Adding Two Doses of Dexmedetomidine in Bilateral Superficial Cervical Plexus Block for Thyroidectomy

Original Article

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ABSTRACT

Background: A variety of localized procedures are utilized during anterior neck surgeries, with the cervical fascia being the primary site of involvement. When dexmedetomidine is added to bupivacaine, bilateral superficial cervical plexus block (BSCPB) guided by ultrasound (US) may produce longer-lasting analgesia.
The study's objectives are to assess the quality of postoperative analgesia with US-guided BSCPB utilizing two distinct dosages of dexmedetomidine (50 µg and 100 µg) combined with bupivacaine.
Patients and Methods: Three equal groups of 75 healthy patients, ages 18 to 70 years, both sexes, with ASA I-II (scheduled for thyroidectomy under general anesthesia), were randomly assigned. Group BD50 received US-BSCPB with 20 ml (18ml 0.5% bupivacaine with 50 µg diluted dexmedetomidine in 2 ml saline); group BD100 received US-BSCPB with 20ml (18ml 0.5% bupivacaine with 100 µg diluted dexmedetomidine in 2 ml saline). Group B received US-BSCPB with 20 ml (18 ml 0.5% bupivacaine + 2 ml saline). All the three groups received the block immediately after induction and stabilization of general anesthesia. A postoperative Visual Analogue Scale (VAS) was the primary outcome. Intraoperative hemodynamics, the time of the first analgesic rescue, the total dose of postoperative analgesics, nausea, and vomiting were the secondary outcomes.
Results: Group BD100 had a significantly lower post-operative VAS and a longer mean time of the first analgesic rescue (P<0.001) than groups BD50 and B. Also, there was reduced postoperative nausea and vomiting in both groups receiving dexmedetomidine.
Conclusion: The quality of analgesia with manageable side effects was improved and the duration of postoperative analgesia for BSCPB was prolonged by the addition of 100 µg dexmedetomidine to bupivacaine.

Key Words: Bupivacaine, dexmedetomidine, superficial cervical Plexus, thyroidectomy.

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INTRODUCTION

Globally, thyroid diseases are becoming more prevalent[1]. The primary suggested course of treatment is either a partial or complete thyroidectomy[2]. Thyroidectomy patients still endure pain (including incision site pain, posterior neck pain, and occipital headache), discomfort, and postoperative nausea & vomiting (PONV) despite the procedure taking only a short while[1].

An essential component of perioperative care is postoperative analgesia. An effective analgesic after surgery can enhance the surgical outcome. Opioids, non-steroidal anti-inflammatory medications (NSAIDs), local anesthetic, or regional anesthesia are among the major modalities used to treat surgical pain[3].

Opioids used in the ward can have several negative side effects that are detrimental to recovery after thyroid surgery, including sleepiness, respiratory depression, nausea, and vomiting (which can cause dislodgement of the sutures in the neck)[4].

In this context, regional blocks are being employed more frequently, with excellent results. Thyroidectomy patients frequently undergo bilateral superficial cervical plexus block (BSCPB), a common regional anesthetic[5]. Numerous research investigations have indicated that BSCPB enhances intraoperative pain management, minimizes the quantity of general anesthetic medications needed for thyroidectomy, and lessens the intensity of postoperative pain[5-7]. Both the traditional landmark (LM) approach and US guidance can help with this surgery, but US guidance offers real-time visualization of anatomical features and needle movement, which lowers the risk of numerous problems[7].

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Adrenergic receptor (AR) agonist dexmedetomidine specifically activates the alpha-2 adrenoreceptor. It has a low risk of causing respiratory depression and is used as a sedative, analgesic, and anti-anxiety drug[8]. Furthermore, research has demonstrated that local administration of dexmedetomidine, a nerve-blocking anesthetic, can stabilize hemodynamics, increase the duration of the nerve block, and enhance the analgesic impact following surgery[9].

In the current study, we block the superficial cervical plexus with Bupivacaine and two doses (50 and 100 µg) of dexmedetomidine, comparing their effects on postoperative analgesia.

