following:
All participating patients were interviewed preoperatively during their preoperative preparation. Special care has been paid during the physical exam to record vital signs, heart and chest conditions, and to rule out contraindications. All patients have been investigated by complete blood count, hepatic functions test, renal functions test and coagulation profile.

Patient preparation: Prior to surgery, all patients were maintained on a 6-hour fast. During the preoperative phase, all patients had clinical examinations, routine investigations were reviewed, and the whole process was discussed. During the preoperative appointment, the ten-centimeter visual analogue scale (VAS), which ranges from 0 (no pain) to 10 (the worst agony conceivable) was discussed**.**

Procedure:
In the induction room: Before transferring patients to the operating room, the anesthetist secured an 18-gauge cannula and administered midazolam 0.05 mg/kg intravenously to each patient. Standard monitoring equipment such as an electrocardiogram (ECG), noninvasive blood pressure monitoring, and pulse oximetry were then installed.

Group (**B**):
BSCPB was performed firstly before general anesthesia to ensure the success of block by ultrasound-guided bilateral injection by using a 6- to 12 MHz linear US probe (SonoSite) placed in a sterile sheath and using the in-plane technique. A 22-gauge needle was placed into the middle of the posterior border of the sternocleidomastoid muscle, 1-2 cm deep, between the landmarks of the mastoid process and C-6 transverse process, and administer 10 ml of 0.5% bupivacaine to each side, the patient is lying on his back with his head turned toward the other side of the block.

Through an intermediate fascial technique, 3.5 ml each were injected superiorly and inferiorly along the sternocleidomastoid muscle's posterior border. The remaining 3 ml was injected just below the muscle's midway. The first indication of nerve blockage is a loss in feeling in the region where the affected cervical plexus component is distributed. The beginning of action for this block is between 10 and 15 minutes. Failed block cases were removed from this study.

After three minutes of pre-oxygenation, general anesthesia was induced in the patients with the induction drug propofol (2–2.5 mg/kg), then cisatracrium (0.15–0.2 mg/kg), after verifying that the patients could breathe on their own to enable tracheal intubation. All patients have received appropriate anesthetic utilizing isoflurane MAC (1–1.5), tidal volume (8–10 ml/kg) ventilation, respiratory rate adjustments to keep patients normocapnic (32–36 mmHg), and cisatracrium (0.03 mg/kg) to maintain the ulnar N train of four at less than 2 of 4.

Patients were intubated using the modified TET with 7.5 ID in males and 7 ID in females. After insertion of the tube, pilot balloon was inflated and the proper position was confirmed by the equality of air entries. The patient was then manually ventilated for 5-7 times to create air bubbles in the upper airway after having their head lifted to a position of 20 degrees and the pilot balloon was deflated. Pilot balloon was reinflated with the least amount of occlusion volume possible to stop air leaks (volume at which the trachea is not palpably leaky). This was repeated 15 min prior to anticipate extubation.

Group C:
Patients were administered the same medications plus intravenous fentanyl (1 ug/kg), and they were intubated utilizing the standard ETT with a 7.5 ID for men and a 7 ID for women.

Post-operative:
The oropharynx was gently suctioned after the procedure. When the train-of-four peripheral nerve stimuli produced three to four twitches, the muscle relaxant was reversed with a dosage of (combination of atropine 0.02 mg/kg and neostigmine 0.05 mg/kg). Inhalational oxygen was then raised to 100% while waiting for the restoration of spontaneous breathing.

After meeting the following requirements:
The patient is prepared for extubation after complete reversal of the neuromuscular block and spontaneous breathing.

HR and BP (systolic, diastolic and mean BP) were measured as base line and 5 min thereafter till extubation, immediately after extubation, HR and BP were measured at 3 min and 5 min to compare with baseline values. Cough is rated utilizing a three-category scoring system if it is present.

The prevalence and degree of sore throat were assessed at 1 hr and 24 hrs postoperatively where:

All the patients received diclofenac sodium (75mg/12 h). A visual analogue scale (where 0 cm equals no pain and 10 cm equals the greatest agony possible) was used to measure postoperative pain immediately after surgery as well as at 2, 4, 6, and 12 hours later. Tramadol has been administered to patients whose VAS score was higher than 3 (For pain, use 50–100 mg orally every 4–6 hours as necessary).

Discharge criteria will be assessed by Aldrete Scoring System. Patients are deemed fit for transfer or discharge to the next stage of recovery when they get a total score of 9 out of 10.

