Original Article

Comparison between Preemptive Erector Spinae Plane Block Versus Serratus Anterior Plane Block on Postoperative Analgesia for Patients Undergoing Modified Radical Mastectomy: A Randomized Clinical Trial

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ABSTRACT

Background: Among the most commonly executed breast cancer surgical treatments, the modified radical mastectomy (MRM) is one of the most common. Significant discomfort is associated with MRM in the immediate postoperative phase.

The aim of The Work: Was to compare Ultrasound-guided Erector Spinae Plane Block (USG-ESPB) and Ultrasound Guided Serratus Anterior Plane Block (USG-SAPB) analgesic properties in MRM patients with axillary lymph nodes clearance.

Methods: This prospective, randomized, double-blind clinical trial was conducted on 70 female cases with breast cancer, their age ranging from 18 to 70 years, who were enrolled in MRM. Participants were equally distributed into 2 groups: group I was assigned USG-ESPB and group II was assigned USG-SAPB. Preoperative evaluation of every patient encompassed a comprehensive laboratory analysis, which included a complete blood count and renal function tests, in addition to a general examination.

Results: The time of the 1st need of rescue analgesic was significantly delayed in group I compared to group II (340.1 ± 14.84 min. vs. 274.7 ± 9.16 min., $P<0.001$). Group I had significantly lower total dose of tramadol compared to group II (83.3 ± 42.01 vs. 128.6 ± 28.64), ($P<0.001$). Group I had significantly lower percentage of patients requiring postoperative rescue analgesia compared to group II (51.43% vs. 80%, $P=0.023$).

Conclusions: Our analysis demonstrated that USG-ESPB offers prolonged analgesia, lower total dose of postoperative rescue analgesia, , reduced pain scores and diminished postoperative analgesic needs in patients undergoing unilateral MRM with axillary lymph nodes clearance surgery as opposed to USG-SAPB.

Key Words: Erector spinae plane block, modified radical mastectomy, postoperative analgesia, serratus anterior plane block.

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INTRODUCTION

The modified radical mastectomy (MRM) is a surgical procedure that is commonly performed in the treatment of breast cancer. Prolonged discomfort during the immediate postoperative phase is a significant complication of MRM[1]. Unmanaged acute postoperative pain may result in cardiac and pulmonary complications, extended stay in the post-anaesthesia care unit (PACU), adverse events related to opioid use, and increased surgical stress response[2].

Also, pain following a mastectomy may persist chronically in the form of postmastectomy pain syndrome (phantom breast pain, paraesthesia, and intercostobrachial neuralgia)[3]. The failure to adequately manage pain results in adverse physiological and psychological effects[4]. Administrating analgesics following MRM is challenging due to the extensive supply of nerves to the breast and the massive scope of the procedure[5]. MRM includes a range of regional or local nerve blocks to provide analgesia such as interscalene brachial plexus, erector spinae plane block (ESPB), paravertebral, pectoral, and thoracic epidurals[6-10]. Conversely, paravertebral blocks and thoracic epidurals are often considered unnecessary when performing a minimal invasive breast surgery due to the related complications[11].

By using of ultrasound guidance, Local anaesthetic was administered deeply into the erector spinae muscle plane during ESPB. This method blocks dorsal and ventral rami of spinal nerves effectively. Also, its technical simplicity minimizes complications and reduces the occurrence of

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hemodynamic adverse effects[12-14]. Comparable to other blocks, the Ultrasound-guided Erector Spinae Plane Block (USG-ESPB) gained significant attention owing to its unique characteristics, efficacy in analgesia, and minimal occurrence of complications[15].

Recent years have witnessed the emergence of an additional technique called ultrasound- guided serratus anterior plane block (USG-SAPB). The lateral branches of the intercostal nerves are inhibited with this method, which targets the plane in the midaxillary line either under or above the serratus anterior muscle. By using of ultrasound guidance, there is a smooth execution of the block and diminished probability of complications[16, 17].

Nevertheless, comparative research on the two blocks in cases undergoing breast cancer surgery is scarce. Our aim was to compare USG-ESP and USG-SAPB analgesic properties in MRM patients.

PATIENTS AND METHODS

We recruited 70 female patients (ASA I-II) who had a BMI 30 kg/m2 or less scheduled for MRM with axillary clearance for breast cancer to participate in our prospective, randomized, double-blind clinical trial. The ages of these patients spanned from 18 to 70. Prior to their enrollment, the patients were given an informed written consent to participate in the investigation.

ETHICAL CONSIDERATION

The research was carried out between February 22, 2023, and April 3, 2024 in adherence to the authorized protocols set forth by the Research Ethical Committee of Benha University Hospitals (Approval code: RC 23-11-2023) and registered on clinical trial (NCT06404918). The manuscript in its current form adheres to the CONSORT protocol.

Participants with pregnancy, a previous infection at the block location, psychiatric disorder, severe respiratory or cardiovascular disease, substance abuse, neurological or metabolic syndrome, preexisting liver disease, or prior infection at the site of the block, previous use of analgesics were excluded.