PATIENTS AND METHODS

The Menoufia Faculty of Medicine's ethical committee (IRB 6/2020ANESTH8) approved the study methods in accordance with the Declaration of Helsinki. All the study's participants gave their approval and signed informed consent forms after being fully informed about the study's purpose, goals, and methodology before recruitment. 75 patients between the ages of 18 and 70 years who had a Body Mass Index (BMI) of ≤ 35 kg m2 and an American Society of Anesthesiology Physical Status (ASA) of I–II for both sexes were included in this prospective, randomized, double-blind study. They were scheduled for a thyroidectomy under general anesthesia and were receiving care at Menoufia University Hospitals between May 2020 and December 2022. Exclusion criteria included the patient's unwillingness to participate in the study, an infection at the injection site, a history of prior known allergy to any medication used in the study, abnormalities in the heart's conduction system, renal or hepatic disease, patients who were uncooperative or mentally unstable, coagulopathy or anticoagulant therapy, and pregnancy. Using sealed envelopes, they were randomly divided into three groups at random, with 25 patients in each group. Group B consisted of 25 patients who had bilateral superficial cervical plexus block using ultrasound guidance and 20 ml (18 ml of 0.5% bupivacaine plus 2 ml of saline). Group BD50 consisted of 25 patients who underwent bilateral superficial cervical plexus block using ultrasound guidance and 20 ml (18 ml 0.5% bupivacaine + 50 µg diluted dexmedetomidine (with concentration of 200µg/2ml) in 2 ml saline) and Group BD100, which consisted of 25 patients who underwent anesthesia induction and 20ml (18ml 0.5% bupivacaine + 100 µg dexmedetomidine (with concentration of 200µg/2ml) diluted in 2 ml saline) with ultrasound-guided bilateral superficial cervical plexus block.

The anesthetic method and the various pain management techniques were explained to each patient. Additionally, participants received instruction on how to use the VAS to register pain after surgery. Participants were told to mark on the scale from 0 to 10 cm at the point where 0 they felt no pain at all and 10 the worst pain they could experience. Intravenous access was secured in the operating room under aseptic condition, and all patients were under constant observation for non-invasive arterial pressure, capnography, oxygen saturation, and heart rate (HR).

General anesthesia was standardized for all patients in all groups. After preoxygenation, fentanyl (1µg/kg), propofol (2 mg/kg), and atracurium (0.5 mg/kg) were injected intravenously to induce general anesthesia and enable endotracheal intubation. Volume-controlled ventilation utilizing isoflurane 1 minimum alveolar concentration (MAC) was used to maintain the general anesthesia while maintaining a 6 ml/kg tidal volume, I: E 1/2, with variable frequency to sustain end-tidal CO2 (ETCO2) value between 32 and 36 mmHg. The anesthesia was maintained by a combination of isoflurane and atracurium (0.1 mg/kg every 20 minutes). The patients received their calculated IV fluid requirements (for fasting, maintenance, and loss) during the surgery.

Following the end of the general anesthesia induction, patients received a superficial cervical plexus block (SCPB) while lying supine.

In aseptic conditions, with the head tilted to contra side for the bilateral block. The lateral and anterior regions of the neck were sterilized. Short, beveled needles measuring 80 mm and 22 gauge (Stimuplex D needles; B. Braun, Melsungen, Germany) were used for each block, and a linear multifrequency 10-14 MHz transducer scanning probe with a Sono Site M Turbo (Sono Site, Bothell, WA, USA) was used. The ultrasound transducer's directional marker was medial, and the ultrasound screen was contralateral to the physician. At the level of the midpoint of the line joining the mastoid process with the sternal head insertion of the sternocleidomastoid muscle (SCM), the transducer was positioned in a transverse plane on the anterior neck. The objective was to position the needle point just below the SCM's tapering posterolateral edge and above the levator scapulae muscle, then guide it from a lateral to a medial orientation. The LA injection (10 ml each side) (18 ml of 0.5% bupivacaine + dexmedetomidine diluted in 2 ml of saline with varying doses according to the groups) should be visualized following a negative aspiration test.

At the end of the procedure, 100% oxygen was provided to the patients and the isoflurane was switched off.