Ethical Approval:
The study was approved by the Ethics Board of Zagazig University and the patients were given all

the information they need about the trial. An informed written consent was taken from each participant in the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical Analysis

Data analysis was carried out using IBM-SPSS version 24. (May 2016). The statistical significance was assessed using the logistic regression analysis, Spearman's correlation, Kristall-Wallis, and Wilcoxon tests. Each variable was evaluated according to the kind of data it contained (parametric or not). We considered the results statistically significant if the P-values were less than 0.05.(5% of everything) :

RESULTS

There was no substantial variation for the distribution of BMI or ASA, and age between the two groups (table 1).

Table (1): Demographic distribution of the study groups

Variables	Group C (N=18)	Group B (N=18)	Test of sig.	P
Age (years)	37.7 ± 5.7	33.1 ± 8.0	1.9	0.06
Weight (kg)	74.58±16.13	76.69±17.66	0.945	0.331
Height (cm)	161.63±11.23	159.65±14.25	0.874	0.411
BMI	24.28±4.71	23.95±3.02	2.354	0.124
ASA (N)(%): I П	 12(66.66%) 6(33.33%)	 13(72.22%) 5 (27.77%)	2.28	0.31

Since group B had a reduced mean arterial pressure than group C throughout the trial, there was a very statistically substantial variation in mean arterial pressure between the analyzed groups (Table 2).

Table (2): Mean arterial pressure in the studied groups

MAP (mmHg)	Group C (N=18)	Group B (N=18)	T	P
Before induction	91.3 ± 6.8	90.7 ± 9.9	1.3	**0.3**
Immediately after intubation	111.5 ± 5.4	91.8 ± 6.5	9.8	**<0.001**
15 min after intubation	99.2 ± 7.1	84.8 ± 5.5	6.7	**<0.001**
30 min after intubation	93.7 ± 5.3	81.8 ± 8.4	5.1	**<0.001**
45 min after intubation	96.7 ± 8.5	80.1 ± 6.9	6.5	**<0.001**
60 min after intubation	93.4 ± 8.2	79.5 ± 5.9	5.9	**<0.001**
75 min after intubation	88.7 ± 5.0	77.0 ± 5.0	6.9	**<0.001**
90 min after intubation	92.4 ± 6.2	75.9 ± 4.7	8.9	**<0.001**
At time of extubating	111.4 ± 5.5	86.9 ± 5.7	13.1	**<0.001**
5 min after extubating	94.4 ± 3.3	88.4 ± 5.7	3.9	**<0.001**
15 min after extubating	92.6 ± 5.4	91.8 ± 4.6	0.96	**0.5**

Heart rate differences across the tested groups were extremely statistically substantial, with group B consistently having a reduced HR than group C (Table 3).

Table (3): Heart rate in the studied groups

HR (beat/min.)	Group C (N=18)	Group B (N=18)	T	P
Before induction	71.3 ± 5.2	70.8 ± 5.1	1.1	**0.32**
Immediately after intubation	94.1 ± 4.0	75.9 ±5.6	11.1	**<0.001**
15 min after intubation	80.3 ± 3.0	69.3 ±5.0	8.0	**<0.001**
30 min after intubation	77.5 ± 3.8	69.3 ±5.6	5.1	**<0.001**
45 min after intubation	81.7 ± 6.1	67.6 ±5.7	7.2	**<0.001**
60 min after intubation	76.8 ± 5.5	67.4 ±4.5	5.5	**<0.001**
75 min after intubation	74.6 ± 3.0	65.3 ± 4.8	6.8	**<0.001**
90 min after intubation	77.8 ± 4.5	64.6 ±5.1	8.2	**<0.001**
At time of extubating	95.9 ± 4.1	73.4 ± 3.8	17.1	**<0.001**
5 min after extubating	80.3 ± 3.8	69.2 ±4.4	8.1	**<0.001**
15 min after extubating	71.6 ± 6.7	69.6 ±4.9	5.7	**0.19**

VAS at rest was substantially lower among group B immediately postoperative and at 2 hours till 24 hours after surgery compared to the other control group (Table 4).