Randomization and blindness:

The cases were distributed into two equal groups at random, with a ratio of 1:1, using an opaque envelope containing a computer-generated list of random numbers. Group I (35 patients) received US ESPB, whereas Group II (35 patients) received USAPB. In this trial, both the patients and the care provider were blinded.

Preoperatively:

A comprehensive clinical assessment, including vital signs, a general examination of the abdomen, chest, and heart, and laboratory investigations including CBC and renal function tests, was conducted in conjunction with obtaining an extensive medical history from each patient.

Each patient was counselled on pain assessment during the preoperative consultation using the visual analogue scale (VAS) (0–0, 10–worst conceivable pain) and the categorical scoring system (CSS) for nausea (3–severe, 2–moderate, 1–mild, 0–none)[16, 17]. Premedication for all patients was administered on the day of the scheduled surgery, comprising tablets containing 0.25 mg of alprazolam and 10 mg of metoclopramide. This was done in accordance to the fasting guidelines, which strictly prohibited oral consumption for a period of 8 hours,

In the operating room, a 5-lead electrocardiogram, pulse oximetry, non-invasive blood pressure, and capnography were all connected to each patient. Despite having recorded all baseline parameters, the same standard surveillance was maintained throughout the intraoperative period. Randomization-based blocks were implemented in a fully aseptic environment before the surgical procedure commenced.

The anesthesiologist with experience in regional anaesthesia and familiarity with USG-ESPB and USG-SAPB, performed all the blocks and abstained from any further involvement in the management of the case before general anesthesia was initiated.

The execution of each block was carried out in strict adherence to aseptic protocols. Local anesthetic was deposited in the interfascial plane using an in-plane technique and a 22-gauge echogenic Quincke spinal needle (BD spinal needle, 22G, New Delhi, India) in conjunction

with the linear high frequency (6-15 MHz) ultrasound probe of the ultrasound machine (HFL38x; FUJIFILM SonoSite, Bothell, Washington). Block failure was declared operationally in case of absence of visual confirmation from the anesthesiologist concerning the location of the needle and the local anesthetic distribution in the proper interfacial plane[18].

Erector spinae plane group:

The block was done under complete aseptic conditions, full monitoring and 3 ml lidocain 1% at puncture site. The cases were positioned in lateral decubitus, with the surgical site oriented in an upward direction. The U/S probe was positioned 3 centimeters laterally to the T5 spinous process in a vertical orientation. An oval hyperechoic sonographic structure was identified as it traversed the transverse direction. In an in-plane trajectory, the needle was inserted into the erector spinae muscle until its point was positioned at a deep level. To ascertain the exact location of the needle, 3 mL of normal saline was injected and the spread beneath the erector spinae muscle was observed. Between the transverse process and erector spinae muscle. 0.4 mL kg-1 of bupivacaine of 0.25% concentration was injected. To evaluate the effectiveness of the blocks, the pinprick test was utilized. (Figure 1)

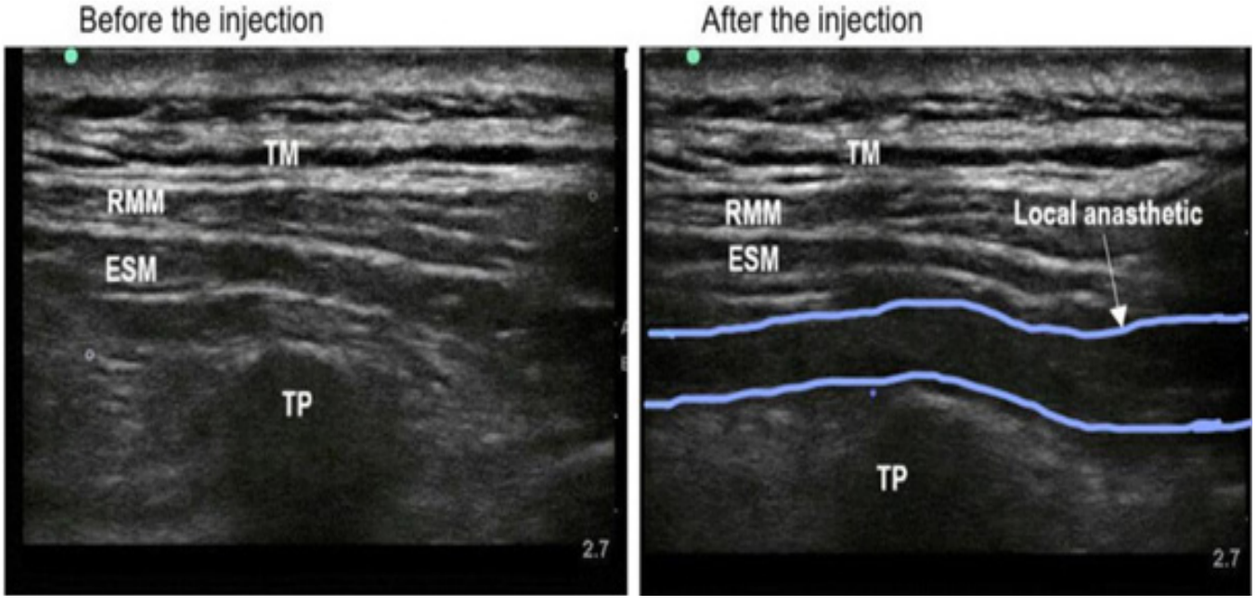

Fig. 1: Ultrasound imaging in the horizontal plane of the erector spinae planar block. RMM rhomboid muscle; TM trapezius muscle; ESM erector spinae muscle; TP T3 vertebral transverse processes.