IV neostigmine 0.04 mg/kg combined with atropine 0.02 mg/kg was used to reverse the neuromuscular blockade when the patient showed full criteria (a train of four ratio greater than or equal to 0.9).

a. Heart rate (HR), mean arterial blood pressure (MBP), and arterial oxygen saturation (SaO2) were measured as baseline values prior to induction, following general anesthesia induction (prior to block administration), following block completion, and every 15 minutes until the procedure was completed. A 20% drop in blood pressure from the starting point was known as intraoperative

hypotension, and it was managed with decrease MAC and intravenous ephedrine (starting with incremental dose of ephedrine 2.5mg and asses every 2mins). Intravenous atropine (0.01 mg/kg) was used to treat bradycardia, which is defined as a heart rate that is less than 50 beats per minute. An extra dosage of fentanyl (0.5µg/kg IV) was given when the intraoperative systolic arterial pressure or heart rate increased by 20% above the baseline values. It was noted how many patients required ephedrine, and/or atropine, as well as how much of each was administered overall. The visual analog pain scale (VAS) was used to measure the primary outcome, which was post-operative pain: Every 0.5 hour after discharge from the post-anesthetic care unit (PACU) for the following two hours, every 2 hours for the following six hours, and every 6 hours for the final twenty-four hours following surgery. Time to first analgesia request (when VAS is ≥4): All the patients are given an IV infusion of 1 gram of paracetamol every 6 hours and 75 mg of intramuscular diclofenac every 8 hours at the first 24hours. If VAS was ≥4, the analgesia technique was maintained using a 2.5 mg of morphine intravenously. The time to first rescue analgesia and the total amount of opioid analgesics (morphine) consumed in the first 24 hours following surgery were recorded. Every 12 hours following surgery, patients' satisfaction with analgesia was assessed using a 5-point Likert scale[10] (0 being weak, 1 being moderate, 2 being good, 3 being very good, and 4 being excellent). The incidence of complications such as bradycardia, hypotension, and PONV was also recorded. PONV is generally influenced by multiple factors that are related to the patient, surgery and anesthesia. Pain and usage of opioids are the most common causes for PONV. Also, female gender, nonsmoking status, hypoxia, hypotension and neostigmine may increase the risk of PONV. Management is done by injection of 4mg of ondansetron intravenously when patient complains of nausea or vomiting.

Sample size estimation

Based on information from a prior study by Ghazaly *et al*.[11], PASS 13 is used to calculate the sample size. The sample size for a one-way ANOVA study was determined to be 20 patients per group, whose means were to be compared. With a significance level of 0.05, the entire sample of 60 patients has 80% power to identify differences of 20% between the means of the VAS score and standard deviation. Each group will have 25 patients to make up for any missing data.

Statistical Analysis

Using Microsoft Excel 2019 and the SPSS V.25 application for Microsoft Windows 10, the results were collected and statistically examined using a standard computer program. For quantitative data, the data was described using mean±SD, and for qualitative data, frequency, and percentage. The Shapiro test was used to check the normality of quantitative data. When comparing normally distributed variables, the ANOVA test was employed, while for non-parametric variables, the Kruskal-Walli's test (K) was utilized. A post-hoc analysis was then conducted to ascertain any differences between the groups. The study employed a chi-square ($\chi 2$) test to compare several qualitative characteristics.

RESULTS

(Figure 1) displays a flowchart of the research population. Out of the 92 patients, 75 were willing to participate in the study and were split into the study groups; the remaining 17 patients were removed from the study (9 patients rejected consent and 8 patients did not match the inclusion criteria).

Regarding age, sex, or ASA, there was no statistically significant difference between the groups under study (Table 1). At 60, 75, 90, 105, and 120 minutes, the intraoperative heart rate measurements were considerably lower in groups BD100 and BD50 than in group B (P<0.05), with a significant difference between the former groups. Furthermore, between groups BD50 and BD100, the intraoperative mean arterial blood pressure at 30, 45, 60, 75, 90, 105, and 120 m was significantly lower than group B (P<0.05), with a significant difference between BD50 and BD100 groups (Figure 2).

Postoperative VAS was considerably lower in group BD100 than in groups B and BD50 (P<0.05) after 30 minutes, 1 hour, 1.5 hours, 2 hours, 4 hours, 6 hours, 12 hours, 18 hours, and 24 hours. (Table 2).

In relation to this, group BD100 had a significantly longer mean time of first rescue analgesic (808±404.1) min than groups BD50 (235.2±140) min and B (78.6±34.45) min, with a statistically significant difference between the groups under study. Furthermore, compared to group B, the BD100 and BD50 groups required less total postoperative morphine (P <0.001). Additionally, the BD100 group's postoperative morphine demand was less than that of the BD50 group (Table 3).

With a statistically negligible difference in patient satisfaction scores between the groups BD50 and BD100, patients in those groups reported higher levels of satisfaction than those in group B (P<0.001). (Table 4).