Table (4): Visual Analogue Scale during rest at different times among the two studied groups

	Group C (N=18)	Group B (N=18)	MW	P
Immediately postoperative	4.0(1-6)	1(0-2)	4.3	<**0.001**
VAS 2h	3.0(1-5)	0(0-1)	5.0	<**0.001**
VAS 4h	3.0(1-5)	1.0(0-2)	3.9	
VAS 6h	4.0(2-5)	0(0-1)	5.1	<**0.001**
VAS 12h	3.0(2-4)	1.0(1-2)	4.8	<**0.001**
VAS 24h	4.0(3-5)	2.0(1-3)	3.4	<**0.001**

VAS during cough was substantially lower among group B immediately postoperative and at 2 hours till 24 hours after surgery compared to the other control group (Table 5).

Table (5): Visual Analogue Scale during cough at different times among the two studied groups

	Group C (N=18)	Group B (N=18)	MW	P
Immediately postoperative	5.0 (3-6)	2(1-2)	4.6	<**0.001**
VAS 2h	4.0(3-5)	1.0(1-2)	5.0	<**0.001**
VAS 4h	4.0(2-5)	2.0(1-3)	3.9	
VAS 6h	4.0(2-6)	1.0(1-2)	4.5	<**0.001**
VAS 12h	4.0(3-5)	2.0(1-3)	3.8	<**0.001**
VAS 24h	4.0(3-5)	2.0(1-3)	3.4	<**0.001**

As regards the time to the first analgesic demand, it was substantially longer in B group compared to the C group (p <0.001) (table 6 & figure 1). Also, group B had substantially the lower dose of intraoperative fentanyl consumption than group C (p <0.001). Patient satisfaction and total postoperative tramadol use substantially differed between groups B and C in group B (p <0.001) (table 6).

Table (6): The duration to the first analgesic request, total intraoperative fentanyl dose, total postoperative tramadol dose and patient satisfaction in the study groups

			Group C (N=18)	Group B (N=18)	X^2	P
The time to the first analgesic request (h)			3.12±0.45	11.06 ±1.33	275.35	<0.001
Total intraoperative fentanyl dose (mic)			103.2±24.8	0.0	103.74	<0.001
Total postoperative tramadol dose (mg)			71.24±27.17	0.0	71	<0.001
Patient satisfaction (Scale from 0 to 10) (As 0= no satisfaction 10= full satisfaction)	Not (0-3)	N	8	1	31.25	<0.001
		%	44%	5.55%		
	Average (4-7)	N	7	5		
		%	38.8%	27.77%		
	Good (8-10)	N	3	12		
		%	16.6%	66.66%		

There was a statistically substantial variation in post-surgery cough, bronchospasm, and sore throat between the examined groups. Group B had significantly less cough than group C. None of patients in group B had postoperative bronchospasm compared to 22.22% of patients in group C. Group B had significantly lower sore throat than group C (Table 7).

Table (7): Distribution of Postoperative complications in the study groups:

		Group C (N=18)	Group B (N=18)	X^2	P
Cough	N	14	3	14.1	0.001
	%	77.77%	16.66%		
Bronchospasm	N	0	4	fisher	0.003
	%	0.0%	22.22%		
Sorethroat	N	15	5	16.2	<0.001
	%	83.33%	27.77%		

DISCUSSION

In the current research, the ability to spray local anesthesia through the TET and create air bubbles with manual ventilation to anesthetize the surrounding mucosa of the upper airway above, along, and below the endotracheal tube cuff and replicate the same method 15 min before anticipated extubation can be used to explain why group B reveals less attenuation of hemodynamic response (HR, MAP) during extubation. As a result, the upper trachea, larynx, pharynx, and mouth mucosa have been topicalized (anesthetized) as opposed to ETT, which had a considerably higher HR and MAP at the time of extubation. **Meng *et al*.** [7] When researchers looked at how topical ropivacaine anesthesia affected hemodynamic responses to extubation, they discovered that HR and MBP were substantially lesser in the ropivacaine group getting topical anesthesia with 37.5 mg ropivacaine intratracheally than in the lidocaine group getting topical anesthesia with 100 mg and saline. This may be due to ropivacaine's longer half-life than lidocaine's, which may have shortened the extubation time. Also, the present results are in agreement with study of **Hong *et al*.** [8] who reported that L group received, to lessen the airway reaction and hemodynamic response at the period of extubation, 1% lidocaine at a dose of 0.5 mg/kg may be administered safely and efficiently by endotracheal intubation.

The tube tolerance in B group as compared to C group may be used to explain the considerable drop in HR at the pre extubation measurement in B group. The existence of surgical pain and tube reaction, which may maintain BP high, may be the cause of the C group's substantial rise at extubation time.