Serratus anterior plane group:

The block was done under complete aseptic conditions, full monitoring and 3 ml lidocain 1% at puncture site. The patients were in supine position underwent a block of the SAP with the ipsilateral arm abducted to a 90° angle. Sagittarius-plane placement of a linear probe over the midclavicular region was performed in accordance with aseptic procedures. A posterior and lateral rib count was conducted until the midaxillary line was reached by the fifth rib. It was noted that the latissimus dorsi, serratus anterior, and teres major muscles were anterior to the fifth rib. The needle was inserted using an USG in-plane approach, which was maneuvered from caudal to cranial until the tip was positioned between the serratus anterior muscle and external intercostal muscle.

Following the in-plane insertion of the needle, 3 mL of normal saline was injected into the needle site for visual inspection of its distribution across the serratus anterior muscles in order to confirm the precise needle location, followed by advancing the syringe in an in-plane trajectory and injection of 0.4 mL kg-1 0.25% bupivacaine solution into the serratus anterior

muscle plane and to evaluate the effectiveness of the blocks, the pinprick test was utilized. (Figure 2)

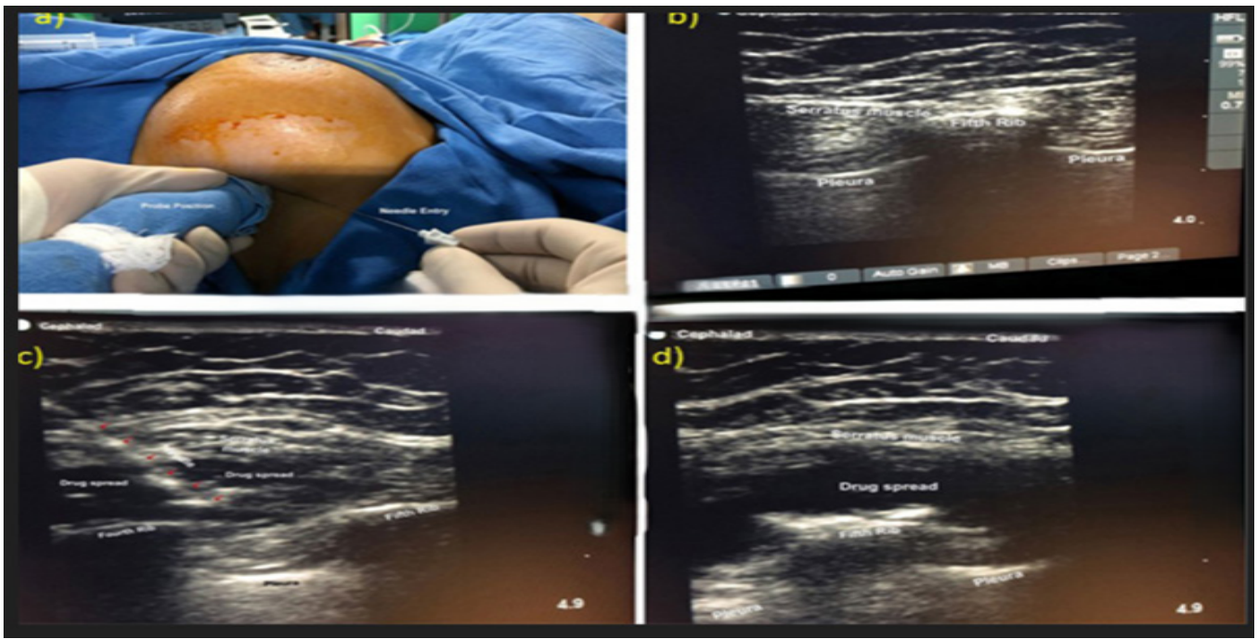

Fig. 2: Steps of SAPB in patient in supine.