Compared to groups BD50 and B, group BD100 saw a higher frequency of controllable adverse effects as shown in (Table 5). In group BD100, five patients had bradycardia and required medical care with atropine (P<0.05), while fifteen patients suffered hypotension (P<0.001). Seven of them were given 2.5 mg of ephedrine, while the other eight patients required 5 mg. Only one patient had hypotension and bradycardia, which was treated with a mix of atropine and ephedrine (P>0.05). Also, table 5 shows that there was no statistically significant difference (P=0.131) in the number of patients who experienced postoperative nausea and vomiting between the BD100 group (7 patients), BD50

group (10 patients), and the B group (14 patients). Between the study groups, the arterial oxygen saturation was similar, and there were no instances of desaturation (SpO2 < 90%) (Figure 3).

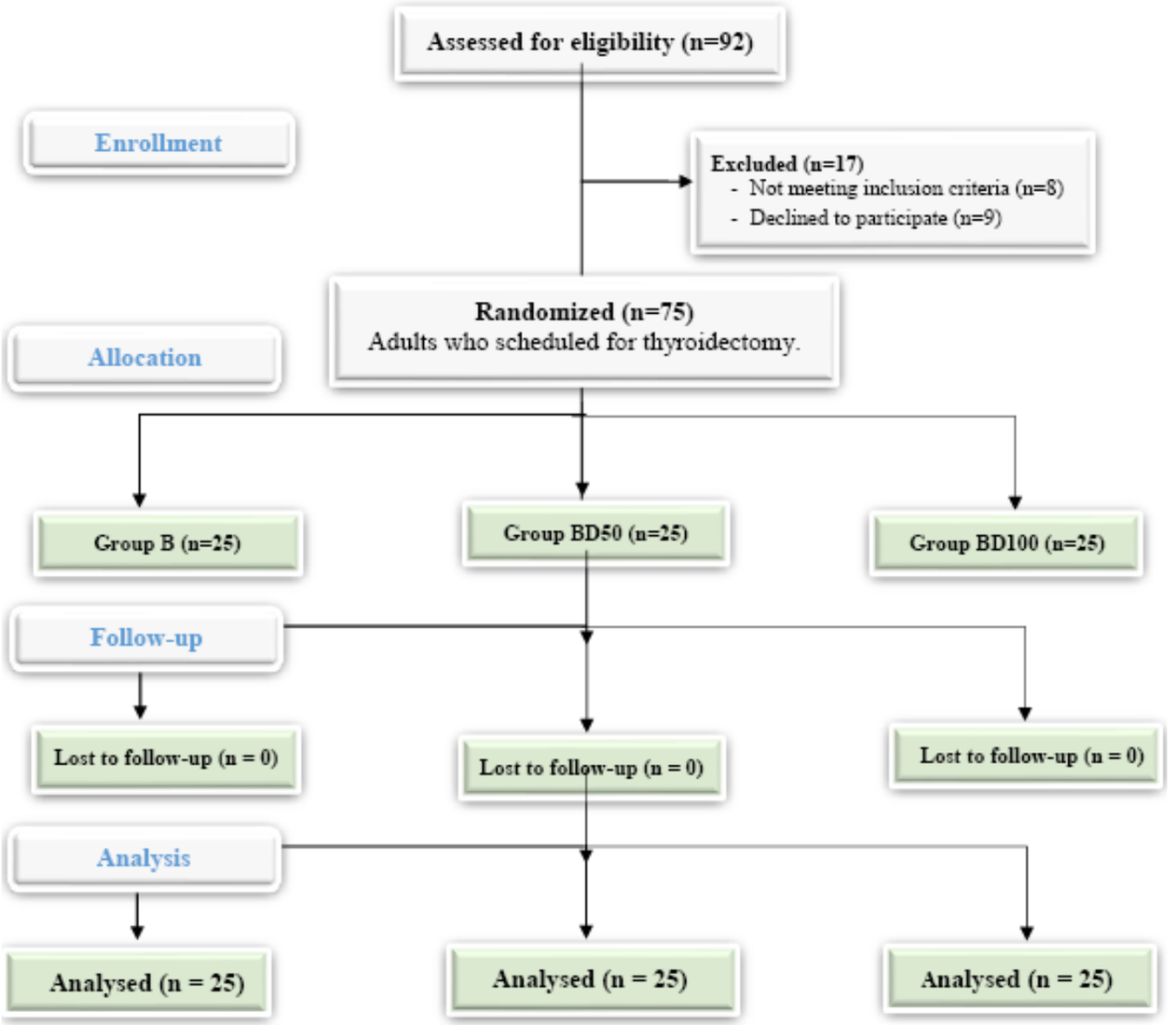

Fig. 1: Study Flowchart of adults

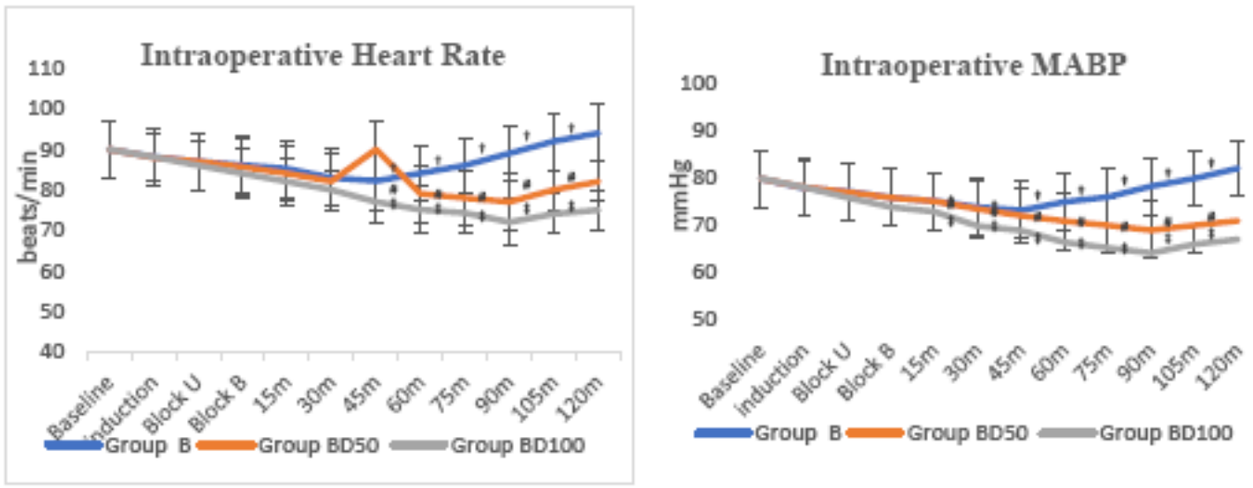

Fig. 2: Intraoperative HR and MAB. Data are presented as median (interquartile rang). † *P* <0.05 was considered statistically significant between-group B & group BD50, ‡ *P* <0.05 was considered statistically significant between-group B & group BD100, # *P* <0.05 was considered statistically significant between-group BD50 & BD100. Lines are mean values and error bars are SD. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine).