This study showed that patients undergoing thyroid surgery who received bilateral superficial cervical plexus blocks with general anesthesia using TET experienced less pain and required fewer painkillers both during and after their procedures than those who only got general anesthesia using the traditional ETT. In this research, all BSCPB were performed as part of multi-modal analgesia during the preoperative period under US guidance, just prior to induction. Preemptive analgesia and reduced anesthetic duration may result from this.

Anatomical planes may shift during surgery, making it easier for fluid to flow through face layers and incisions [9]. Some surgeons expressed concern about the block's disturbance of the operative anatomy [10]. According to surgeons' judgments in different research, the surgical circumstances were excellent and there were no issues [11].

The VAS scale was used as the technique of pain evaluation in this research because it is sensitive and straightforward. This research discovered that group B scores postoperatively were considerably lower than those of the C group when comparing the median VAS ratings of patients. In research conducted by **Kale *et al*.** [9] Three groups of 60 thyroidectomy patients were created: those who got no blockade, those who received bilateral BPCS blockage during the preoperative period, and those who received bilateral BPCS blockade after surgery. The three groups' VAS ratings (0–10) were assessed at rest, while the neck moved, and during speaking and swallowing. The groups who got blocks in the first 48 hours had the lowest VAS scores, whereas the groups that did not get blocks had the highest. It was observed that the bilateral blockade of the BPCS done before or after surgery significantly decreases the pain of patients after thyroidectomy and the need for opioids.

Patients who had general anesthesia with traditional systemic analgesia experienced moderate to severe postoperative pain that needed to be managed with opioids. In the current research, group B considerably consumed less postoperative tramadol than did group C. **Tekgul *et al*.** [12] also assessed how using the bilateral BPCS blockade affected the requirement for tramadol throughout the postoperative period. The blocking group required less tramadol than the control group, according to the researchers, who used three-point procedures to administer 10 mL of 0.5% levobupivacaine bilaterally.

The present study showed significantly lower time for the first analgesic request in patients of group B compared to patients in group C. These results are in accordance with that of **El-Taleb *et al*.** [13] who reported that in the control, wound infiltration, and BSCPB groups, the times until the first analgesia were 162 ± 124 min vs 544 ± 320 min vs 860 ± 59 min, respectively. Compared to our findings, its analgesic duration was relatively lengthy. The fact that they used 15 ml of 0.5% bupivacaine while the present research utilized 10 ml of 0.5% bupivacaine suggests that this discrepancy may be related to medication dosage.

The current research demonstrated that spraying 10 ml of 0.5% bupivacaine through the TET tube right after intubation and again 15 minutes before extubation reduced coughing at extubation by 83.3% with fully awake patients following instructions and even self-extubating. This was explained by spraying LA to the trachea, larynx, pharynx, and mouth mucosa. The results of the present work are in line with study of **Diachun *et al*.** [14] who were suggesting that before extubation using the LITATM tube, topical lidocaine was applied to the laryngotracheal airway to minimize coughing. Specifically in 75% of conscious patients who can respond to verbal orders to open their eyes or clasp their hands, 2 mg/kg of 4% lidocaine applied topically 30 min before expected extubation reduced coughing. Additionally, it stopped 64% of awake patients who could elevate their heads on command from coughing.

In the current research, sore throat scoring was absent in 72.2% of patients after extubation in group B using topical bupivacaine 7 ml 0.5% administered via the TET tube. **Hong *et al*.** [8] reported that in comparison with the N group getting intratracheal placebo, the lidocaine group receiving 1% lidocaine 0.5 mg/kg had a reduced

prevalence of sore throats. Unlike **Crerar *et al.*** [15] who in contrast to the 2 mL of 2% lidocaine (40 mg) with 3 mL to 7 mL of 8.4% sodium bicarbonate administered into the ETT cuff before intubation, it was discovered that the LITA group had a greater prevalence of sore throat (71%), which was noted 30 minutes before extubation. The tracheal membrane regions that are in indirect touch with the ETT cuff may not get enough local anesthetic if lidocaine is applied through the LITA tube while the cuff is inflated, which might lead to an insufficient nociceptor blockage.

In the present study, there was substantial variation between the patients of these two groups as regards incidence of extubation spasm (bronchospasm). Nearly 83% of control group experienced variable degrees of bronchospasm. The surgical site and the mass of gland may contribute to this significant difference in control group in comparison with study group. But in study of **Jee and Park,** [16] who reported that there are no patients experienced extubation spasm in all the groups (spraying lidocaine (1mg / kg 2%) down the tracheal tube.