Induction of general anesthesia:

After the blocks have been done, patients were turned supine position. IV premedications included fentanyl dose of 1 µg/kg and midazolam dose of 30 µg/kg for the patients; IV propofol dose of 2-2.5 mg/kg was administered to induce anesthesia. After administrating 0.15 mg/kg IV cisatracurium, endotracheal intubation was initiated. In order to sustain anesthesia, a mixture of air and oxygen (50/50) was supplemented with isoflurane (1–1.5%). During ventilation, adjustments were made to parameters in order to preserve end-tidal CO2 levels within the range of 35 to 45 mmHg. Following the operation, an IV infusion of 0.1 mg/kg of ondansetron was administered, along with the use of IV atropine and neostigmine to restore muscle relaxation. After tracheal extubation, the cases were transferred to the PACU where all patients stayed 2 hours. Measurements of haemodynamic data as Heart rate (HR) and Mean arterial pressure (MAP) were obtained intraoperatively at 30-minute intervals from the time the block until the conclusion of the operation, postoperatively at PACU at one and two hours and at surgical ward at four, eight, twelve, eighteen, and twenty-four hours.

Rescue fentanyl (0.5 µg/kg) was injected IV in response to a minimum 20% increase in HR or MAP from their respective baseline values. Rescue dose of intraoperative fentanyl given was recorded. A patient who presented with a mean ABP fall below 70 mmHg received a bolus of 250 mL of fluid and 6 mg of ephedrine intravenously. In cases where the HR fell below 60 beats/minute or decreased by 20% from its baseline value, 0.6 mg of IV atropine was administered.

As postoperative analgesics, ketorolac (0.5 mg/kg/ 8hr) and paracetamol (15 mg/kg/6hr) were administered to all patients. Pain was recorded via VAS during repose and arm abduction at PACU at one and two hours and at surgical ward at four, eight, twelve, eighteen and twenty four hours If the VAS > 3, IV administration of Tramadol 1 mg/kg (Tramal ampoule, 100 mg / 2ml, AdvaCare Pharma) was initiated as a first-line treatment. The cumulative dose of rescue analgesic required during the initial 24 hours as well as the time at which the initial dose was administered in the recovery room were both recorded.

At 24 hours postoperatively, patient satisfaction regarding postoperative analgesia was assessed using a 5-point Likert scale: 1 denoted extreme dissatisfaction and 5 represented extreme satisfaction[19]. Anesthesiologists who conducted the assessments were not engaged in the intraoperative management of patients or the administration of blocks.

The adverse effects of the two blocks were evaluated, including postoperative nausea and vomiting, pleural puncture or pneumothorax, hypotension, local anesthetic toxicity, and respiratory depression.

The primary outcome of our study was the time to the initial rescue analgesic dose postoperatively, the secondary outcomes were total dose of rescue analgesic (tramadol) needed within the initial twenty-four hours postoperatively, comparison between intraoperative and postoperative hemodynamic changes, the total number of cases necessitating rescue analgesia and, patients' satisfaction, pain scores using VAS at rest and arm abduction, and adverse effects of the two blocks[19].

Sample size:

The sample size calculation was performed using G. power 3.1.9.2 (Universität Kiel, Germany). The sample size was calculated according to the time of the 1st rescue analgesic requirement (our primary outcome), where the mean time (in hours) to the first morphine bolus in the postoperative period in the group E (ESB) was 9.57 ± 4.11 h, which was found to be statistically significant (p = 0.001) as compared to patients in the group S (SAP) where it was observed to be 6.46 ± 2.95 h., according to a previous study[17]. Based on the following considerations: 0.05 α error and 95% power of the study, allocation ration 1:1. Ten cases were added to overcome dropout. Therefore, 70 patients were allocated, 35 patients were in each group.

Statistical analysis:

SPSS v28 (IBM©, Armonk, NY, USA) was used for the statistical analysis[20]. the normality distribution of data was assessed using Shapiro-Wilks test and Histograms. In presenting the quantitative parametric data, the mean and standard deviation (SD) were utilized. The data that were obtained were subsequently analyzed utilizing the unpaired student t-test. Mann Whitney test was used to analyze the quantitative non-parametric data; the outcomes were presented as the median and interquartile range (IQR). The frequency and percentage (%) values of qualitative variables were utilized for analysis using Chi-square test or Fisher's exact test when appropriate. *P values* with two tails that were < 0.05 were regarded as indicators of statistical significance.

RESULTS

In this study, 107 patients were assessed for eligibility, 23 patients did not meet the criteria and 14 patients refused to participate in the study. The remaining 70 patients were randomly allocated into two groups (35 patients in each). All allocated patients were followed-up and analysed statistically. (Figure 3)