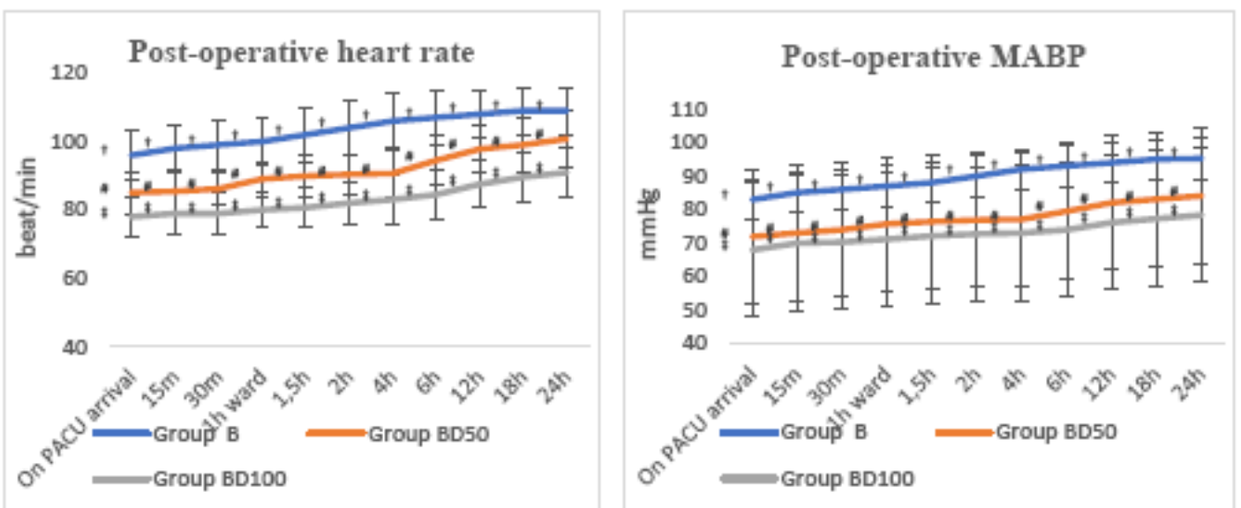

Fig. 3: Postoperative HR and MAB. Data are presented as median (interquartile range). † *P* <0.05 was considered statistically significant between-group B & group BD50, ‡ *P* <0.05 was considered statistically significant between-group B & group BD100, # *P* <0.05 was considered statistically significant between-group BD50 & BD100. Lines are mean values and error bars are SD. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine)

Table 1: Demographic data and ASA score.

	Group B (n=25)	Group BD50 (n=25)	Group BD100 (n=25)	*P-value*
	Mean± SD	Mean± SD	Mean± SD	
Age(year)	46.9 13.4±	45.5 13.9±	43.8 12.8 ±	0.712
Sex				
Male	9 (36.0%)	6 (36.0%)	5 (20.0%)	0.120
Female	16 (64.0%)	19 (64.0%)	20 (80.0%)	
ASA				
I	16 (64.0%)	17 (68.0%)	20 (80.0%)	0.433
II	9 (36.0%)	8 (32.0%)	5 (20.0%)	

Data are presented as mean ±SD or number of patients (%), ASA: American Society of Anesthesiology. * (P <0.05) was considered statistically significant between the 3 groups, n: number of patients. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine).

Table 2: Postoperative VAS score among the studied groups.

	Group B (n=25)	Group BD50 (n=25)	Group BD100 (n=25)	*P-value*
	Mean± SD	Mean± SD	Mean± SD	
30m	3(3-3)†	2(2-3)‡	1(1-1)#	<0.001*
1h	4(3-3)†	3(3-4)‡	2(2-2)#	<0.001*
1.5h	4(3-3)†	3(3-4)‡	2(2-3)#	<0.001*
2h	4(4-4)†	3(3-4)‡	2(2-3)#	<0.001*
4h	5(5-5)†	3(3-4)‡	3(2-3)#	<0.001*
6h	6(5-6)†	4(4-5)‡	3(2-4)#	<0.001*
12h	6(6-6)†	5(5-6)‡	4(3-5)#	<0.001*
18h	6(6-6)†	5(5-6)‡	5(4-5)#	<0.001*
24h	6(6-6)	6(6-6)‡	5(4-5)#	<0.001*

Data are presented as median (interquartile range), n=number of patients.* P <0.05 was considered statistically significant between the 3 groups, † P <0.05 was considered statistically significant between-group B & group BD50, ‡ P <0.05 was considered statistically significant between-group B & group BD100, # P <0.05 was considered statistically significant between-group BD50 & BD100. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine

Table 3: First time to rescue analgesia among the studied groups.

	Group B (n=25)	Group BD50 (n=25)	Group BD100 (n=25)	*P-value*
1st rescue analgesia (min)	78.6 ± 34.5†	235.2 ± 140.0‡	808.0±404.1	<0.001*
Total Morphine Consumption (mg)	5.6±1.31†	4.0±1.25‡	1.3±1.46#	<0.001*

Data are presented as mean±SD, n=number of patients.* P <0.05 was considered statistically significant between the 3 groups, † P <0.05 was considered statistically significant between-group B & group BD50, ‡ P <0.05 was considered statistically significant between-group B & group BD100, # P <0.05 was considered statistically significant between-group BD50 & BD100. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine

Table 4: Patient satisfaction among the studied groups

	Group B (n=25)	Group BD50 (n=25)	Group BD100 (n=25)	*P-value*
	Median (IQR)	Median (IQR)	Median (IQR)	
12 hrs.	4(3-4)	4(4-4)	4(4-4)	<0.001*
24 hrs.	3(3-3)†	4(4-4)‡	4(4-4)	<0.001*

Data are presented as median (interquartile range), n=number of patients.* P <0.05 was considered statistically significant between the 3 groups, † P <0.05 was considered statistically significant between-group B & group BD50, ‡ P <0.05 was considered statistically significant between-group B & group BD100. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine

Table 5: Intra and postoperative side effects among the studied groups

	Group B (n=25)	Group BD50 (n=25)	Group BD100 (n=25)	*P-value*
Bradycardia	0 (0.0%)	0 (0.0%)	5 (20.0%)	0.005*
Hypotension	0 (0.0%)	0 (0.0%)	15 (60%)	<0.001*
Hypotension+Bradyacardia	0 (0.0%)	0 (0.0%)	1 (4.0%)	0.363
PONV	14 (56.0%)	10 (40%)	7 (28%)	0.131

Data are presented as number of patients (%). n=number of patients. * P <0.05 was considered statistically significant). Mean of heart rate in bradycardia =52±5. Mean arterial blood pressure in hypotension =53.3±6.1. Group B: (received 0.5% bupivacaine), Group BD50: (received 0.5% bupivacaine+ 50 µg dexmedetomidine), Group BD100: (received 0.5% bupivacaine+100 µg dexmedetomidine).

DISCUSSION

In this study, two doses (50 and 100 µg) of dexmedetomidine added to bupivacaine were compared in bilateral superficial cervical plexus block for thyroidectomy. Better analgesia was demonstrated by a lower VAS score, longer postoperative analgesia, less morphine consumption, and a higher incidence of controllable side effects (hypotension, bradycardia) when BSCBP was administered with bupivacaine and 100 µg of dexmedetomidine.

An essential component of perioperative care is postoperative analgesia. An effective analgesic after surgery can enhance the surgical result. There are several popular techniques for reducing surgery pain. Regional blocks have been employed more frequently in this context, with favorable outcomes[12].

Our study showed that, there was no statistically significant difference among the studied groups regarding intra operative mean arterial blood pressure at baseline, induction, block U, block B and 15m (P>0.05). While, intra operative mean arterial blood pressure at 30m, 45m, 60m, 75m, 90m, 105m and 120m was statistically significant lower in group BD100 and BD50 than group B, with a significant difference between BD50 and BD100 groups (P<0.05). Also, there was no significant difference among the studied groups regarding intra operative heart rate at baseline, induction, block U, block B, 15m, 30m and 45m (P>0.05). While, Intraoperative heart rate measurements at 60, 75, 90, 105, and 120 minutes were considerably lower in groups BD100 and BD50 than in group B, with a significant difference between BD50 and BD100 groups (P<0.05). In accordance with our study, a study by Ghazaly *et al*.,[11] comparing two doses of dexmedetomidine as an adjuvant to levobupivacaine in infraclavicular brachial plexus block. The study included 60 patients aged 20 to 60 years of both sex with an ASA I/II undergoing forearm and hand surgery. The patients were randomly assigned into three equal groups (n=20) for ultrasound-guided infraclavicular brachial plexus block. The L group received 35-mL 0.5% levobupivacaine plus normal saline, the LD50 group received 35-mL 0.5% levobupivacaine plus 50-µg dexmedetomidine, and the LD100 group received 35-mL 0.5% levobupivacaine plus 100-µg dexmedetomidine. There was significant decrease in mean arterial blood pressure in group LD100 compared to group LD50 and L group.

Additionally, a meta-analysis study by Ren *et al*.[13] included 20 randomized controlled trials in meta-analysis using dexmedetomidine (1µg/kg) as an adjuvant to local anesthetics in transversus abdominis plane block found that perineural dexmedetomidine increased the risk of bradycardia and hypotension, both of which were temporary and could be treated with atropine or ephedrine. Furthermore, research by Lin *et al*.[14] found that using 1 µg/kg of dexmedetomidine instead of 0.5 µg/kg resulted in greater bradycardia and hypotension. Therefore, 0.5 µg/kg of dexmedetomidine may lessen the unfavorable hemodynamic consequences. Additionally, Reddy *et al*.[15] observed significant bradycardia with perineural 0.5% levobupivacaine + 100-µg dexmedetomidine, which is consistent with our results. After supraclavicular brachial plexus block, Aksu *et al*.[16] observed a statistically significant decrease in heart rates and MAB in the group that received 15 mL of 0.33% bupivacaine and 1 µg/kg of dexmedetomidine as opposed to the group that received 30 mL of 0.33% bupivacaine. In a meta-analysis study, Hussain *et al*.[17] conducted a meta-analysis and found that more cases of intraoperative bradycardia occurred when the dose of dexmedetomidine was greater than 50 µg. However, when they compared cases of bradycardia with the control group, dexmedetomidine doses of less than 50 µg did not significantly differ. Swami *et al*.[18] also reported a significant reduction in hemodynamic parameters when dexmedetomidine was used at a dose of 1 µg/kg. This could be because alpha-2 subtype receptor activation by dexmedetomidine inhibits sympathetic outflow and norepinephrine release.