CONCLUSION

This study found that the use of BSCPB with TET in thyroid surgeries can achieve intraoperative hemodynamic stability, increase time for 1st analgesic request, decrease total dose of intraoperative and postoperative analgesic requirements, increase patient's satisfaction and decrease the incidence of postoperative complications as cough, bronchospasm and sore throat in patients undergoing elective thyroid surgeries.

DECLARATIONS

- **Consent for publication:** I attest that all authors have agreed to submit the work.
- **Availability of data and material:** Available
- **Competing interests:** None
- **Funding:** No fund
- **Conflicts of interest:** no conflicts of interest.

REFERENCES

1. **Karthikeyan V, Sistla S, Badhe A *et al.* (2013):** Randomized controlled trial on the efficacy of bilateral superficial cervical plexus block in thyroidectomy. Pain Practice, 13 (7): 539-546.
2. **Santosh B, Mehandale S (2016):** Does dexmedetomidine improve analgesia of superficial cervical plexus block for thyroid surgery? Indian Journal of Anaesthesia, 60 (1): 34.
3. **Shih M, Duh Q, Hsieh C *et al.* (2010):** Bilateral superficial cervical plexus block combined with general anesthesia administered in thyroid operations. World journal of surgery, 34 (10): 2338-2343.
4. **Gürkan Y, Taş Z, Toker K *et al.* (2015):** Ultrasound guided bilateral cervical plexus block reduces postoperative opioid consumption following thyroid surgery. Journal of clinical monitoring and computing, 29 (5): 579-584.
5. **Kessler J, Moriggl B, Grau T (2014):** Ultrasound-guided regional anesthesia: learning with an optimized cadaver model. Surgical and radiologic anatomy: SRA., 36 (4): 383–392.
6. **Hokoma M, Nofal O, Medhat M (2022):** Tolerable endotracheal tube, Academy of Scientific Research and Technology (ASRT): Patency no, 26322. DOI:10.21608/zumj.2020.23346.1718
7. **Meng Y, Cui G, Gao W *et al.* (2014):** Local airway anesthesia attenuates hemodynamic responses to intubation and extubation in hypertensive surgical patients. Medical Science Monitor: International Medical Journal of Experimental and Clinical Research, 20: 1518.
8. **Hong S, Ji S, Lee J *et al.* (2019):** The effect of endotracheal 1% lidocaine administration to reduce emergence phenomenon after general anesthesia. Anesthesia and Pain Medicine, 14 (2): 152-157.
9. **Kale S, Aggarwal S, Shastri V (2015):** Evaluation of the analgesic effect of bilateral superficial cervical plexus block for thyroid surgery: a comparison of presurgical with postsurgical block. Indian Journal of Surgery, 77 (3): 1196-1200.
10. **Restrepo C, Tubbs R, Spinner R (2015):** Expanding what is known of the anatomy of the spinal accessory nerve. Clin Anat., 28: 467–71
11. **Suh Y, Kim Y, In J *et al.* (2009):** Comparison of analgesic efficacy between bilateral superficial and combined (superficial and deep) cervical plexus block administered before thyroid surgery. European Journal of Anaesthesiology (EJA), 26 (12): 1043-1047.
12. **Tekgul Z, Gonullu M, Simsek E *et al.* (2012):** Retrospective evaluation of the efficacy of superficial cervical block on the postoperative use of tramadol in thyroid surgery under general anesthesia. Turkiye Klinikleri Tip Bilimleri Dergisi, 32 (2): 394-398.
13. **El-Taleb S, Nagi M, Al-Mansoury A *et al.* (2016):** Two different approaches for prevention of post-thyroidectomy pain: local wound infiltration versus bilateral superficial cervical plexus block. Libyan J Surg., 4: 1-11.
14. **Diachun C, Tunink B, Brock-Utne J (2001):** Suppression of cough during emergence from general anesthesia: laryngotracheal lidocaine through a modified endotracheal tube. Journal of clinical anesthesia, 13 (6): 447-451.
15. **Crerar C, Weldon E, Salazar J et al. (2008):** Comparison of 2 Laryngeal Tracheal Anesthesia Techniques in Reducing Emergence Phenomena. AANA journal, 76 (6): :425-31.
16. **Jee D, Park S (2003):** Lidocaine sprayed down the endotracheal tube attenuates the airway-circulatory reflexes by local anesthesia during emergence and extubation. Anesthesia & Analgesia, 96 (1): 293-297.