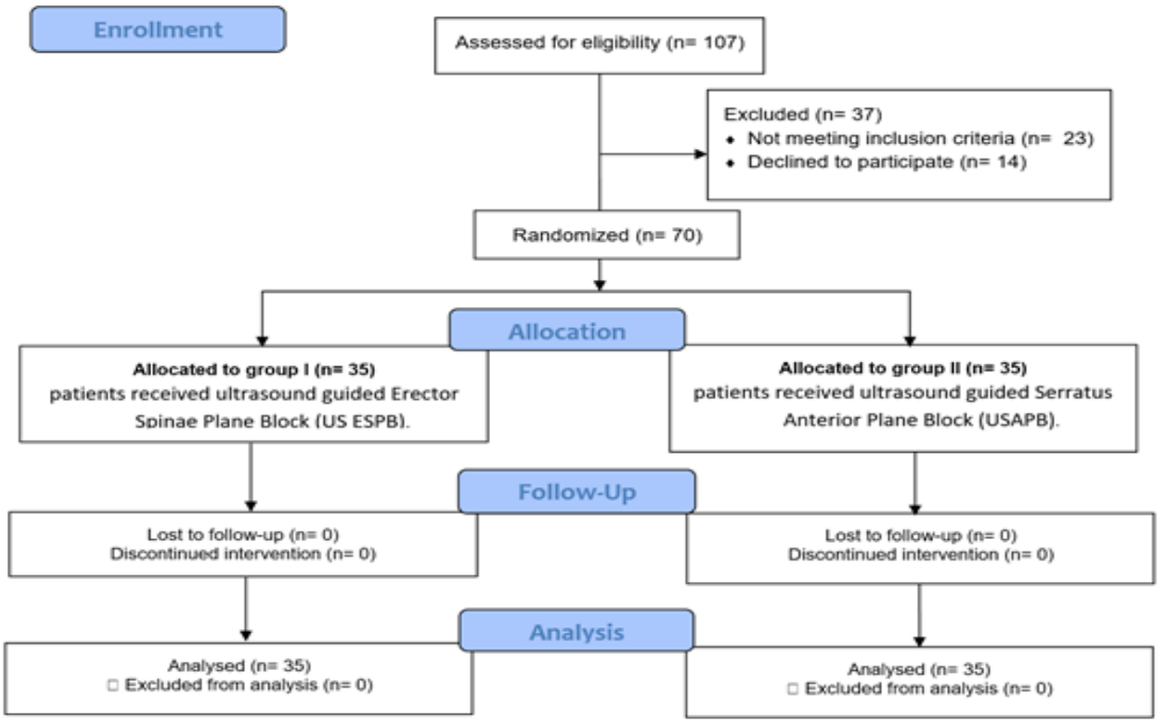

Fig. 3: CONSORT flowchart of the enrolled cases.

Insignificant differences were reported between the studied groups as regard the baseline characteristics (age, weight, height, BMI, and ASA) and duration of surgery. (Table 1)

Table 1: Baseline characteristics of the studied groups.

		Group I (*n*=35)	Group II (*n*=35)	*P value*
Age (years)		40.1 ± 9.81	37.3 ± 8.02	0.196
Weight (Kg)		67.9 ± 8.3	71.1 ± 8.95	0.125
Height (m)		1.7 ± 0.06	1.6 ± 0.06	0.710
BMI (Kg/m^2)		24.9 ± 3.6	26.2 ± 3.52	0.132
ASA	ASA I	14 (40%)	12 (34.29%)	0.621
	ASA II	21 (60%)	23 (65.71%)	
Duration of surgery (min)		121.7 ± 16.1	123.97 ± 13.61	0.518

Data presented as mean ± SD or number (%), ASA: American society of anaesthesiologists, BMI: body mass index.

Insignificant differences were reported as regard the intraoperative HR and MAP at all-time measurements (baseline, at 15, 30, 60, 90 min and at the conclusion of surgery) and total intraoperative fentanyl consumption between both groups. (Table 2)

Table 2: Intraoperative hemodynamic data and total intraoperative fentanyl consumption of the studied groups.

		Group I (*n*=35)	Group II (*n*=35)	*P value*
HR (beats/min)	Baseline	78.4 ± 5.94	78.7 ± 5.36	0.850
	15 min	79.7 ± 6.08	79.2 ± 5.55	0.698
	30 min	80.7 ± 6.19	79.9 ± 5.48	0.555
	60 min	80.1 ± 6.02	80.8 ± 5.33	0.587
	90 min	80.4 ± 5.83	81.9 ± 6.16	0.322
	End of surgery	80.5 ± 6.05	81.7 ± 6.13	0.413
MAP (mmHg)	Baseline	84.1 ± 7.07	81.6 ± 6.96	0.134
	15 min	82.3 ± 7.43	81.9 ± 6.56	0.812
	30 min	85.1 ± 7.05	82.6 ± 7.16	0.152
	60 min	82.2 ± 7.79	81.06 ± 6.95	0.509
	90 min	82.1 ± 7.89	81.01 ± 7.11	0.537
	End of surgery	83.1 ± 7.84	81.8 ± 7.14	0.456
Total intraoperative fentanyl consumption (µg)		135.9± 16.59	142.3 ± 17.9	0.125

Data presented as mean ± SD, HR: heart rate, MAP: mean arterial pressure.

VAS at rest and during arm abduction at 8, 12, and 18 hours was significantly lower in group I compared to group II (*P*<0.05); however, insignificant difference was reported between the two groups as regard VAS at rest and during arm abduction at PACU (at 1 and 2 hours), 4 and 24 hours. (Table 3)

Table 3: Visual analogue scale at rest and arm abduction of the studied groups.