In contrast to our research, a prior study by Santosh and Mehandale[19] on sixty adults undergoing thyroid operations discovered that intra-operative mean arterial blood pressure and heart rate did not differ across the groups in a statistically or clinically meaningful way. Intervention for hypotension or bradycardia was not necessary. The dosage of dexmedetomidine administered to BSCPB was restricted to 0.5 µg/kg.

In the present inquiry, group BD100 experienced a considerably lower post-operative VAS than group BD50 and group B. Dexmedetomidine is a highly selective α2 adrenoreceptor agonist that has been demonstrated to produce both sedative and analgesic effects[19]. Ghazaly *et al*.[11] discovered the same thing when they evaluated the adjuvant effects of 50 and 100µg of dexmedetomidine in

infraclavicular brachial plexus block with levobupivacaine. Moreover, Kaur *et al*.'s study[20] of the supraclavicular brachial plexus block using dexmedetomidine as an adjuvant to levobupivacaine revealed a lower VAS in the dexmedetomidine group. Furthermore, Elmaddawy and Mazy[9] observed a markedly lower postoperative VAS in the dexmedetomidine group as compared to the control group when they examined the impact of adding dexmedetomidine to bupivacaine and epinephrine in ultrasound-guided bilateral superficial cervical plexus block for thyroid surgery.

In our study, higher doses of dexmedetomidine (100 µg) resulted in a noticeably longer period of postoperative analgesia. Compared to the BD50 and B groups, the BD100 group required smaller postoperative morphine dosages and a longer period for the first postoperative analgesic rescue.

Our findings corroborated those of studies by Ghazaly *et al*.[11], Bansal[21], Reddy *et al*.[12], Balakrishnan *et al*.[22], Keplinger *et al*.[23], and Zhang *et al*.[24], that added 100 µg dexmedetomidine to regional local anesthetics.

Trials that employed dexmedetomidine at a dose of 1 µg/kg as an adjuvant to LAs reported longer durations of analgesia and a decrease in the need for postoperative analgesics, as reported by Lin *et al*.[14].

A related meta-analysis by Hussain *et al*.[17] on 18 studies (n=1,092) revealed that adding dexmedetomidine to LAs lengthened analgesia and significantly decreased the need for postoperative analgesics when compared to the control group.

In our study, patient satisfaction after 12hr and 24hr were significant increase among group BD50 and group BD100 than group B. In this concern a study by Santosh and Mehandale,[19] who did their study on 60 adults, were randomised into two equal groups to receive BSCPB either with 20 ml 0.5% ropivacaine (Group A) or 20 ml 0.5% ropivacaine with 0.5 µg/kg dexmedetomidine (Group B) after induction of anaesthesia, they reported that, patient satisfaction in Group B was superior ($P < 0.001$) as the quality of analgesia was better when dexmedetomidine was used as an adjuvant.

On the other hand, compared to B group, fewer patients experienced nausea and vomiting in BD50 and BD100 groups. This was in line with Ghazaly *et al*.,[11] and Elmaddawy and Mazy,[9]. According to Jin *et al*.'s meta-analysis[26], which comprised 24 studies with 2046 patients, dexmedetomidine statistically decreased the incidence of PONV in adults and children when compared to placebo, irrespective of the manner of administration. Dexmedetomidine reduces noradrenergic activity by binding to the α2 presynaptic inhibitory adrenoreceptor in the locus coeruleus, this inhibition likely had an antiemetic effect[26].

This study was limited in a few ways. We did not assess the dexmedetomidine plasma levels and the study is a single-center investigation with a small sample size.

CONCLUSION

In comparison to the addition of 50 µg dexmedetomidine to bupivacaine and bupivacaine alone, the addition of 100 µg dexmedetomidine to bupivacaine increased the duration of postoperative analgesia of BSCPB and boosted the quality of analgesia, resulting in patients consumed fewer opioids, and being more satisfied after thyroid surgeries with controllable side effects. Furthermore, our research showed that bupivacaine plus dexmedetomidine may lower the incidence of PONV, the findings might offer additional proof to support dexmedetomidine's therapeutic utility beyond its usual use in sedation and analgesia.

CONFLICT OF INTERESTS

There are no conflicts of interest.

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