		Group I (*n*=35)	Group II (*n*=35)	*P value*
VAS at rest	PACU at 1 hr	1 (0 - 2)	1 (0 - 2)	0.479
	PACU at 2 hr	1 (0 - 2)	1 (0 - 2)	0.861
	4h	1 (0 - 2)	1 (0 - 1)	0.457
	8h	1 (0 - 2)	3 (2 - 4)	<0.001*
	12h	3 (2 - 4)	4 (3 - 5)	0.001*
	18h	4 (3 - 5)	5 (3 - 5)	0.003*
	24h	3 (2 - 4.5)	4 (2 - 5)	0.284
VAS at arm abduction	PACU at 1 hr	2 (1 - 2.5)	2 (1 - 2.5)	0.429
	PACU at 2 hr	1 (1 - 2)	2 (0.5 - 2)	0.484
	4h	1 (1 - 2)	2 (1 - 2)	0.670
	8h	1 (1 - 2)	4 (3 - 4)	<0.001*
	12h	3 (3 - 4)	5 (3.5 - 5)	0.002*
	18h	4 (3 - 5)	4 (4 – 5.5)	0.003*
	24h	4 (3 - 5)	5 (3 – 5.5)	0.272

Data presented as median (IQR), PACU: post-anaesthesia care unit, VAS: visual analogue scale, *: statistically significant as *P value* <0.05.

Postoperative HR and MAP at 8, 12, and 18 hours were significantly lower in group I compared to group II (P0.05); however, insignificant difference was reported in postoperative HR and MAP between both groups at the post-anesthesia care unit (1 and 2 hours), 4 hours, and 24 hours. (Table 4)

Table 4: Postoperative hemodynamic data of the studied groups.

		Group I (*n*=35)	Group II (*n*=35)	*P value*
HR (beats/min)	PACU at 1 hr	83.0 ± 7.51	81.5 ± 7.41	0.408
	PACU at 2 hr	83.7 ± 7.66	82.7 ± 7.58	0.574
	4h	84.1 ± 7.68	82.9 ± 7.65	0.525
	8h	80.4 ± 5.83	84.7 ± 8.27	0.015*
	12h	84.6 ± 8.31	89.4 ± 9.56	0.027*
	18h	86.8 ± 8.96	92.4 ± 10.56	0.020*
	24h	88.1 ± 10.67	88.7 ± 9.79	0.789
MAP (mmHg)	PACU at 1 hr	82.4 ± 4.38	83.0 ± 5.17	0.585
	PACU at 2 hr	86.1 ± 6.2	83.2 ± 7.53	0.088
	4h	85.3 ± 6.23	83.3 ± 7.06	0.194
	8h	88.2 ± 7.22	92 ± 7.47	0.034*
	12h	88.9 ± 5.78	92.1 ± 6.04	0.023*
	18h	87.5 ± 10.02	92.3 ± 6.66	0.022*
	24h	91.9 ± 8.17	91.7 ± 6.05	0.895

Data presented as mean ± SD, HR: heart rate, MAP: mean arterial pressure, PACU: post-anaesthesia care unit, *: statistically significant as *P value* <0.05.

Group I experienced a significant delay in administering the first rescue analgesic (340.1 ± 14.84 min. vs. 274.7 ± 9.16 min., *P*<0.001). The need for postoperative rescue analgesics, group I administered a significantly lower total dose of tramadol than group II (83.3 ± 42.01mg vs. 128.6 ± 28.64 mg, *P*<0.001). In comparison to group II, the proportion of patients necessitating postoperative rescue analgesia was significantly diminished in group I (51.43% vs. 80%, *P*=0.023). (Table 5)

Table 5: Postoperative rescue analgesic requirement of the studied groups.

	Group I (*n*=35)	Group II (*n*=35)	*P value*
Time of the 1st rescue analgesic requirement postoperatively (min)	340.1 ± 14.84	274.7 ± 9.16	<0.001*
Patients requiring rescue analgesia postoperatively	18 (51.43%)	28 (80%)	0.023*
Total dose of tramadol (mg)	83.3 ± 42.01	128.6 ± 28.64	<0.001*

Data presented as mean ± SD or number (%), *: statistically significant as *P value* <0.05.

Insignificant difference was reported between the studied groups as regard satisfaction. (Table 6)

Table 6: Satisfaction of the studied groups.

	Group I (*n*=35)	Group II (*n*=35)	*P value*
Very dissatisfied	0 (0%)	0 (0%)	
Dissatisfied	1 (2.86%)	4 (11.43%)	
Neutral	7 (20%)	12 (34.29%)	0.206
Satisfied	19 (54.29%)	14 (40%)	
Very satisfied	8 (22.86%)	5 (14.29%)	

Data presented as number (%).

With respect to the negative consequences, hypotension manifested in a solitary patient (2.86%) of group I, whereas nausea and vomiting affected four (11.43%) of group I patients and three (8.57%) of group II patients. Patients in neither group experienced pneumothorax, respiratory depression, or local anesthetic toxicity, which are additional adverse effects. Hypotension and incidence of nausea and vomiting did not vary significantly between both groups. (Table 7)

Table 7: Adverse effects of the studied groups.

	Group I (*n*=35)	Group II (*n*=35)	*P value*
Hypotension	1 (2.86%)	0 (0%)	0.417
Nausea and vomiting	4 (11.43%)	3 (8.57%)	0.734
Pneumothorax	0 (0%)	0 (0%)	--
Respiratory depression	0 (0%)	0 (0%)	--
Local anaesthetic toxicity	0 (0%)	0 (0%)	--

Data presented as number (%).

DISCUSSION

Due to the introduction of interfacial nerve blocks a decade ago, pain relief following MRM has advanced significantly. introduction of interfascial nerve blocks that have shown promising results in terms of adequate analgesia, prevention of progression to chronic pain syndromes, and better quality of life indices and recovery scores following the surgical intervention[21].

Regional anaesthesia technique provides adequate analgesia, suppresses surgical stress response, reduces the requirement of opioids, and may prevent cancer recurrence[22, 23].

In superficial SAP block, the spread of local anaesthetic leads to disruption of axillary tissue planes, blockade of long thoracic and thoracodorsal nerves, difficulty in the identification and preservation of nerves intraoperatively, and needling through potential metastatic lymph nodes, increasing the chances of tumor seeding. The deep SAP block is technically easier and safer to perform as it uses the rib as the end point of postoperative analgesia and provides similar analgesia as superficial SAP block[24].

So, we preferred to use a deep SAP block in our study. Since its introduction by ***Forero et al.***[25], ESPB has been acclaimed as “magic bullet” for postoperative analgesia after thoracoabdominal surgeries[26].

In patients with MRM, we aimed to compare USG-SAPB and USG-ESPB analgesic efficacy.

Ahuja et al.[27] in their research comparing the efficacy of ESPB and USG-SAPB for postoperative analgesia following MMR, they discovered that the rescue dose and total intraoperative fentanyl dose were equivalent in both groups. There is a scarcity of research that has examined the application of ESPB to patients undergoing mastectomy after consuming lower doses of fentanyl[28, 29].

In contrast to group II, group I exhibited a notably diminished VAS during arm abduction and at rest at 8, 12, and 18 hours ($P< 0.05$). Nevertheless, no significant distinction was found with respect to VAS during arm abduction at the PACU (1 and 2 hours), 4 and 24 hours between both groups.

Similarly, two trials performed by ***Finnerty et al.***[30] and ***Gaballah et al.***[31] where ESPB was also shown to be a more effective analgesic than SAPB for patients undertaking minimally invasive thoracic surgery. As mentioned earlier, under both rest and movement, ESPB produced lower VAS scores than SAM block, providing more evidence in favor of our initial premise that ESPB is a more effective analgesic technique.

However, ***Ahuja et al.***[27] conducted a randomized clinical trial on 80 female patients undergoing MMR to compare USG-ESPB and USG-SAPB. Consistent with previous research, the results demonstrated that the median NRS at rest (with the exception of 0 minutes) and movement after surgery at all other time points was similar in the two groups[32-34].

In relation to the necessity for postoperative rescue analgesics, a statistically significant disparity was observed in the proportion of patients requiring analgesics between group I and group II (51.43% vs. 80%, P=0.023).

Sagar et al.[35] found significantly lower postoperative analgesic consumption in group Erector Spinae Plane Block. This is explicable by group ESPB ability to establish a prolonged and more effective blockage. Group ESPB demonstrated a diminished need for rescue analgesics when compared to group Serratus Anterior Plane Block. Another study suggests that thoracic paravertebral blocks and USG- ESPB have the following advantages over USG-SAPB: they prolong the duration of analgesia, reduce post-operative pain scores, and decrease the necessity to reassign analgesics within the initial twenty-four hours following surgery[36].

However, In ***Ahuja et al.***[27] study, in both groups, the number of cases who needed rescue analgesics (tramadol or diclofenac sodium) within the initial twenty-four hours following the procedure was similar. In addition, these findings were consistent with those of prior research[37, 38].

Group I administered a significantly lower total dose of tramadol than group II (83.3 ± 42.01 vs. 128.6 ± 28.64, P<0.001). A significant variation in the time required to administer the initial rescue analgesic was observed between group I and group II (340.1 ± 14.84 min vs. 274.7 ± 9.16 min, P<0.001).

Sagar et al.[35] demonstrated that the initial analgesic dose requirement for ESB was considerably prolonged (412.50±42.411min) than for SAPB (313.00±42.439min). ESB had significantly prolonged average duration of analgesia in comparison to SAPB (p<0.001). The ESPB group exhibited a significantly reduced total morphine consumption for rescue analgesia during the initial twenty-four hours, in comparison to the SAPB group.

USG SAPB and ESPB were effectively in patients undergoing MMR, according to another study. This was supported by decreased pain scores, extended duration of analgesia, and a reduced perioperative analgesic usage in SAPB in comparison to ESPB. ESPB administered a significantly higher volume of total rescue morphine in comparison to SAPB, notwithstanding the nearly equivalent VAS scores observed in both groups. The discrepancy in results may be ascribed to the differing volumes of the medication utilized in both groups (30 mL for SAPB and 20 mL for ESPB). Given that SAPB is a fascial block, it is expected that a larger quantity of local anesthetic will aid in its distribution throughout this operation. Furthermore, patients were promptly administered 1 g of paracetamol intravenously upon their arrival in the PACU; this process was replicated every 6 hours[39]. According to a previous meta-analysis, ESPB demonstrates superior analgesic efficacy in thoracic and breast surgery when compared to SAPB, with a specific focus on thoracic surgery[40].

However, there are several notable limitations that we should consider when interpreting the results. First, the relatively small sample size of may have masked the true treatment effect. Rare complications including pneumothorax or large vessel injury could not be assessed, and larger sample sizes could be required to analyse rare incidents.

The prospective utilization of ESPB and SAPB in the prevention of chronic postoperative pain is considerable[41, 42].

CONCLUSIONS

Our analysis revealed that USG-ESPB provides long duration of postoperative analgesia, lower total dose of analgesia, decreased postoperative analgesic needs and lower pain scores in patients with unilateral MRM surgery as compared to USAPB. Additionally, USG-ESPB may be a better treatment for postoperative pain during thoracic and breast surgery in the future and can be used as an alternative to USAPB. Before offering an assessment of the efficacy of the continuous catheter technique for block placement, further investigation is necessary. Moreover, to oversee the follow-up concerning the enduring ramifications of the onset of chronic pain.

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CONFLICT OF INTERESTS

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PRESENTATION AT A MEETING

No

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المقارنة بين حظر الأعصاب الاستباقي في مستوى العضلة الشوكية مقابل حظر الأعصاب في مستوى العضلة المنشارية الأمامية في مسكنات الألم ما بعد الجراحة للمرضى الذين يخضعون لاستئصال الثدي الجذري المعدل: تجربة سريرية عشوائية

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الخلفية: من بين أكثر العلاجات الجراحية شيوعًا لسرطان الثدي، يُعد الاستئصال الجذري المعدل (MRM) من الأكثر شيوعًا. يرتبط الاستئصال الجذري المعدل بعدد من الآلام والانزعاجات الكبيرة في المرحلة ما بعد الجراحة مباشرة. هدفنا كان مقارنة خصائص المسكنات للألم باستخدام حظر الأعصاب في مستوى العضلة الشوكية الموجه بواسطة الموجات فوق الصوتية (USG-ESPB) وحظر الأعصاب في مستوى العضلة المنشارية الأمامية الموجه بواسطة الموجات فوق الصوتية (USG-SAPB) لدى المرضى الذين خضعوا للاستئصال الجذري المعدل.

الطريقة: أجريت هذه التجربة السريرية العشوائية المزدوجة التعمية على ٧٠ حالة من النساء المصابات بسرطان الثدي تتراوح أعمارهن بين ١٨ إلى ٧٠ عامًا، واللواتي خضعن للاستئصال الجذري المعدل. تم تقسيم المشاركين بشكل عشوائي إلى مجموعتين: المجموعة الأولى خضعت لـ USG-ESPB والمجموعة الثانية خضعت لـ USG-SAPB. تضمن التقييم ما قبل الجراحة لكل مريضة تحليلًا شاملاً للتحاليل المخبرية، بما في ذلك تحليل صورة الدم الكامل واختبارات وظائف الكلى، بالإضافة إلى فحص عام.

النتائج: تم تأخير وقت الحاجة الأولى للمسكنات في غرفة الإنعاش بشكل ملحوظ في المجموعة الأولى مقارنة بالمجموعة الثانية (340.1 ± 14.84 دقيقة مقابل 274.7 ± 9.16 دقيقة، $P<0.001$). كانت نسبة المرضى الذين احتاجوا إلى مسكنات ألم بعد الجراحة أقل بشكل ملحوظ في المجموعة الأولى مقارنة بالمجموعة الثانية (51.43% مقابل 80%، $P=0.023$). كانت الجرعة الإجمالية للترامادول أقل بشكل ملحوظ في المجموعة الأولى مقارنة بالمجموعة الثانية (83.3 ± 42.01 مقابل 128.6 ± 28.64)، ($P<0.001$).

الاستنتاجات: أظهرت تحليلاتنا أن USG-ESPB يوفر مسكنًا طويل الأمد للألم، ويقلل من درجات الألم، ويقلل من الحاجة إلى مسكنات الألم بعد الجراحة لدى المرضى الذين خضعوا لجراحة الاستئصال الجذري المعدل أحادي الجنب، مقارنة بـ USG-SAPB. علاوة على ذلك، قد يثبت أن USG-ESPB هو البديل الأكثر تفضيلًا لـ USG-SAPB في المستقبل.